

# Bearing NEWS

BEARING INDUSTRY MAGAZINE

2022

SEPTEMBER  
ISSUE 36

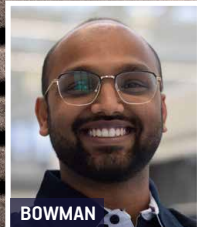
## 3D Printing is Transforming How We Think About **Bearing Cage Design**



FENNER  
MICHAEL J. KNIGHT



RKB  
ALBERTO BARILI



BOWMAN  
RAIMOND BREUKER

**When a standard bearing  
won't do the job...**



**...try our bearings for harsh environments.**

We keep a large stock of full ceramic bearings, marine grade 316 stainless steel bearings and plastic bearings to cope with highly corrosive environments, extremes of temperature and applications involving magnetic fields.

Full ceramic bearings can be used from -200C to +800C depending on the bearing material. They can be used without lubrication in the presence of highly aggressive chemicals and are non-magnetic.

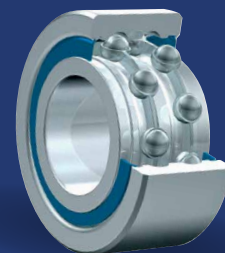
316 stainless steel bearings and plastic bearings are used in low load/speed applications that are too corrosive for the standard 440 grade stainless steel. Plastic is non-magnetic and 316 stainless steel has a negligible response to magnetic fields.

For an overview of the benefits of these different bearing types, visit our website at [smbbearings.com/downloads](http://smbbearings.com/downloads) and see our "Bearings for Harsh Environments" brochure. Alternatively, ask us to mail you a copy.

**SMB**  
**BEARINGS**

+44 1993 842555  
[sales@smbbearings.com](mailto:sales@smbbearings.com)  
[www.smbbearings.com](http://www.smbbearings.com)

**ZEN™**



ZEN LR Track Rollers are the perfect design solution for applications such as cam controls, transportation systems and all types of sliding applications.

# **ZEN™ LR Track Rollers**

Series LR2, LR50, LR52, LR53 and LR6.

[sales.uk@zen.biz](mailto:sales.uk@zen.biz) or +44 (0) 1227 793 334

**ZEN™**

BEARINGS FOR YOUR FUTURE



**ZEN™**

BEARINGS FOR YOUR FUTURE



In our industry, the highest standard we can achieve for our Quality Management System is the ISO 9001 certification - awarded by TUV Rheinland. It is the global benchmark that guarantees a total focus on customer service and continual improvement.







[www.zen.biz](http://www.zen.biz)

## Publisher iMotion Media

Louizalaan 523,  
1050 Brussels - BELGIUM

Phone : +32 (0)489 32 85 21  
Fax : +32 (0)3 303 52 82  
E-mail : [info@bearing-news.com](mailto:info@bearing-news.com)  
Web : [www.bearing-news.com](http://www.bearing-news.com)

 : [linkedin.com/company/bearingnews](https://www.linkedin.com/company/bearingnews)  
 : [facebook.com/BearingNewscom](https://www.facebook.com/BearingNewscom)  
 : [twitter.com/Bearing\\_News](https://twitter.com/Bearing_News)  
 : [youtube.com/channel/UCbCnbcjmjFPbLEkLZGdjEXIw](https://www.youtube.com/channel/UCbCnbcjmjFPbLEkLZGdjEXIw)

The information contained in this magazine is for general purposes only. The information is provided by BearingNews. We make no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, suitability or availability. Any reliance you place on such information is therefore strictly at your own risk. In no event will we be liable for any loss or damage including without limitation, indirect or consequential loss or damage, or any loss or damage whatsoever arising from loss of data or profits arising out of, or in connection with, the use of this magazine.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or printed, without permission in writing from the publisher/editor.

The BearingNEWS is  
a member of the EPTDA



## The Bearing Industry Goes GREEN!

This new edition of BearingNews Magazine highlights the industry's progressive movement towards greater sustainability. Read how more and more companies are embracing environmentally friendly solutions for a greener future.

For us at Bearing News, we will move to use recycled paper in conjunction with a tree planting campaigns to neutralize the carbon footprint of each printed edition. While NSK is focusing on its "ocean harvesting – wave power" project to test a new type of renewable energy and has developed the world's first 100% bioplastic bearing cage. Thyssenkrupp rothe erde starts CO2-free production of Bearing Rings and SKF deepens the "smarter second life" program for industrial bearings.

Further in this issue, BearingNews is proud to bring readers a series of qualitative interviews. Through the words of Mr. Michael J. Knight (Senior Product Manager, Technical Textiles), Fenner Precision Polymers unveils 'Fenlon Asta,' a revolutionary new bearing liner for higher bearing performance. Next, Charan Prakash, Applications Engineer for Bowman's Additive Production Division, explains how production 3D

printing is transforming how we think about bearing cage design. Last, but certainly not least, enjoy a Q&A Session with Dr. Eng. Alberto Barili of the RKB Technical Team to understand the innovations necessary to produce Pin-Type Cages for Large-Sized Bearings.

## What's Rolling..

What's Rolling in the Bearing Industry. See what has happened in the last 6 months, learn details about key companies and trends, announcements, product developments, and other news worthy advancements. All this and more can be found in this September issue of BearingNews Magazine.

I hope that you will enjoy it!

**Kenan M. Özcan**  
Editor in Chief



The BearingNEWS magazine is published **four times a year in March, June, September and December.**

The online editions are published in **8 languages** and can be followed on **[www.bearing-news.com](http://www.bearing-news.com)**

### Art Director

Diyyem Deniz Koç

### Photography & Illustrations

Ksenia Shamanaeva

### Web & IT

Canbey Bilgili  
Birsan Aydın  
Onur Uz

### Subscriptions

[info@bearing-news.com](mailto:info@bearing-news.com)

### Editor-in-Chief

Kenan M. Özcan

### Editorial Team

Thomas Johnson  
Mia Mctigue Rodriguez  
Dize Purde

### Guest Editor

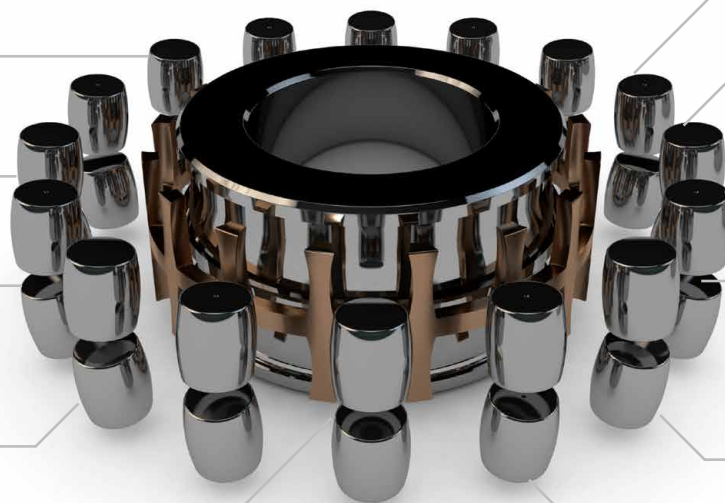
Mike Brandt

### Marketing

Tapaswee Dixit  
Victor Vialat  
Vincent Yang

### Project Coordinator

Merve Zhunuskanova



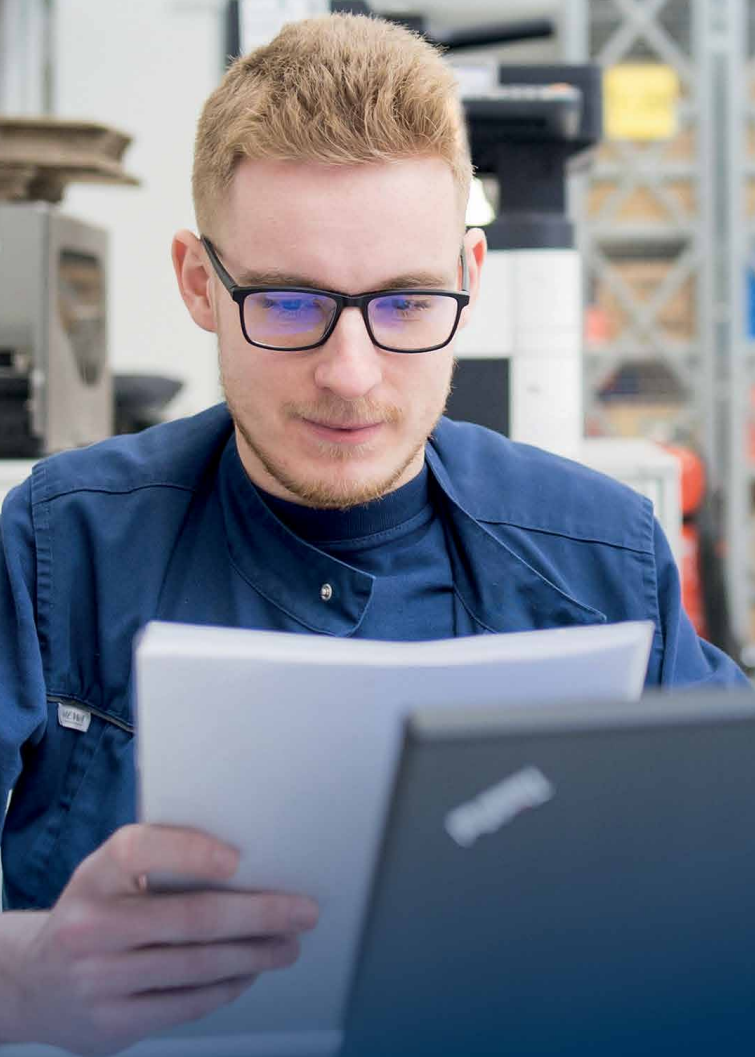
## Related Publications & Network

## Media & Organization Partners



# ALWAYS IN MOTION.

1922 • 2022 • 2122



50,000 +  
items in stock



Bearings from every  
premium brand



Linear technology  
made to order



Ordered today.  
Sent today.



Only at PICARD:  
[shop.picard.de](http://shop.picard.de)

GET MORE.

**PICARD**  **100**

# What's Rolling...

## What's Rolling in the Bearing Industry



page

13

### TECHNOLOGY:

REVOLUTIONARY SLEWING BEARING & DRIVE SYSTEM  
FOR WIND-ASSISTED PROPULSION



page

27

### CONDITION MONITORING:

ULTRASOUND... A JACK OF ALL TRADES THE SWISS ARMY  
KNIFE OF CONDITION MONITORING



page

30

### INTERVIEW:

RKB PIN-TYPE CAGES FOR LARGE-SIZED BEARINGS-  
Q&A SESSION WITH DR. ENG. ALBERTO BARILI



page

32

### CASE STUDY:

A SMARTER SECOND LIFE FOR INDUSTRIAL BEARINGS



page

36

### COMPANY:

FROM NBI TO GRUPO NBI...  
THIS IS THE STORY OF THE NBI BEARING BRAND



page

42

### INTERVIEW:

FENLON ASTA™, THE REVOLUTIONARY TECHNOLOGY  
FOR HIGHER BEARING PERFORMANCE



page

44

### INTERVIEW:

IS PRODUCTION VOLUME 3D PRINTING TRANSFORMING  
HOW WE THINK ABOUT BEARING CAGE DESIGN?



page

50

### SOLUTION:

SIMPLE, FAST AND SAFE BEARING HANDLING  
THANKS TO SIMATOOL



page

55

# lling...

**COMPANY:**  
OUTER SPACE-  
THE ULTIMATE TEST OF HIGH QUALITY BEARINGS



page

61

**SUSTAINABILITY:**  
THYSSENKRUPP ROTH ERDE STARTS CO<sub>2</sub>-FREE  
PRODUCTION OF BEARING RINGS



page

65

**SUSTAINABILITY:**  
NSK TEAM STORIES: WORLD'S FIRST 100% BIOPLASTIC BEARING CAGE  
SUPPORTING CARBON NEUTRALITY WITH ECO FRIENDLY PRODUCTS



page

67

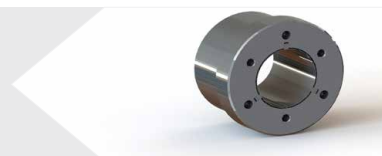
**LUBRICATION:**  
WHEN BEARING RELUBRICATION IS NOT A DIY JOB THE  
TECHNOLOGICAL SECRETS OF RELUBRICATION FACILITIES



page

70

**TECHNOLOGY:**  
INSIGHTS ON OAV AIR BEARINGS FOR  
HIGH-SPEED-HIGH-TEMPERATURE TURBOMACHINERY



page

73

**MARKET:**  
ICT EXPANDS ITS BEARING INDUSTRY OPERATIONS TO  
NORTH AMERICA



page

75

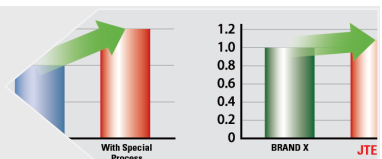
**COMPANY:**  
THE ZEN GROUP RENAMES ITS EUROPEAN BRANCHES



page

77

**APPLICATION:**  
ONI BEARING -  
BEARINGS FOR THE WHEEL OF RACE BICYCLES



page

80

**CONDITION MONITORING:**  
PREVENTING DAMAGE AND REDUCING COSTS WITH  
SENSOR BEARINGS



page

83

# What's Rolling...

## **LUBRICATION:**

MANUAL OR AUTOMATIC LUBRICATION? HOW TO DECIDE



page

84

## **BEARING STEEL:**

FROM THE "CRADLE" OF CHINESE IRON & STEEL INDUSTRY TO  
A DIVERSIFIED SOLUTION PROVIDER FOR HIGH QUALITY BEARING STEEL



page

89

## **PRODUCTION:**

HIGHER WEAR RESISTANCE AND LONGER TOOL LIFE IN HARD TURNING  
APPLICATIONS UP TO 58 HRC WITH KENNAMETAL'S KYHK15B™ GRADE



page

93

## **APPLICATION:**

TIMKEN PROVIDING BEARINGS FOR GE'S HALIADE-X,  
THE WORLD'S MOST POWERFUL OFFSHORE WIND TURBINE



page

95

## **MANAGEMENT:**

HOW TO SUPPORT CHANGE MANAGEMENT IN COMPANIES



page

99

## **APPLICATION:**

SCHAEFFLER OFFERS SUSTAINABLE SOLUTIONS  
FOR THE FOOD AND PACKAGING INDUSTRY



page

100

## **SUSTAINABILITY:**

WAVE POWER – USING NSK BALL SCREWS



page

103

## **APPLICATION:**

FRICTION BEARING UNIVERSAL JOINTS  
FOR PACKAGING APPLICATIONS

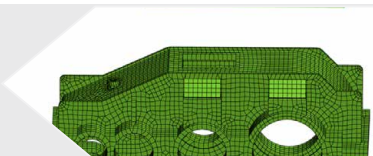


page

105

## **SOFTWARE:**

MESYS SOFTWARE VERSION 06/2022 IS AVAILABLE



page

106

## **SUSTAINABILITY:**

BEARING NEWS GOES GREEN



page

108

# Bearing NEWS

will be celebrating its  
**10th anniversary in 2023!**



The image features a collage of Bearing News magazine covers. On the left, three covers are shown in a fan-like arrangement, partially overlapping. In the center, a full cover of the 2023 Special Edition (Issue 37) is displayed. The cover has a red header with the website 'www.bearing-news.com', the title 'Bearing NEWS' in large white letters, and the subtitle 'BEARING INDUSTRY MAGAZINE' in smaller white letters. To the right of the main cover, a small black box contains the text '2023 Special Edition ISSUE 37'. Below the main cover, a large graphic of the number '10' is formed by a collage of various magazine covers. The '1' is a vertical strip of covers, and the '0' is a circular collage of covers. Below the '10' is the word 'YEARS' in large, bold, block letters, each letter also composed of a collage of magazine covers. At the bottom of the '10 YEARS' graphic is the word 'Bearing News' in a stylized font, with each letter of 'Bearing' and 'News' also being a collage of magazine covers.

www.bearing-news.com

**Bearing NEWS**

BEARING INDUSTRY MAGAZINE

2023  
Special Edition  
ISSUE 37

P918438 - 2023/01

*We would love to share this momentum with all the readers and community with a special edition, where a snapshot of the global bearing industry will be shared and distributed all year long during 2023.*



Would you like to highlight your company solutions and brand for an all-year?

Reserve your spot at  
[info@bearing-news.com](mailto:info@bearing-news.com)

Designed for the future of safety.  
Performance for a longer life.



[crossocean.com](http://crossocean.com)

COC INC.



*New Spherical Roller Bearing Units  
& New Stainless Ball Bearing Units  
with innovative new designs  
from JAPAN*







**BEARINGS**



**BELTS &  
PULLEYS**



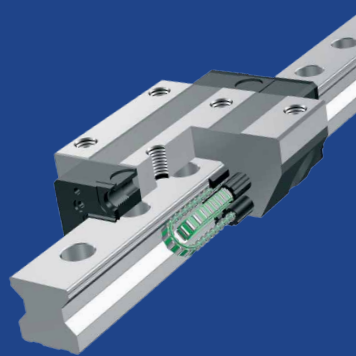
**CHAINS &  
SPROCKETS**



**COUPLINGS**



**MOTORS &  
GEARBOXES**



**LINEAR  
SYSTEMS**



**LUBRICATION**



**MAINTENANCE  
PRODUCTS**

# NOT JUST BEARINGS...

Same day despatch on over 6 million  
MRO products



[www.acornexpress.co.uk](http://www.acornexpress.co.uk)

**acorn**<sup>®</sup>  
industrial services limited



— Photo credit: Ontario Power Generation

**March 09, 2022** // Michell Bearings has secured an order from ANDRITZ Hydro Canada to provide three sets of PTFE thrust pads for the Sir Adam Beck I hydropower station. Situated close to Niagara Falls and operated by Ontario Power Generation (OPG), the station diverts water from the Niagara and Welland rivers which is then released into the lower portion of the Niagara River. As part of a progressive upgrade programme, Michell Bearings is contracted to supply PTFE thrust pads replacing the current Babbitt solution within two historic turbine generator units. The PTFE material provides a greater safety factor when compared with the Babbitt alternative. PTFE is more durable and has a well-established and proven track record within the hydropower sector, increasing the life of the bearing by providing greater reliability.

**March 15, 2022** // FLT Polska expands production base after acquisition by XCC Group, one of China's most technological bearing manufacturers. The acquisition is starting a new era for the FLT brand bearings. FLT Polska has been operating in the bearings market since the 1950s –

at the beginning as a part of Impexmetal company and since 1999 as a separate company named Impex-Lozyska. In 2007 the name changed to FLT Polska. FLT POLSKA GROUP consists of foreign companies operating for many years in Great Britain, France, Germany, Italy, USA and China in bearings and bearing parts sector. XCC Group has strong bearing manufacturing capacity as biggest bearing rings supplier for SKF and Schaeffler. After FLT joined XCC Group family, FLT Polska will extend its service range for customers thanks to XCC Group's production and R&D base.



**March 20, 2022** // Bearing specialist NKE Austria GmbH has a new Managing Director: Matthias Ortner, previously the Deputy Managing Director, was appointed Managing Director of the Steyr-based bearing manufacturer with effect from 2022. Ortner joined NKE in 2018 as Director

of Finance, gained further experience as HR Director and Head of Supply Chain Management, and since October 2020 he has served as Deputy Managing Director. He has a Bachelor's degree in Business and Management from the Management Center Innsbruck, a Master's degree in Controlling, Accounting and Finance from the FH Oberösterreich and completed an advanced course in Digital Transformation at Stanford University in the USA. After his studies, he worked as a business consultant for Ernst & Young.



— Matthias Ortner,  
Managing Director at NKE Austria GmbH

**April 01, 2022** // JTEKT Corporation rebranding Koyo Bearings to JTEKT Bearings. For the Bearing business this means that the Koyo brand will be replaced by the JTEKT brand, as of our next fiscal year, starting on April 1, 2022. The company informed that this is only a change of brand? The company, its general structure, the products and services will remain the same. Customers can rely on the continued good service and quality of products in the future.

	Before	On April 1, 2022: unification
Group identity	<b>JTEKT</b>	<b>JTEKT</b>
Brand for automotive components	<b>JTEKT</b>	
Brand for bearing	<b>Koyo</b>	
Brand for machine tools	<b>TOYODA Koyo</b>	





**April 05, 2022** // Fersa Group officially announces the purchase of 100 percent of the North American company PFI Group, Inc., parent company of Perfect Fit Industries (PFI Bearings). With the acquisition, the Spanish multinational bearings specialist Fersa aims to strengthen its global distribution strategy in the light automotive aftermarket and to diversify its product range. PFI Bearings is based in Florida, USA, and was founded more than 25 years ago. The company's focus is on automotive aftermarket bearings for light duty vehicles. In this sector, PFI has a strong reputation and recognition. The products are designed in the USA. With a workforce of 70 employees, PFI had a turnover of 16.8 million US dollars in 2021. The products are distributed in more than 70 countries, with own distribution centers in Argentina, Australia, Bolivia, Brazil, Chile, Colombia, the Netherlands, Mexico, China and Turkey. Fersa Group is a multinational company based in Zaragoza, Spain, specializing in the design, manufacture and distribution of high-performance bearings for the OEM, Tier 1 and aftermarket sectors of automotive, industrial and energy applications. With a global workforce of 600 employees, Fersa Group supports and services customers in more than 100 countries with four production centers, 16 distribution centers and three R&D centers on five continents.

**April 11, 2022** // Solve Industrial Motion Group Acquires SST Bearing Corporation. The acquisition of SST Bearings further enhances Solve's portfolio of bearings and power transmission offerings, expands its portfolio of product offerings, and strengthens its supply chain to better serve its customers, particularly

original equipment manufacturers. Headquartered in Loveland, Ohio, SST Bearings was founded in 1957, and offers a wide selection of radial bearings, mounted ball bearings and inserts, power transmission products, castings, and custom assemblies. The acquisition also includes conveyor components company, USA Rollers, Inc. Solve was established in 2020 to serve as a one-stop resource for both metric and American standard power transmission products through its platform of brands including P.T. International, IPTCI Bearings, and LMS Bearings. Solve continues to grow this portfolio with its second acquisition in three months, having acquired Bearings Limited, which manufactures the Tritan brand, in December 2021. Based in Charlotte, North Carolina, Solve currently operates 11 facilities across the United States. SST Bearings adds to Solve's presence across multiple verticals, including food and beverage, material handling equipment, agriculture, automotive manufacturing, textiles, mining, and pharmaceuticals.



**April 15, 2022** // Michell Bearings has announced the opening of a U.S. sales and engineering office in Fort Washington, Philadelphia. The office opening follows the incorporation of the U.S. business, Michell Bearings Inc.,



in 2021 to better support customers in North America, especially those in the U.S. naval industry. The new office will be responsible for managing customer relationships with all existing and potential Michell Bearings customers in North America. All North American tendering activity will be managed from the Fort Washington office which will allow Michell Bearings to engage earlier on projects than in the past and be easier to deal with for our customers. Activities in Fort Washington will involve U.S. supply chain management and supporting the existing manufacturing and assembly facility located in Sioux Falls, South Dakota. Opened last year as part of the incorporation, the facility supports contracts where U.S. manufacturing content is required.

**April 21, 2022** // Mondial Group Expands Asia Operations. Mondial Group Asia Limited is a Korean company belonging to Italy's Mondial Group, which manufactures and distributes innovative and high-quality power transmission components worldwide. To mark its 75th anniversary in October '21, Mondial Group established a new company in Daegu,

# JTEKT

Japanese origin & quality – trusted worldwide since 1921

# Bearings for extreme environments



Get to know our bearings at [www.koyo.eu](http://www.koyo.eu)

Formerly sold as **Koyo**



# ***GODIVA BEARINGS***

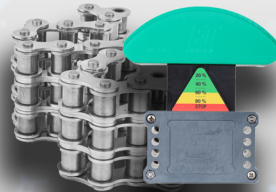
***WE DO MORE THAN JUST BEARINGS...***

Our product range expands over 40 manufacturers with over £10 million's worth of stocks available on our shelves at our NDC in Dudley.

***V-BELTS &  
TIMING BELTS***



***CHAINS & CHAIN TENSIONERS***



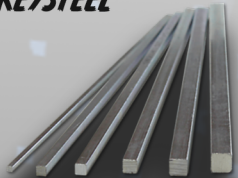
***DISC SPRINGS***



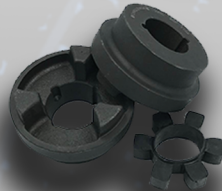
***WAVE WASHERS***



***KEYSTEEL***



***COUPLINGS***



***BEARING HEATERS***

***PNEUMATICS***



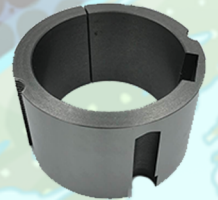
***ADHESIVES &  
LUBRICANTS***



***SEALS, O-RINGS  
& VEE RINGS***



***OIL & WRAPPED  
BUSHES***



***TAPERLOCK BUSHES***

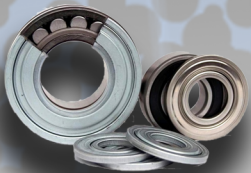
***SPROCKETS***



***PULLEYS***



***NILOS RINGS***



***FITTINGS & REMOVAL TOOLS***



***LOCKING COLLARS***



Bearing accessories and additional products are readily available to be shipped out the same day you order! We can even send directly to YOUR customers in plain packaging, keeping our trade only promise!

[dudley@godiva-bearings.co.uk](mailto:dudley@godiva-bearings.co.uk)

+44 (0) 1384 240 005

[newcastle@godiva-bearings.co.uk](mailto:newcastle@godiva-bearings.co.uk)

+44 (0) 191 272 5225



***WWW.GODIVA-BEARINGS.CO.UK***

South Korea, to source promising Asian products and promote its own products in the Asian market. Currently, Mondial Group Asia is organizing a sales network for Unitec, a manufacturer of special cylindrical roller bearings belonging to Mondial Group. Unitec bearings have been well received by European machine tool and industrial machinery manufacturers for more than 40 years through excellent quality and service. In the early days of COVID-19, European manufacturers suffered from industrial restructuring due to a sharp drop in local demand and sales. Despite the challenging situation, thanks to continuous investments in the company and through the development of customized solutions and excellent service, Mondial Group succeeded in retaining customers and its market position.



**April 26, 2022** // SKF Plain Bearings used in World's Longest Suspension Bridge. SKF performed extensive testing and qualification to show that its plain bearings were suitable for use on the 4 km-wide bridge in Turkey. Bearings from SKF are playing a key role in a record-breaking engineering project – the world's longest suspension bridge, which recently opened in Turkey. The 1915 Çanakkale Bridge spans a distance of more than 4 km across the Dardanelles strait in the north-west of the country. It forms part of a larger road construction project worth more than €3 billion. In total, SKF supplied more than 340 plain bearings for the bridge. The plain bearings that were produced in Schweinfurt, Germany are located at the top and bottom of the bridge's

vertical suspender cables. They help to transfer extensive loads from the bridge's two main cables and its deck. At the same time, they accommodate radial, axial and diagonal micro-movements that occur between the bridge and its supporting cables. As well as being able to carry high loads, the bearings must be corrosion-resistant due to the bridge's coastal location. After carrying out salt-spray tests in its laboratory in Schweinfurt, SKF supplied bearings that were protected with a special surface coating technology. The 1915 Çanakkale Bridge uses 226.000 m<sup>3</sup> of concrete, and 162.000 kilometres of steel wires, enough to flip the world four times.

**TIMKEN**

**SPINEA**  
EXCELLENCE IN MOTION

**April 29, 2022** // The Timken Company, a global industrial leader in engineered bearings and power transmission products, has reached an agreement to acquire Spinea, s.r.o. (Spinea), a European technology leader and

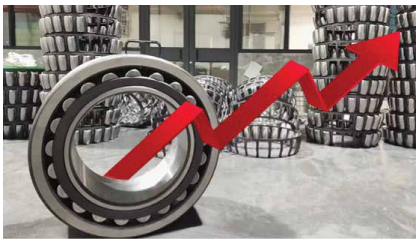


manufacturer of highly engineered cycloidal reduction gears and actuators. Spinea's solutions primarily serve high-precision automation and robotics applications in the factory automation sector. Spinea sales are expected to be around \$40 million for the full year 2022. In recent years, Timken has diversified its portfolio by expanding its power transmission products and services. This includes the acquisitions of both Rollon and Cone Drive, which deliver next-generation technologies for robotics and automation applications. Spinea complements Cone Drive's precision gearing business and further advances the company's product offering and commitment to customer-centric innovation. Spinea will further scale Timken's position in automation, which was the company's second-largest market after renewable energy in 2021. Privately owned and operated since its founding in 1994, Spinea is located in Presov, Slovakia. The transaction, which is subject to customary closing conditions, is expected to close over the next several weeks and will be funded with cash on hand and borrowings from credit facilities.

**May 10, 2022** // 9,960 Counterfeit Bearings Seized in Hangzhou. The Zhoushan customs department in



Hangzhou, China found counterfeit FAG bearings during a routine control on 10 May 2022. A shipment of good, declared as unbranded bearings attracted the attention of the inspectors. After unpacking and inspection, it was clear that the exported goods were indeed large and smaller size bearings, but their trademark labels were not “unbranded” as mentioned in the export declaration. After the inspection, the custom recorded 9,960 bearings of various types which were suspected of being counterfeited. Subsequently, the right holder, Schaeffler Technology Co., Ltd. confirmed that the goods infringed its exclusive right to use the trademark, and filed an application with the customs for taking intellectual property protection measures. This is the largest case of infringing machine spare parts seized by the Customs this year. At present, the case is under further investigation.



**May 11, 2022** // Bearing prices expected to increase by 20%. The ongoing Russian-Ukrainian war affects also the prices of bearings and related components. This is stated by analysts who assessed the current situation of the bearing industry worldwide. From March to April, some of the global bearing manufacturers, including the larger producers in China already increased the prices with an average of 8%. According to available statistics, prices for more than 60 different types of raw materials have increased during the last month. The prices risen between 1,480 USD per ton, to the largest reached increase up to 21,500 USD per ton. Due to the tense situation which is caused by the war situation, the prices of natural gas and electricity is also heated up, while the price of crude oil reached

a new eight-year record. The rise in oil prices continues to increase the transportation costs, resulting in Marine companies to follow the trend. The cost for transit through the Suez Canal has increased since May 1, which is the third increase for 2022. This includes a 20% surcharge for the passage fee for container ships in the northern direction (Red Sea → Mediterranean Sea). According to the sources from China, more and more medium and small size bearing production facilities in China choose to either actively or passively stop production, which may lead to a shortage of bearings in the market in the near future. At present, the cumulative increase in product prices in the Chinese bearing market (domestically) has exceeded 5%, and the largest price increase for many local bearing brands has reached 10%. According to the analysts, this is only the situation at the beginning of the second quarter. The increase in prices is likely to exceed 13% in the middle of the year, and may reach 20% during the year.

**May 15, 2022** // As half of bearings were imported, Russia and Belarus are currently facing a big challenge and shift of sources for the supply of bearings and related components. The sales and demand for bearings looks similar to 2021. Increase in prices and availability of stocks could cover and sustain the supply till now. But more problems are approaching, and complexities expected soon. Main problems are noted at bigger conveyor plants who need a large amount of bearings for daily operations and production. The most of Russian automotive manufacturers and some of their sub-companies were forced to stop their production lines. AVTOVAZ (Renault-Nissan-Mitsubishi alliance) couldn't restart the production since end of February 2022. According to the provided information the new management is planning and working to restart the production again in July. Russian truck manufacturers like GAZ group, KAMAZ and UAZ



— Photo: Minister of Industry and Trade of Russia, Denis Manturov at a meeting with representatives of the Russian bearing industry during a visit in April 2022. He stated that the government will support bearing plants and highlighted the strategic importance of the bearing industry.

had to stop their production earlier in May. The most of foreign assembly automotive manufacturers were forced to do the same. Manufacturers of auto components like KARDAN, TZA, SOATE, MZATE and BRT (Avtoform) suspended their activities, postponed official leaves to a later period or were forced to reduce their production because of the lack of components. Rail car plants in Nizhny Tagil, Tver and Altay have also experienced supply problems for TBU bearings. Main producers of TBU bearings (EPK-Brenco, SKF Tver, Timken) had stopped their production earlier this year because of the imposed sanctions. Majority of industrial consumers of bearings and related components still maintain their activities because of the available stocks in the country, which are traded at a higher cost price than before the sanctions. There is a search for alternatives for the premium brands such as SKF, Schaeffler, NSK, Timken etc, who stopped their activities and for which there was a huge demand within specific plants and industries. Main local bearing manufacturers in Russia and Belarus have currently an overload of orders, arranging additional product lines and prolong the working week planning. Trading companies are trying to solve the problems with containers which were blocked in European ports and Kazakhstan border and try to work on new schemes of imports. The most of traders doubled the prices for these



ANNUAL BUSINESS CONVENTION 28–30 SEPTEMBER 2022



# MORE NETWORKING OPPORTUNITIES THAN EVER



## EXECUTIVE NETWORKING

This edition brings more networking opportunities than ever.



## BUSINESS DEVELOPMENT

Over 80% of participants usually increase their businesses through our event.



## KNOWLEDGE & DATA

Discuss and learn more about the EPTDA Business Intelligence reports right from the source.




## A GLOBAL COMMUNITY


Meet business professionals from over 25 countries (and counting!).

Headline Partner



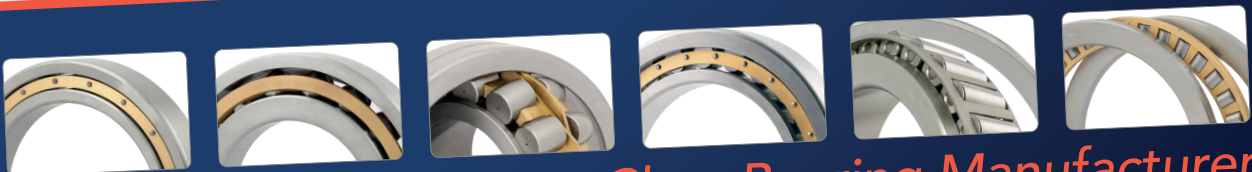
Connect with EPTDA

 /company/eptda

 /eptda



AND YOU?



**RKB: The Swiss Premium Class Bearing Manufacturer**

RKB Europe SA  
Executive Headquarters and Technological Center

Via Primo Agosto 1 · 6828 Balerna  
P.O. Box 16 · 6830 Chiasso 3  
Switzerland

Phone +41 91 260 09 30 · Fax +41 91 260 09 50  
info@rkbeurope.com · www.rkbbearings.com  
VAT No. CHE-113.327.770





company, with the new agreement, has been recognized for its distinguished track record in providing outstanding service and support for customers. Confirmation of the agreement comes following a difficult time in which parts of the market have struggled against the backdrop of the COVID-19 pandemic and now, facing new uncertainties surrounding the military conflict in Ukraine. The extension to the agreement reflects the strength of the partnership between the two companies, and their ongoing resilience in adapting and thriving within a challenging market. For customers, being an authorized Dodge distributor provides a guaranteed badge of quality and integrity. It offers peace of mind that accredited companies such as Race Transmissions can be trusted to deliver authentic.

reasons. Expectation is to stabilize the bearing and industrial components prices to the end of 2022, with the implementation of the new supply chain plans and the local currency that surprisingly gets stronger after the start of exporting Russian energy sources in local currency. Overall there is a great challenge for the bearing industry since Russia, Ukraine and Belarus were the main players for the consumption and production of bearings in the region. The lack of bearings will push Russian customers to search for new sources, suppliers and further develop local production. With more than 50% of bearings imported during the last decade, the main expectation is that the gap will be filled by Asian bearing manufacturers.

future collaboration before the end of 2022. The steering businesses of both companies are highly complementary and synergetic with regard to product competencies, geographic footprints and customer groups. NSK expects the combined capabilities will enable the joint venture to meet the broad and highly technological needs of global automotive customers. It will also allow the combined entity to compete more effectively in the global steering industry. Steering systems from NSK centre on innovative products such as lightweight and compact electric power steering (EPS), manual steering columns with adjustment capability and effective energy absorption features, and lightweight joints and shafts offering numerous integrated functions. With the signed MoU, both companies agree on a non-binding assessment phase of the relevant businesses without any preconceived outcomes. A decision on a possible cooperation model will be taken by the end of the year.



**May 24, 2022** // NSK Ltd and thyssenkrupp AG have signed a memorandum of understanding (MoU) to explore a potential joint venture between NSK Steering and thyssenkrupp Automotive. Both companies will now enter an assessment phase before taking a decision on any

**June 11, 2022** // Race Transmissions renews agreement to supply Dodge products. West Midlands-based Race Transmissions has extended its agreement with Dodge Industrial, Inc to remain as an Authorized Dodge Distributor for a further two years. Race Transmissions has renewed its contract to remain as a valued distributor partner in UK for Dodge mechanical power transmission products. The





**June 16, 2022** // New Strategic Partnership has been signed between Godiva Bearings and Carter Americas

**June 19, 2022** // SKF and ABB have entered into a Memorandum of Understanding (MoU) to explore the possibilities for a collaboration in the automation of manufacturing processes. The MoU was signed at ABB's Robotics Experience Center in Västerås, Sweden, by SKF CEO Rickard Gustafson and ABB CEO Björn Rosengren. Following the successful delivery of a number of projects in SKF's global manufacturing network, including in Gothenburg, where a fleet of industrial robots from ABB are installed in the bearing manufacturer's state-of-the-art factory, the two companies are now taking the next step in their collaboration. Through the partnership, SKF and ABB will identify and evaluate solutions to improve manufacturing capabilities and support clients' increased production efficiency. As a first step, SKF's investments in automation and



clean manufacturing processes will act as a testbed, focused on decreasing CO2 emissions from SKF's operations. Longer-term, the parties intend to explore new business opportunities in both traditional and new market segments, where both companies bring experiences within a wide range of industries.

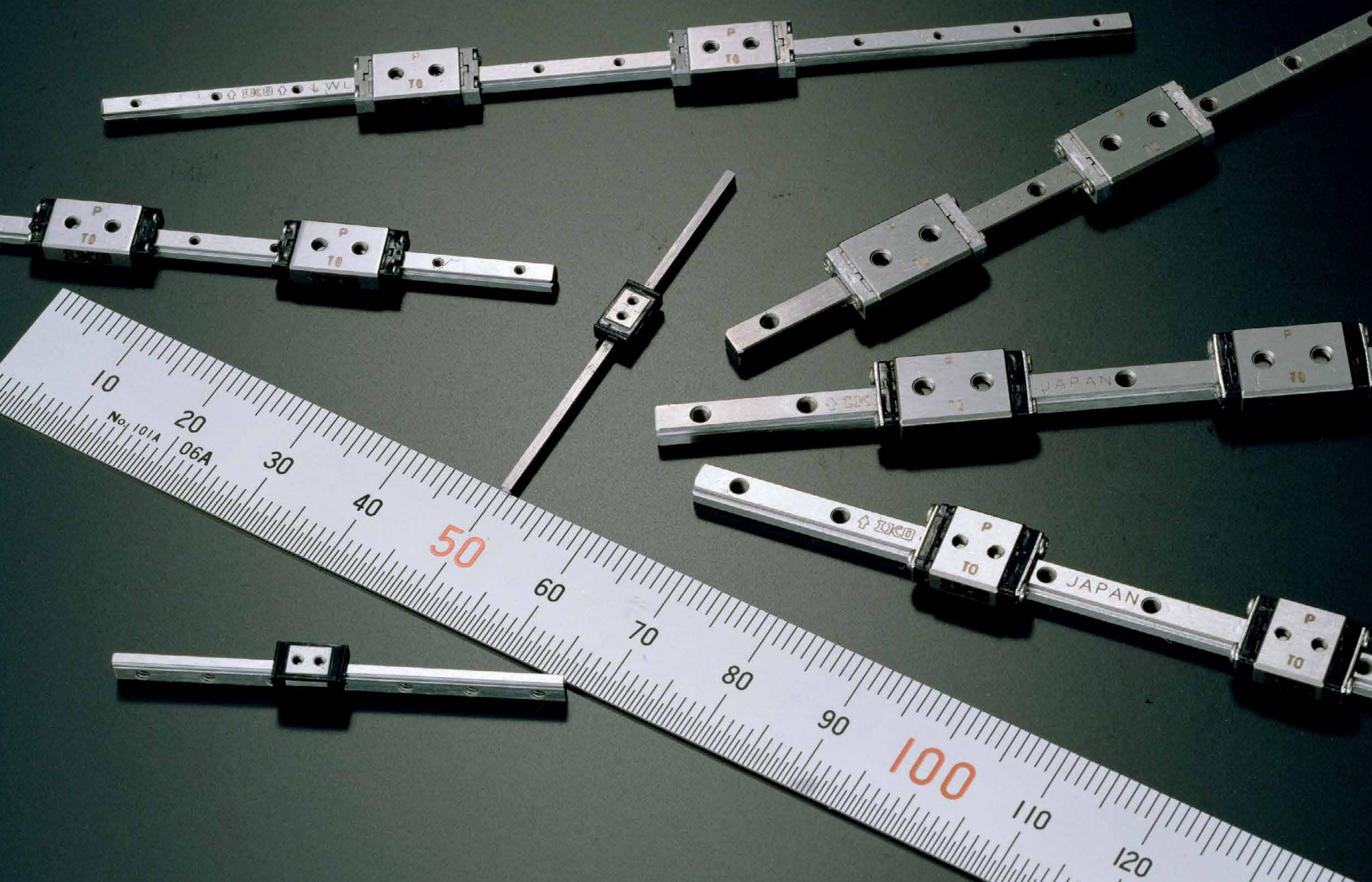
**June 24, 2022** // Authorities confiscate significant haul of counterfeit NSK bearings. The recent discovery of a large number of counterfeit NSK bearings in Johannesburg, South Africa, highlights the need to remain vigilant in the face of criminals who look to put the safety and integrity of industrial machinery and humans at risk. Towards the end of April 2022, a Police search and seizure operation (initiated by NSK) led to the confiscation of thousands of replica bearings (98% industrial types) worth an estimated R5 million. Criminal and civil proceedings are now underway against the perpetrators, who will shortly receive a court summons. Due to its market reputation for quality, founded on over a century of engineering excellence, NSK has become a target brand for counterfeiters. However, the company's Global Aftermarket department continues to protect the company's brand image, working closely with local authorities around the world. Fake bearings not only 'dupe' end users into thinking they are purchasing quality products at reduced prices, they carry the risk of premature

and potentially dangerous failure. In the current inflationary climate, budgetary pressures are driving many bearing users to shop around for irresistible bargains, but these often come at a far higher price. Low-quality counterfeit bearings will fail long before their expected service life, sometimes catastrophically, compromising the safety of expensive capital assets and humans. In almost all cases, using fake bearings leads to higher lifecycle costs, not to mention the costs associated with subsequent damage to company/brand reputation. Steel quality is often the differentiating factor, where a disparity in operating life of up to 20 times (between genuine and counterfeit) is not uncommon. Some bearing users also increase their vulnerability to counterfeits by employing subcontractors for equipment repairs on assets such as electric motors, pumps, gearboxes and fans. Unless subcontractors are vetted to check they understand the risks and have appropriate controls in place, they may inadvertently purchase and install counterfeit bearings during maintenance or refurbishment.



**July 5, 2022** // BEARING WORLD is back – live with valuable insights, exciting sessions and captivating speeches. On 05.07. and 06.07.2022 the international bearing forum BEARING WORLD took place in the idyllic and culturally rich Würzburg. Around 200 participants from Belgium, France, Germany, Great Britain, Italy, the Netherlands, Spain and Sweden entered into dialogue with 21 exhibitors on these two days – including the organizer FVA GmbH and the sponsors of the congress Schaeffler Technologies, SKF Group and FUCHS

# IKO



**NEW** to the **IKO** range is the LWLF2 with a track rail width of 2mm

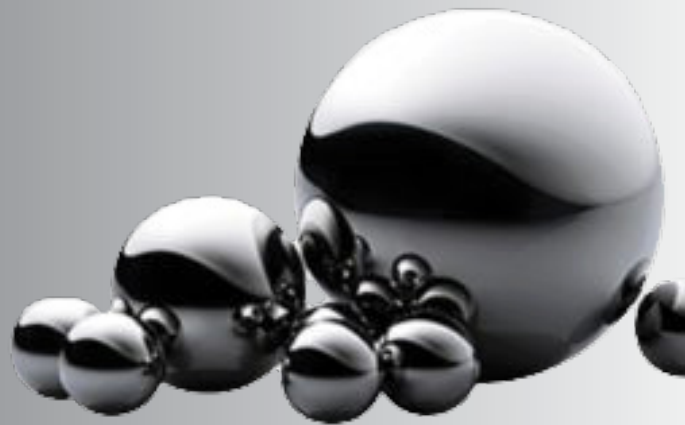
The ultra small size is available in the Linear Way L Series offering wider rails and slide units that will assist with high precision and rigidity thanks to the two rows of balls that make contact with the raceway at four points.

Features include effortless assembly due to the threaded mounting holes that make it possible to mount the rail with ease. Our technology delivers the lowest sectional height in the industry, coupled with stainless steel made material, makes this product suitable for many applications including cleanroom environments.

experts in  
**MOTION**



# COMPONENTS DESIGNED FOR AIRCRAFT BEARINGS



- High precision steel balls in 52100 AMS6444 and in AISI 440C AMS 5630 steel;
- High precision balls in M50 VIM VAR AMS6491 steel;
- Silicon Nitride balls in G3, G5 and G10 grades;
- Cylindrical and Taper rollers in Silicon Nitride (with customized profile)
- Rings & bushes in special steels



## Main advantages:

- Flexibility to offer small batches;
- Steel from qualified sources only;
- Class I and Class II Silicon Nitride as for ASTM F2094-06;
- Excellent quality/price ratio and short leadtimes.



*We help make our customers more successful!*

 via Martiri del XXI 110 bis 10064 Pinerolo (TO) - Italy

 +39 0121 376811

 [info@consulting-trading.com](mailto:info@consulting-trading.com)

 [www.consulting-trading.com](http://www.consulting-trading.com)



LUBRICANTS GERMANY. Prof. Gerhard Poll from Leibniz University Hannover and Christian Kunze from Research Association for Drive Technology opened BEARING WORLD. Dr. Michael Pausch from Schaeffler Technologies, Andrew Bell from SKF Group and Dr. Matthias Schweinsberg from FUCHS LUBRICANTS GERMANY kicked off the event with their keynotes, moderated by Prof. Bernd Sauer from the Technical University of Kaiserslautern.



**July 10, 2022** // OAV Air Bearings announce Motion Drives & Controls Ltd. as Distributor of the United Kingdom. OAV Air Bearings – the leading manufacturer of the recently advanced frictionless air bearing technology – is pleased to announce the addition of Motion Drives and Controls as Distributor of UK and Ireland.



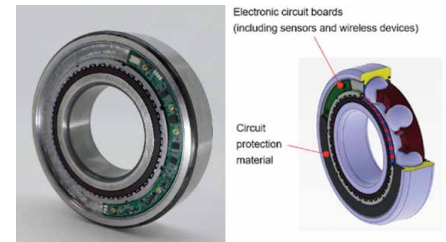
**July 21, 2022** // Rubix Acquires HEC to Expand Spanish Services Offer. As part of the Group's growth strategy, Rubix

has acquired compressed air specialist Holding Europeo de Compresores (HEC). The acquisition brings a new specialism to our customers in Spain while complementing our existing services offer in the flow category. HEC has a strong track record of reducing costs and carbon emissions for its customers, supporting them in addressing the energy price challenge and in meeting their environmental objectives. Specialising in the compressor end of the pneumatics value chain, the offer includes equipment sales as well as maintenance and repair, installation and compliance certification services. The business partners with its customers through long-term service and rental agreements. With 88 employees, HEC delivered almost €14m of sales in 2021. Over 50 per cent of employees are service-focused and 60% of sales are generated from services.



**July 25, 2022** // Bearings 2000 acquires MCL As a progressive business, at Bearings 2000 (B2K) are constantly evolving the methodologies and expanding footprint in South Africa's bearings landscape to provide customers with best-in-class products and service levels. The company announces the acquisition of MCL in Gqeberha (Port Elizabeth). This not only represents a significant milestone for B2K but for our existing and future customer base as the deal will provide superior value and fortify distribution across the Eastern Cape region.

**July 29, 2022** // NTN Develops Sensor Integrated Bearing "Talking Bearing™". The company has developed Sensor Integrated Bearing "Talking Bearing™" that incorporates sensors, power generation units, and wireless devices into bearing and wirelessly transmits

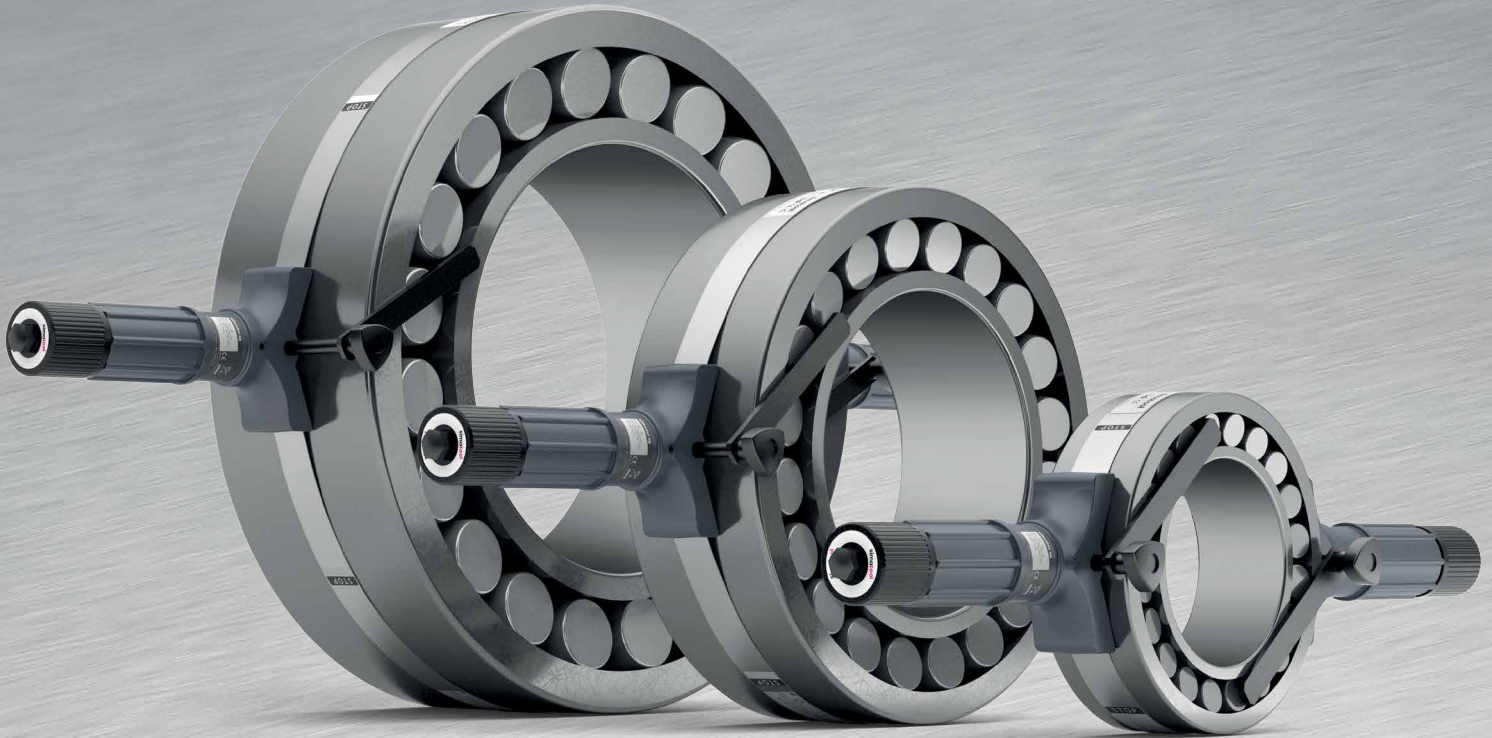


information on temperature, vibration, and rotational speed. As the sensors are built into the bearing, the newly developed product realizes more advanced condition monitoring and early abnormality detection than sensors attached to outside of equipment. At manufacturing sites, there is a strong demand to minimize downtime of facilities by monitoring operating status of equipment, and conducting appropriate and systematic maintenance and parts replacement based on data in order to improve production efficiency. In addition, with advancement of DX and IoT technologies in recent years, there has also been growing needs to stabilize and improve manufacturing quality through remote or automatic monitoring of equipment that is not subject to location or time constraints and use of obtained condition monitoring information.

**August 8, 2022** // Bowman International, a leading innovator of bearings and components, has announced a new associate for its Split Bearings Division, in South Africa. Bowman Split Bearings South Africa Pty Ltd, will work closely with Bowman's Split Bearing Division to deliver the manufacturer's high-load capacity split roller bearings to the South African and African markets. Managing Director, Paul Mitchell, comments on this latest addition to Bowman's network of distributors:



# The new Bearing Handling Tool 200-400 mm: The safe solution for handling large and heavy bearings



The Bearing Handling System is ideal for safely lifting cylindrical bearings with a maximum weight of 150 kg. The steel band can enclose bearings with outside diameters of 200-400 mm, leaving the bore free so that the bearing can be easily slid onto the shaft. The BHT 200-400 is TÜV SÜD certified and tested. The new Bearing Handling Tool completes the BHT family.

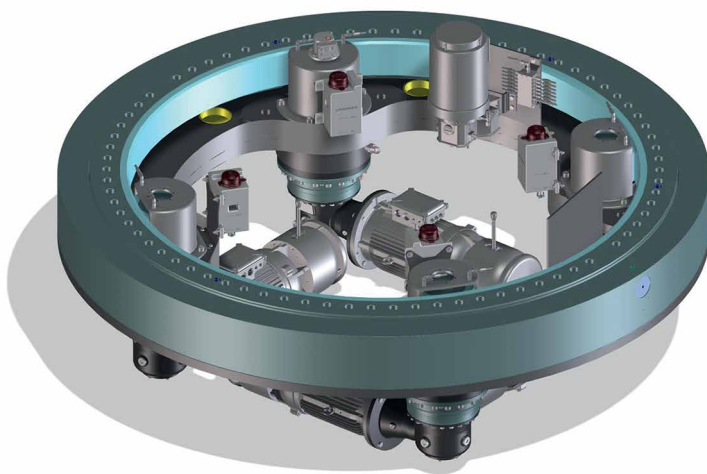
## Advantages

- Bearing bore remains free for mounting on shaft
- Avoidance of accident risk
- Mounting on shaft possible in horizontal and vertical position
- Anti-rotation devices prevent the inner ring of angular contact bearings (self-aligning ball bearings) prevent the inner ring from swinging out
- Safe lifting of bearings up to 150 kg
- Can be used in combination with simatherm induction heating device



# Revolutionary Slewing Bearing & Drive System for Wind-assisted propulsion:

## Harness the wind with Liebherr



*—The electric adjustment system by Liebherr: The module includes slewing bearings, slewing drives, electric motor and lubrication system, as well as position detection and monitoring.*

- Liebherr supplies components for wind-assisted propulsion as a solution for clean energy shipping
- Slewing bearings, drives and swivelling drives work in perfect harmony to turn sails in the wind
- The pre-mounted electric slewing module from Liebherr moves the sails into the correct position

Liebherr makes use of the wind as a resource for clean energy shipping, as well, and offers wind-assisted propulsion as an alternative solution. Slewing bearings and slewing drives excel at working together perfectly on high seas. The overall design of the wind-assisted propulsion consists of high, futuristic-looking sails that turn towards the wind and complement conventional ship propulsion still driven by diesel engines, for example. Hence, the technology harnesses the wind to propel a wide variety of vessels, such as bulk carriers, and thus ensures greater energy efficiency.



Nussbaumen (Switzerland), March 9, 2022 - Almost 90 per cent of global trade is handled via commercial shipping. As of today, most giants of the sea still rely on heavy oil as fuel. Burning heavy oil does not only produce carbon dioxide, but also emits sulphur dioxide, which is harmful to the environment. To reduce the impact on global ecosystems, ships in certain areas are only allowed to have 0.1 per cent sulphur in their fuel or have to retrofit gas scrubbers to minimise sulphur dioxide emissions. However, this means that fuel or equipment is of higher quality and, therefore, more expensive. Hence, shipping companies face a major economic challenge – the reduction of environmental pollution and fuel consumption. One possible solution would be to use the power of the wind.

The high seas offer plenty of wind. It is freely accessible and above all, it is environmentally friendly. Therefore, it

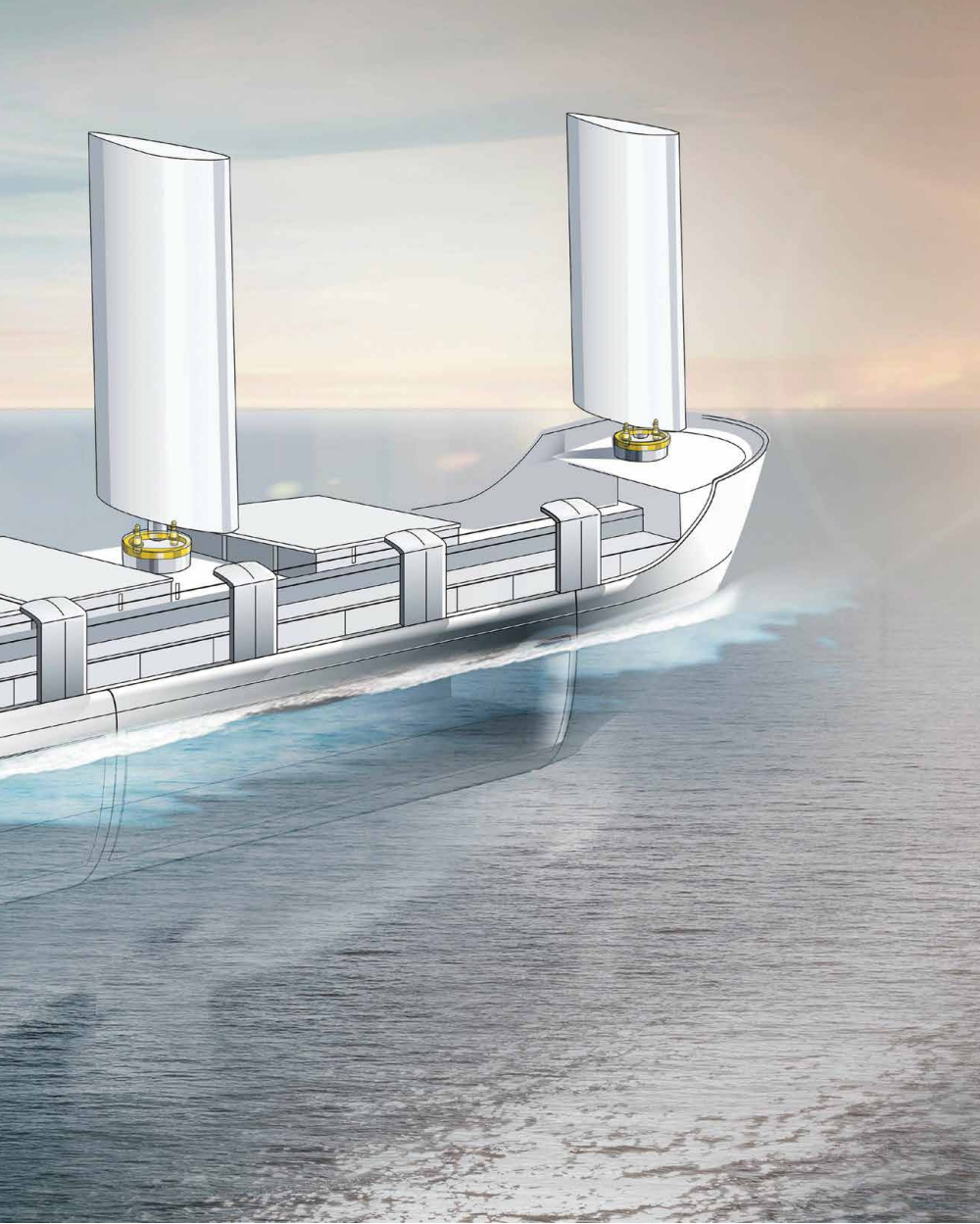
would make sense to harness it for clean energy shipping. “Wind-assisted propulsion is the key word here,” explains Benjamin Schmid, Key Account Manager Maritime at Liebherr-Components AG. Liebherr offers a solution that includes two essential components: a slewing bearing and a slewing drive. Together, they prove their worth on high seas. The overall design of the wind-assisted propulsion consists of high, futuristic-looking sails that turn towards the wind and complement conventional ship propulsion, which is still driven by diesel engines. Hence, the technology harnesses the wind to propel a wide variety of vessels, such as bulk carriers, and, thus, ensures greater energy efficiency. “The sails convert wind power into direct propulsion. In this way, they can support conventional propulsion on the ship and reduce fuel costs by up to 30 per cent without losing speed,” explains Benjamin Schmid.

### **Time to get things moving**

In the development of components, Liebherr draws on decades of experience in the production of offshore cranes, as well as on its expertise in the field of offshore wind turbines or blade bearings. The approach to the calculation of the forces on high seas can be derived from said technology. The size of the sail, the weight and the centre of gravity can all be used to make assumptions about the forces that occur. Thereon, Liebherr has created its own tool, in order to better grasp the green technology. It allows the ideal design of the slewing bearings, drives and swivel drives, which are responsible for the turning of the sails in the wind.

### **The power lies in the detail**

To prevent salt water from penetrating the bearing and grease from leaking out, Liebherr pays close attention to the seal. Special



sealing systems in the slewing bearings for offshore applications ensure safety during seawater operation. The double sealing system consists of two sealing lips: While the first protects against coarse dirt, the second prevents the intrusion of contaminants. The double seal, thus, prevents seawater from entering the raceway system to avoid major damage to the slewing bearing. In addition, the maritime CX coating according to DIN EN ISO 12944 ensures that the surface of the slewing bearing remains resistant to seawater. The slewing drive with lubrication pinion comes with an optional tooth safety geometry. This safety aspect ensures that the gear does not jam and protects the entire system – the slewing bearing and the slewing drive – from major damage.

#### **In perfect harmony: the electric adjustment system**

To make the most of wind, the sails must

be able to turn in the right direction. This is where the electric adjustment system from Liebherr provides an ideal solution. As a pre-assembled module, the components underneath the sail work together to align the sails. In the process, a higher-level control system gives the sails a specific value for rotation. The Liebherr electric adjustment system then implements this rotation, including a comparison of target/actual value comparison.

“The electric adjustment system for the wind-assisted propulsion is a completely pre-assembled module. It consists of a slewing bearing, a slewing drive and an electric motor. Together with control and power electronics built into a control cabinet, it makes the sail turn,” Benjamin Schmid continues. An integrated position detection and monitoring system takes care of the constant comparison of the target/actual rotation. In addition, a lubrication system is built into the module.

Controlled via the control cabinet, the system triggers appropriate lubrication intervals for the bearing raceway, the gearing and the pinions. The module comes as a plug-and-play solution. Since it is completely pre-assembled, the module allows an extremely quick deployment. The tedious assembly of the gearbox or the adjustment of the tooth-flank backlash, for example, is no longer the case.

With this innovative solution for wind-assisted propulsion, Liebherr is also contributing to a more sustainable shipping and a lower-emission world.

#### **About Liebherr-Components AG**

*In this segment, the Liebherr Group specialises in the development, design, manufacturing of high-performance components in the field of mechanical, hydraulic and electric drive and control technology. Liebherr-Component Technologies AG, based in Bulle (Switzerland), coordinates all activities in the Components product segment. The extensive product range includes diesel and gas engines, injection systems, engine control units, axial piston pumps and motors, hydraulic cylinders, slewing bearings, gearboxes and winches, switchgear, electronic and power electronics components, and software. The high-quality components are used in cranes and earthmoving machinery, in the mining industry, maritime applications, wind turbines, automotive engineering or in aviation and transport technology. Synergy effects in s other product segments of the Liebherr Group are used to drive continuous technological development.*

#### **About the Liebherr Group**

*The Liebherr Group is a family-run technology company with a highly diversified product portfolio. The company is one of the largest construction equipment manufacturers in the world. It also provides high quality and user-oriented products and services in a wide range of other areas. The Liebherr Group includes over 140 companies across all continents. In 2020, it employed around 48,000 staff and achieved combined revenues of over 10.3 billion euros. Liebherr was founded in Kirchdorf an der Iller in Southern Germany in 1949. Since then, the employees have been pursuing the goal of achieving continuous technological innovation, and bringing industry-leading solutions to its customers.*



# Ultrasound... A Jack of All Trades

## *The Swiss Army Knife of Condition Monitoring*

“Versatile” is an attribute often used to describe ultrasound technology. Some have even coined it the “Swiss Army Knife” of condition monitoring. Depending on your perception of Swiss army knives, that could be both flattering and condemning at the same time. The knife itself is iconic with Swiss-made quality, while the phrase “Swiss Army Knife”, over time, morphed into an adjective to describe craftspeople with diverse skills, capable of practically any task. The Jack of All Trades evolved from a simpler time. Before technology spawned the need for “specialists”, handymen were called upon to fix practically anything. They remain a holdover from our rural roots, when it was good economy to just fix it yourself. My father is a JAT personified.

For some ultrasound brands, the swiss army knife analogy to durability and quality are appropriate. Yet there is a tendency to be wary of things — and people — who claim they can fix everything and anything. A “Jack of all Trades” may seem handy at times, but he also comes with the stigma of being good at many things, but master of nothing.

Is it dangerous in today’s high-tech world to call upon unskilled tradespeople who consistently demonstrate their willingness to help? A skilled carpenter has more than likely dabbled with electrical wiring, but unless he is trained and certified to a national electrical code, it’s probably not a great idea to ask him to wire your home. Similarly, a licensed plumber is always a better choice over a DIY handyman for your bathroom renovation.

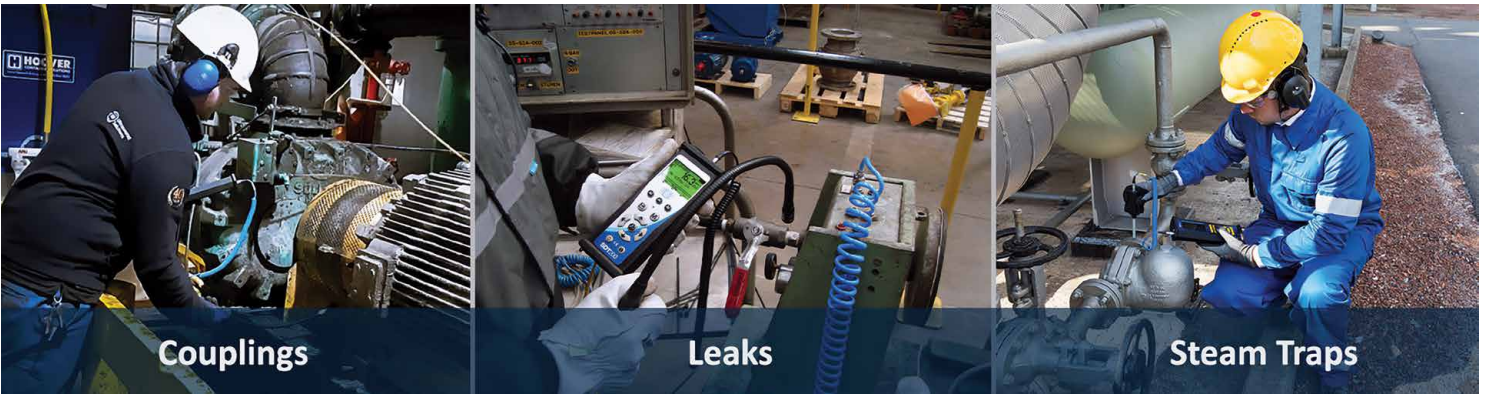
This is not the case for ultrasound testing where there are so many applications. More hidden defects are found with this technology than any other condition

monitoring technique. What’s more, these issues are often discovered by inspectors with little or no experience. And that may be ultrasound’s most significant appeal. It is a technology for the people.

### **Operator Driven Reliability**

Many of the tasks possible with ultrasound are easy to execute. Some require less than an hour of instruction in the hands of a conscientious inspector. Scanning for leaks, inspecting shaft couplings, and testing steam traps are just three examples of simple checks an operator might perform





on her work area at the beginning or end of a shift to ensure assets were found and left in good working order. And there are many more tasks that should be considered the primary responsibility of asset operators; not the Condition Monitoring team.

This strategy leverages the familiarity operators have acquired from working with the same assets, day in and day out. Operator inspections can reduce energy waste and even lead to fewer unplanned emergency maintenance interventions. They help take a load off the condition monitoring and maintenance teams who now have more time to focus on assets with higher criticality ratings.

Ultrasound also has its limits. Conducting a plant-wide leak survey on your compressed air network? Ultrasound is the tool of choice. On the other hand, searching for a minuscule Freon leak in an air conditioning system might be asking too much. There are better technologies for finding Freon leaks. The risk of deploying this trusted technology for tasks where it is not well-suited is very real. Consequently, understanding when and where ultrasound gets utilized, is as important to your success as are the skills and techniques of the inspector.

### The Eight Pillars of Ultrasound

In all, SDT identifies eight domains for applying ultrasound to asset reliability. These eight are famously known as “The Eight Pillars of Ultrasound” and address these elements:

### Stay FIT

The eight pillars support reliability in a world of unreliable assets. But it is easy to understand how the technology could be prone to misuse. To guide novice inspectors SDT devised a simple, three-letter acronym. All assets will produce ultrasound in the presence of three phenomena: Friction, Impacting and Turbulence. Together they spell FIT. If you believe the failure mode you are searching for produces one, two, or all three of these conditions, then Ultrasound is a FIT for your FMEA (Failure Mode and Effects Analysis).



Reliability leaders who laud ultrasound’s versatility are cautioned not to over-extend its capabilities. A proven defender against so many potential failure modes, resist the temptation to push ultrasound to perform unsuitable tasks. The expression, “you’re only as good as your last win” cuts with a double-edged blade. The exuberance from finding one game-changing production-halting defect can quickly be replaced with the depressing apathy of one failed diagnosis. The foundation of trust built by ten wins can crumble

under the weight of one missed call.

In our family, receiving a Swiss Army Knife on your birthday was a rite of passage into manhood. The tradition served as a reminder of our heritage and a simpler, do-it-yourself era. Whether the gadget was used to cut a length of string, remove a screw, whittle a piece of wood, or trim a stubborn fingernail, the multi-faceted tool gifted the user with convenience and self-sufficiency.

The parallel to ultrasound instruments emphasizes that every condition monitoring inspection need not be carried out by specialists. While the importance of good training is still important, simple techniques with easy-to-use technologies can net significant rewards for reliability.

More details about this article can be read on the following link <https://sdt.training/ultrasound-a-jack-of-all-trades>

### About The Author

#### Allan Rienstra

*Some say I'm passionate about ultrasound. They are not wrong, but not right either. I am passionate about helping people get the most from their investment in technologies that create safe workplaces, reduce unplanned downtime, and eliminate waste. Ultrasound just so happens to be THAT technology. There is so much we can do to create accident free, proactive, environmentally sustainable conditions in manufacturing. All we need to do is CARE and HEAR MORE. If you care like I do, join me and together let's make Earth Great Again.*

## APPLICATIONS



**MECHANICAL**  
Detect defects in any mechanical system.



**LEAKS**  
Find pressure and vacuum leaks in noisy conditions.



**LUBRICATION**  
Avoid over/under lubrication. Grease bearings right.



**ELECTRICAL**  
Inspect medium and high voltage systems for arcing, tracking and corona.



**VALVES**  
Assess valve tightness and function



**STEAM**  
Find faulty steam traps and leaking components.



**HYDRAULICS**  
Troubleshoot any hydraulic system for passing and blockages.



**TIGHTNESS**  
Determine the tightness of any enclosed volume.

# RKB

## Pin-Type Cages for Large-Sized Bearings

Q&A session with Dr. Eng. Alberto Barili

Bearing manufacturing is a highly competitive industry, one direct consequence being its high rate of research and development. The extent to which innovation is built into the production flow represents a key differentiation factor among the companies acting in this market. If effectively achieved, it is also a resource for organic growth and, on this basis, for ongoing design and performance improvements of various types of bearings.



Dr. Eng. Alberto Barili,  
Part of the RKB Technical Team Unit.

*To get the detailed information regarding the RKB strategy and actions in this crucial field, we discussed with Dr. Eng. Alberto Barili, part of the RKB Technical Team Unit.*

**Q: Good afternoon, Alberto! Thank you for your readiness to answer a couple of questions on the RKB approach regarding the prompt and effective introduction of technological progress in bearings manufacturing. Out of this extensive topic, let us focus on the pin-type cage for large-size bearings. Let's start with where RKB bearings with pin-type cages are used the most and which are the criteria that are guiding the RKB application engineers toward this solution.**

**A:** Typically, the bearings with a pin-type cage are used when a significant increase in bearing load capacity is required compared to the traditional window-type cage design. Pin-type cages feature a greater load carrying capacity mainly due to the increased number of rollers. This is the optimal solution for the heavy industry where the RKB bearings are exposed to high working loads. To withstand these harsh working conditions, it's required to maximize the basic load ratings without sacrificing the reliability of the bearing. A typical

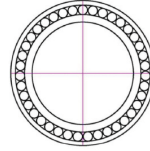



application is a backup roll of a 4-high cold rolling mill stand in the steel industry.

**Q: Please present an already concluded RKB case study on the pin-type cage's effective performance.**

**A:** Sure. The below picture shows the same bearing but, on the left, the version with a pressed steel cage and solid rollers and, on the right, the one with a pin-type cage and pierced rollers. As you can see, the number of rollers increases from 38 to 39.

## PIERCED ROLLER BENEFITS – REAL CASE STUDY 1 OF 2

Pierced roller bearings with pin-type cage assemblies are generally used due to the increased number of rollers compared to standard window-type cage (RKB EVO) or pressed steel cage, especially for heavy load conditions and low operating speeds.

			
Bearing PN	RKB Set 2xTDI 243309 SPAVL	Bearing PN	RKB Set 2xTDI 243309 SPAVL
 Design	Pressed steel cage	 Design	Pin-type cage
 Rollers	Solid rollers	 Rollers	Pierced rollers
 N° of rollers	Z = 38	 N° of rollers	Z = 39

**Pin-type cage design with pierced rollers has more rollers than window-type cage!!!**

This small change, with other internal dimensional improvements, leads to an L10 value higher by nearly 37%!

**Q: Let's continue with the example of the RKB 4-row tapered roller bearings with pierced rollers and a pin-type cage. Which are their main features?**

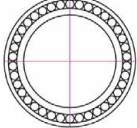
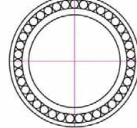
A: Even if not typical when answering questions, I would start with a conclusion I believe is relevant from our customers' perspective. All features, such as the preset or custom BEP, allow making assembly, disassembly and maintenance operations easier and to maximize the bearing life. Coming back to your question, the picture below presents the main features of the bearing we chose for exemplification purposes.

**Q: As an engineer, how would you scale the manufacturing of bearings with pierced rollers and pin-type cages? Do we speak or not about a routine process? In other words, is it or is it not something accessible to many, if not all producers in the bearings market?**

A: First, I believe it is needed to focus on the premium bearings. By definition, their production is not reachable, not manageable by many.

To better present the difficulties which occur, it is useful to have a brief overview of the most common failures in low-quality bearings of this type.

## PIERCED ROLLER BENEFITS – REAL CASE STUDY 2 OF 2

			
Parameter	RKB set 2xTDI 243309 SPAVL (Pressed steel cage - solid rollers)	RKB set 2xTDI 243309 SPCVL (Pin-type cage - pierced rollers)	Pin-type cage benefits
$D_{we}$	100%	101,9%	+ 1,9%
$D_{pw}$	100%	99,8%	- 0,2%
$L_{we}$	100%	105,3%	+ 5,3%
Z	100%	102,6%	+ 2,6%
$C_r$	100%	109,8%	+ 9,8%
$L_{10}$	100%	136,5%	+ 36,5%

## 4-ROW TRB – PIERCED ROLLER DESIGN

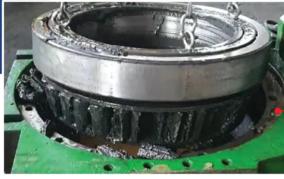


### Bearing Design:

- One double cup, two single cups, plus two cup spacers (plain or with lubrication grooves and holes)
- Two double cones, plus one cone spacer (plain or with lubrication holes)
- Four two-piece steel pin-type cages
- Pierced roller execution to increase load rating capacities
- Preset or adjusted BEP on customer's request
- Available with helical groove in the bore (G)
- Marked zones on cups side face to easy mounting and maintenance operations

For further information on all RKB pierced roller designs and much more, please consult our [online catalogue](#).

## LOW QUALITY NO-BRAND PIERCED ROLLER BEARINGS



**Catastrophic failure of low quality no-brand pierced roller bearing M 2741 49 DW/110!!!**



**Premature failure of low quality no-brand cage-roller assembly F-802030.TR4/LM274449DW.410.410D**



Typically, the most critical areas are:

- the welding of the cage rings
- the pin/ cage threaded coupling
- the entire roller/ pin/ cage assembly.

To continue with our practical approach, above there is an example of failure related to the roller/ pin/ cage assembly.

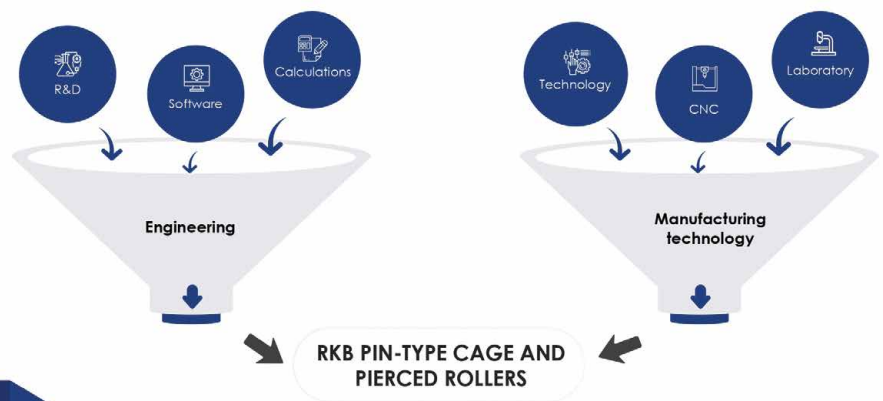
As it can be seen, the fracture of some rollers and the fracture and deformation of some pins during bearing rotation caused the immediate bearing seizure with an unplanned production stop.

To conclude my answer, I believe it is clear that the choice of the actual bearing acquired is not a neutral, consequences-free decision. Even if a low-quality generic bearing seems like a good initial investment, its major comparative disadvantages frequently appear even in the short-term, not to mention the mid and long-term ones. Losses generated by production equipment downtimes and repairs result in a sharp increase in the customers' Total Cost of Ownership.

**Q: Maintaining and consolidating the RKB competitiveness requires, among other important aspects, keeping up with the technological advancements in the bearings industry. Which is the RKB strategy in this regard? Which are the R&D guidelines followed?**

A: It is not an overclaim but a realistic evaluation that RKB is permanently

## RKB LATEST TECHNOLOGY



committing relevant resources in order to implement technological progress in our production and, thus, to manufacture up-to-date, high-quality bearings.

I believe it is appropriate to continue with the example detailed during our discussion.

The pin-type cage bearing is one of the most complex designs and, given this, its proper production requires the manufacturer have high know-how standards. RKB R&D activity is advancing in various directions to develop products which meet the continuously more demanding needs of our customers.

In the case of the pin-type cage design, RKB R&D is focused mainly on manufacturing technology and engineering. The pin-type

cage design has some critical areas that should always be effectively managed, operated and supervised to offer premium products in our competitive market. Some of these criticalities are, for example, the location tolerances of the cage ring holes, the clearance between each roller hole and the related pin, the clearance between the cage rings and the afferent roller face and the sorting tolerances of the rollers.

**Q: Many thanks, Alberto, for the information provided. I wish you and the RKB team the best of luck!**

A: Thank you!

You can learn more about RKB bearings at [www.rkbbearings.com](http://www.rkbbearings.com)



#### MODULAR SYSTEM

Each OnTrak is capable of 16 sensors. Easily scale OnTrak systems to thousands of sensors to one central dashboard

#### COMMUNICATION

(Ethernet, wifi or cellular)



#### SINGLE POINT LUBRICATOR

Dispense lubricant with precision only when needed from up to 16 single point lubrication devices



#### MOBILE VIEW

Viewable on any network connected device; pc, laptop, tablet, phone using a standard browser

#### ALARM NOTIFICATION

Built-in events system, which is configurable, and has the ability to display, email and text any alerts the system has

# BEARING LUBRICATION REIMAGINED

## Remote and Real Time Bearing Monitoring and Lubrication



The OnTrak SmartLube is a unique remote bearing monitoring and lubrication system. Designed to **monitor and lubricate bearings remotely**. With remote condition-based lubrication you can greatly reduce bearing failures.

System uses ultrasonic sensors: identify bearing issues beyond lubrication at the earliest possible point

Lubricate bearings remotely with a push of a button, using always the right grease and the right amount

All data accessible anytime, anywhere, via user-friendly dashboards

System includes single point lubricators: no more lubrication issues!

Easy to install, affordable and scalable

Integrates with existing databases and CMMS

**CONTACT US FOR A DEMONSTRATION WITH REAL LIFE DATA!**

**UE SYSTEMS UK & IRELAND - CHRIS HALLUM**  
+44 (0) 7930 352 188 | chrish@uesystems.com

**ue**  
**SYSTEMS INC**  
The *ultrasound* approach



Remanufactured by SKF 100473

**A smarter  
second life for  
industrial bearings**





### SKF is finding ways to make remanufacturing even more cost effective and environmentally sustainable.

Remanufacturing is a fundamental pillar of the circular economy and it has since long been part of SKF's offering to its industrial customers. When industrial bearings are removed from a machine during repairs or routine overhauls, they can be sent to a specialist SKF Services Centre to be disassembled, inspected, and restored to operational condition.

Compared with the production of a new bearing, remanufacturing uses less material, consumes less energy, and generates less carbon emissions. A remanufactured bearing reduces the carbon footprint compared to a new one by up to 90%.

### Transforming remanufacturing

Like any other industrial process, remanufacturing has its own costs and environmental impact. Bearings must be shipped from the end user to a dedicated facility, and the operations used to restore the bearing require energy and materials. The choices about when, where, and how to remanufacture a bearing can have a significant effect on the economic and environmental benefits of the process.

Such choices can be tricky to get right. For example, waiting too long before sending a bearing for remanufacturing means excessive wear or damage, which might make the remanufacturing impractical. Acting too early generates unnecessary costs and emissions. Once a bearing reaches the SKF facility, the company's remanufacturing engineers must choose the most cost-effective and energy-efficient remanufacturing steps to restore the performance of the bearing. Those critical decisions are usually made relying on the skill and judgement of end-user maintenance specialists, SKF's application engineers and remanufacturing experts. A major R&D program currently running at SKF aims to transform remanufacturing planning and execution bringing new

insights into bearing performance, improved analytical rigour, and incorporating the power of artificial intelligence (AI) to the process.

### Choosing efficiency

SKF REPaIR (Rotating Equipment Performance aided by Innovative Remanufacturing) is a multi-pronged R&D effort that looks at the complete remanufacturing value chain. Innovation begins at the customer plant, with an automated machine vision system that can evaluate bearing damage using digital photographs. The system uses AI, in the form of a deep neural network image recognition algorithm, which has been trained to detect and classify specific damages in bearings.

### AiVision-FM Model alpha-1





Unlike older machine vision approaches, SKF's AI vision system has been designed to operate in real-world conditions, where images may be obtained on the factory floor or in the field and tight control over lighting and composition are impossible. The system can identify the bearing surface even if the image is captured in suboptimal conditions.

SKF's system is in the future expected to provide an initial "go/no-go" evaluation of a bearing which would indicate to the customer whether the component is suitable for remanufacturing or not. In the latter case, it is probably more cost-efficient to responsibly recycle the bearing locally. This new AI vision system is explained in detail in a recent EVOLUTION article "The future of bearing failure analysis is here" (<https://evolution.skf.com/the-future-of-bearing-failure-analysis-is-here/>).

Once a bearing is selected for remanufacturing and transported to the nearest SKF Services Centre, it is disassembled and cleaned ready for detailed inspection. Here, the REPAIR

team is developing a new opto-mechanical inspection device based on machine learning technology. The images generated by this device will be processed by an AI system, which has been trained to identify and classify common bearing defects. Ultimately, the highly consistent images generated by the device will allow the AI tool to generate a comprehensive report on the condition of the bearing, including recommendations on the most appropriate sequence of remanufacturing steps. Remanufacturing inspection could offer

the opportunity to assess the health of the bearing material. But historically, the main way to confirm that the material is in good condition has been to look at the sub-surface structure through a microscope, a process that requires cutting the bearing.

The team is also exploring the use of novel non-destructive techniques to analyse the state of the material below the surface of the bearing. "The ultimate life of a bearing is determined by the fatigue life of the sub-surface material, but most bearings





fail much earlier due to surface damage”, says Hannes Leopoldseder, Business Unit Manager Industrial Services Centre at SKF. “Remanufacturing restores that surface, so the user can benefit from the full potential life of the bearing.” Non-destructive methods could allow the true remaining useful life of a bearing to be quantified for the first time.

#### **“Light-touch” remanufacturing**

SKF strive to find the most efficient processes for their remanufacturing, the ones that favour a lean and light touch approach over multi-step routes that characterise ‘heavy’ remanufacturing. To this end, the REPaIR team is running an extensive test program to compare the operating life of damaged bearings at different reprocessing levels.

By testing dozens of bearings to failure on accelerated life-testing rigs, the team aims to unlock opportunities for new “light-touch” remanufacturing strategies. For example, one common form of damage is the result of hard contaminant particles entering a bearing during use. As these particles are trapped between the rolling elements and the raceway, they can be pushed into the surface, causing damage. This type of damage usually appears as a

pit or dent in the surface of the material, creating material displacement. “These situations are of particular interest to us because the traditional remanufacturing approach in this situation would focus on removing the entire pit in the bearing surface. Eliminating that may require the removal of a lot of material,” says Sebastien Blachere, R&D scientist at SKF. “Removing only the main stress raisers is much easier, and our early tests have shown that doing this could be all you need to do to restore the full bearing life in some situations.”

#### **The life after remanufacturing**

The test program will give the REPaIR team a much clearer picture on the effectiveness of the different remanufacturing strategies. Data generated by the program will also be used as input for new calculation models for bearings that have been remanufactured. “All the elements of the analysis program will help end-users, says Hannes Leopoldseder. “The first question many customers ask is ‘how long will a remanufactured bearing last in my application?’ With this programme, we want to give them a quantitative comparison between a new bearing and a remanufactured bearing, in order for them to make remanufacturing decisions with confidence.”

This new ability to provide to the customer a life estimation after remanufacturing comes from two sources. The first one is a better understanding of the actual operating conditions in the application, for instance offering a more accurate estimation of the level of contamination. The second one is the precise knowledge of the actual conditions (surface and sub-surface) of the bearing parts after remanufacturing. These two sources are then the input of a predictive model based on current SKF high expertise in bearing performance modelling (GBLM Generalized Bearing Life Model).

#### **A bridge between R&D and business**

The REPaIR program is then paving the way towards new remanufacturing offers fulfilling high-end customer expectation on planning and performance, together with environmental sustainability. Its ambitious objectives and its promising intermediate findings are the results of a close collaboration between SKF researchers and direct actors of the SKF remanufacturing business. This efficient way to anchor R&D programs into direct business targets is showing excellent results towards SKF costumers and high motivation within the various project teams.

MOTION & CONTROL™

**NSK**



## PRECISELY FORWARD NSK MOTION SOLUTIONS

From Machine Tool, Injection Molding, Medical & Measuring to General Machinery applications, NSK offers the best technical solutions and a full range of engineering services. Every NSK Linear Guide, Ball Screw, Support Bearing and Super Precision Bearing is tailored to your specific needs. NSK, the only comprehensive engineering service supplier on the market, will take your business a step ahead. Find out more at [www.nskeurope-motionsolutions.com](http://www.nskeurope-motionsolutions.com).

**LINEAR GUIDES | BALL SCREWS | SUPPORT BEARINGS  
SUPER PRECISION BEARINGS | ENGINEERING | SERVICES**

# From **NBI** to grupo | **NBI**® ..

*This is the story of the NBI bearing brand*

NBI is a premium brand of bearings created in 2002. After two decades of continuous growth and driven by innovation, it has become what it is today, an industrial group, Grupo NBI.



## Grupo NBI

Initially, NBI originally focused on multi-product, multi-brand distributors, centered around the distribution sector in Spain. After a radical strategic change in 2005, it refocused its activity on manufacturing and marketing bearings under the NBI Bearings Europe brand to original equipment manufacturers in Europe, setting up its first factory in China in 2006.

The flotation on the alternative stock market in 2015 opened the doors to further development and expansion and has allowed NBI to come to be the solid industrial group which it is today.

NBI has strategically acquired seven companies which today provide the technologies and knowledge required to

manufacture each component of a bearing thus attaining vertical integration.

*The group consists of two divisions, the bearing division and the industrial division, with four well-differentiated business units, bearings, precision machining, metal transformation and aluminum injection.*



— NBI Bearings Europe manufacturing plant (Spain)

### The bearing division

Created 20 years ago and formed by a team of more than eighty people with extensive experience in the sector. It is focused on supplying bearings to OEM customers for applications with high technical requirements and approved by global benchmark customers in their sector.

NBI is well-equipped with a highly active and dedicated commercial team distributed between Spain, India, Romania, China and Brazil and an individualized both pre-sales and post-sales technical service. This being a differentiating element provided by NBI's highly experienced staff coupled with its exceptional application engineering.

With distribution centers in Spain, China, and India. This enables NBI to streamline and guarantee deliveries to all its customers.

A continuous investment in R&D and its own internally - developed design software are the strong points that make NBI stand out in design and manufacturing. NBI Bearings launched a new line of Enhanced+ bearings four years ago, with a higher load capacity and

consequently an increase in their useful life, with the constant additions of new references being included in the said line.

Metallography, metrology, and other testing laboratories equipped with the most advanced technology available. With production plants in Spain and India and a strategic agreement in China with a current manufacturing range: CRB, SRB, TRB, CRTB, SPB and CF. These strengths are what make NBI a premium brand competing with the leading brands in the market.

### The industrial division

NBI founded this division with the purpose of achieving vertical integration of the technologies and processes necessary for the manufacture of the different components of a bearing. Focused on the design, manufacture and supply of components and assemblies for the industry and aeronautical sector, selecting and investing in the optimal technology for the manufacture of each component. Formed by a highly experienced team of more than 240 people.

Divided into **three business units:**

#### Precision machining unit

Acquired in 2016, NBI benefits from its own stamping plant and a bar turning plant that provide the group with the knowledge, experience and capacity to design and manufacture cages as well as turned roller processes. Both are located in Spain.

#### Metal transformation unit

With a plant specialized in the design and production of fine boiler components and subassemblies for a wide range of industries (Spain 2018). Together with a plant for the design and manufacture of tools and serial parts for the aeronautical sector (Spain 2020).

#### Aluminium injection unit

(Created at the end of 2020). A plant in Romania focused on the supply of aluminium components mainly for the automotive sector. It incorporates into the group the processes and know-how of aluminium casting, injection, and machining.

For more information, visit  
<https://grouponbi.com>



Fenlon Asta™, The Revolutionary Technology for:

# Higher Bearing Performance



*Greater Load-*  
**Bearing  
Capacity**



**Extreme  
Temperatures**

Through the combined efforts of Fenner chemists and engineers, customers, third-party researchers, and the expertise of the Michelin Group, Fenner Precision Polymers unveils the revolutionary new bearing liner; Fenlon Asta™. In this BearingNEWS exclusive, Mr. Michael J. Knight, Senior Product Manager, Technical Textiles, discusses the significance of this new development, the remarkable effort undertaken to achieve it, and its impact on the bearing industry.

**Q: Can you tell us about your background and current role at Fenner Precision Polymers?**

Education wise, I have a B.S. in Textile/ Polymer Chemistry from NC State University. Multiple years of experience in Fibers/ Polymers, Additives, Thermoset & Thermoplastic Resins, and the processes that go along with each of these to include extensive Composite material knowledge. As Product Manager at Fenner, I am responsible for the P&L and New Product Development for the Technical Textiles business at Fenner Precision Polymers.

**Q: Which industries and applications are you mainly serving with Fenner Precision Polymers solutions?**

The Technical Textile business at Fenner includes Fabri Cote™ elastomeric coatings business in Los Angeles, CA and the Fenlon™ Self-Lubricating Fabrics business in Manheim, PA. Focusing on the Fenlon™ business, these applications frequently include metal on metal contact, high vibrations, or extended stationary periods. Our fabrics are used in a wide variety of applications such as plain spherical, thrust, rod end, journal, and pendulum bushings & bearings, meeting the needs of the most demanding, critical applications from airplane landing gear to earthquake protection systems. With this, we are excited to introduce the new Fenlon Asta material for AS81820 Type A (100k+ cycles) certifications for Fixed Wing aircraft as well as AS81819 certs for Rotor Craft applications.

“Fenner is the most vertical producer of Low Friction Solid Lubricating fabrics, controlling the production inputs to deliver the highest quality products and solutions”

**Q: Fenner Precision Polymers mentions three main advantages: Advanced Manufacturing, Customized Solutions and Materials Engineering. Can you provide more detail on this?**

It takes, in short, a Technical Textiles expert with the most advanced manufacturing, production and testing capabilities and a history in the most demanding applications. A company with world-class materials engineering capabilities. We are the most vertical producer of these type of Low Friction Solid Lubricating fabrics and control the production inputs to deliver the highest quality products and solutions. We offer individual solutions designed specifically to meet the technical requirements of the application. We pride ourselves on having clear technology leadership in materials engineering and manufacturing.

**Q: You mentioned that you have been working on the new self-lubricating bearing liner project for 3 years. Can you share more about the project?**

Realizing there was a specific market requirement for the Type A (100k+ cycles)

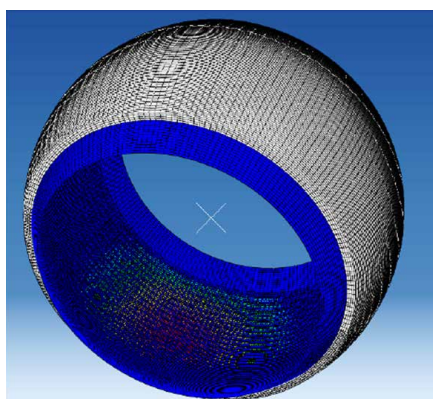
qualification under AS81820, we set forth a challenge to develop the Fenlon™ Asta to meet and surpass this challenge. As a Michelin Group Company, we were able to assemble a team of experienced and educated experts in the fields of Tribology, Finite Element Analysis and Material classifications to enhance our project success. Fenner was committed to finding a better way to meet this customer need. That meant the company not only had to develop and introduce a new high-performance liner that would meet the standard, but it also needed to create a laboratory test method that would replicate real performance for Fenlon customers. This method had to accurately predict wear profiles, coefficient of friction, and load capacity for each unique application. Fenlon Asta was three years well spent!

“Fenlon Asta is the answer for 250,000+ cycles, with the tightest tolerances possible...”

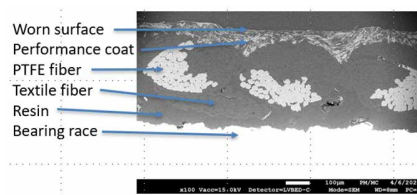


**Q: What are Fenlon Asta Liners exactly? And how are they used in bearing applications?**

Bearings are critical components in many aeronautics' applications, from landing gear and wheels to wings and other structural elements. One of the most vulnerable points in a bearing's structure is the location where the bearing's ball and race (or outer ring) come in contact. In the past, these surfaces, generally steel, were lubricated with greases and oils, which require frequent change-outs and replacement. Bearing manufacturers have now turned to low-friction, solid-lubricant fabric liners made of polytetrafluoroethylene (PTFE) that meet or surpass the performance of their liquid predecessors, without the constant maintenance and environmental impact of oils and greases.



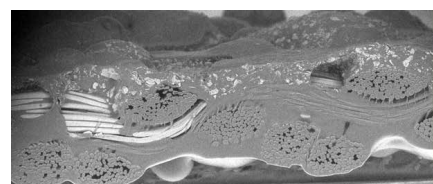
**Q: What are the load and temperature tolerances for Fenlon Asta liners?**



As the aeronautics industry is demanding more, they want their aircraft to go faster and have greater payload capacity. That puts greater pressure on aeronautics components suppliers. Thus, our customers need higher performance from their bearings. They will need to have greater load bearing capacity – up to 500 MPa. They will have to withstand wider temperature extremes, up to 482+ degrees. And, as per AS81820 Type A, they will need to be capable of reaching 100,000+ cycles, helping lower maintenance costs. In short, Fenlon Asta enables bearing products to test the limits of time and space. Go beyond where they've ever gone before and endure stresses and conditions that are totally new. To meet these demands, you need bearing liners that are not just innovative but something more. You need liners optimized for maximum bearing capacity, withstanding 250,000+ cycles, with the tightest tolerances possible...Fenlon Asta is the answer!

**Q: How do Fenlon Asta liners reach beyond 100,000 cycles?**

Of course our formulations and material science is proprietary...but I can expand on the Fenner advantage...It takes advanced material science not just to customize and manufacture state-of-the-art self-lubricating fabrics, but to specify, design, and fabricate them. We at Fenner Precision Polymers have advanced applications engineering expertise, including needs assessment and product design and development of finished materials. We have industry-leading manufacturing capabilities in weaving, warping, and coating fabrics and we have the widest range of yarns, fabrics, and resins, including PTFE, polyester, aramids, and fiberglass. We have state-of-the-art testing capabilities to ensure the finished materials meet your specifications. From resin development to lab testing and FEA testing to customer testing, the Fenlon Asta formulation consistently outperformed the other new formulations that Fenner considered addressing the most common complaint from customers working to achieve Type A qualification. The team, as a result,





— From resin development to lab, FEA, and customer testing, Fenner Precision Polymers applies state-of-the-art testing capabilities to ensure finished products meet customer specifications, including AS81820 Type A requirements.

met its goal of introducing a new bearing liner, Fenlon Asta, and developing a testing process that allowed Fenner to predict whether a specific liner would support a bearing manufacturer's goal of meeting AS81820 Type A requirements.

**Q: How can Fenlon Asta liners help bearing manufacturers achieve AS81820 Type A certification?**

Not only do we expect to meet but exceed 100,000 cycles, reaching as many as 250,000 cycles in particular end-use applications. To develop an alternative product that would more consistently meet the 100,000-cycle requirement, the company launched this new product development project relying on the skills of Fenner chemists and researchers, design, and production engineers. It involved customers and third-party researchers and drew on the expertise of Fenner's corporate parent, the Michelin Group, with some activities taking place concurrently over the three-year period. By documenting proven tribological performance in our published Fenlon Asta White Paper, our customers can feel comfortable we have done our homework up front to make their qualification and validation more reliable and efficient.... Success!

**Q: Lastly, how do you see the future of applications which require self-lubricating fabrics such as the Fenlon Asta Liners? What role will you and Fenner continue to play in creating these types of advancements for the bearing industry?**

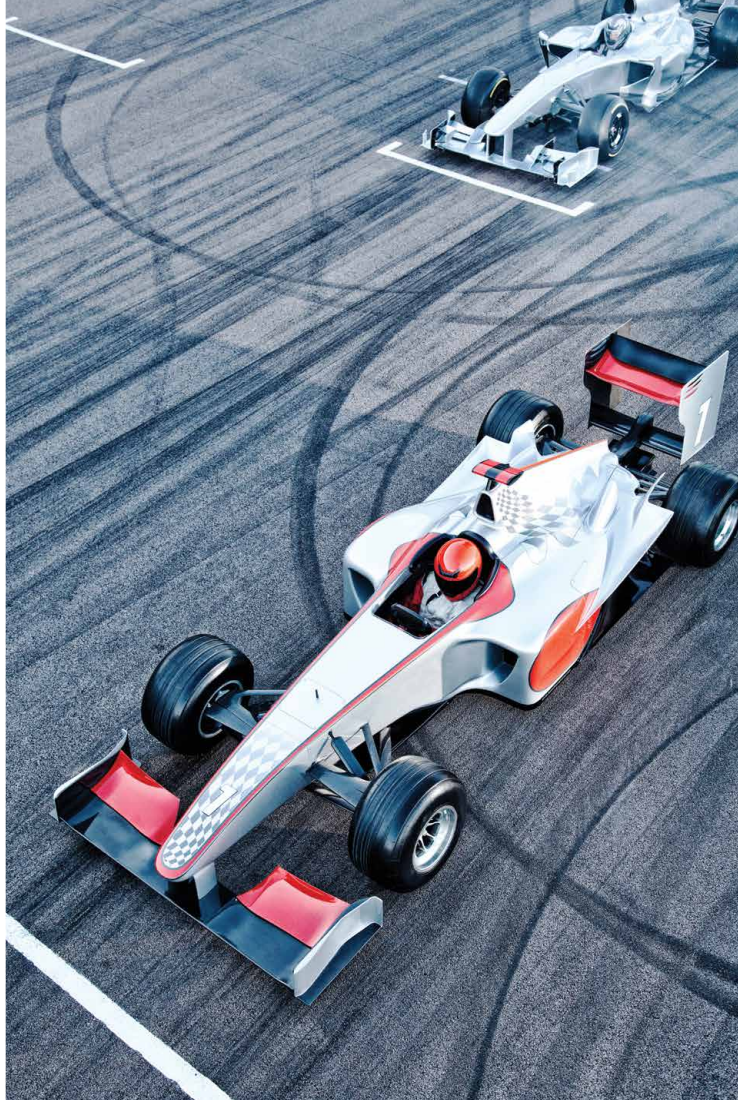
We provide a variety of Fenlon materials into exciting markets outside of the Aviation industry to include Automotive & Recreational Vehicles, Energy/Sound Dampening, Vibration/Noise reduction,

Seismic and Infrastructure to name a few. Fenlon Asta is being explored in some of these adjacent markets recently due to the improved and functional properties. New Product Development continues to be a pillar of the Michelin and Fenner -focused Strategy long term. Using the vertical manufacturing capabilities, technical knowledge and input from our global development team and the continued advancement of our material science capabilities, we are confident the Fenlon Asta project will not be the last... in fact we expect a new announcement soon for a completely different type of Fenlon product...more to follow!

*Thank you very much for the time and opportunity to offer my passion and enthusiasm for Fenlon products, Fenner Precision Polymers and the Michelin Group capabilities to Bearing News. Respectfully, Michael J. Knight*



*Michael J. Knight,  
Senior Product Manager,  
Technical Textiles Fenner Precision Polymers*



## Fenner Precision Polymers (FPP)

## Michelin 3<sup>rd</sup> Party research unfolded through the various stages of development

FPP decided to introduce a bearing liner product which could fulfill the stringent AS81820 “Type A” requirements. However, without the ability to build bearings, FPP was reliant on customer or external testing which was difficult to coordinate. As a matter of fact, by the end of the project external testing completely disappeared from the market. Thus, it was necessary for FPP to develop its own capabilities to test bearing liners for durability.

Michelin has extensive experience with durability/abrasion testing to predict tire wear performance, as well as personnel who specialize in test method development. A first version of the wear test was developed using existing tribometers at Michelin. This “alpha version wear test” was used to rank 7 potential bearing liners. The 7 candidates

were then tested using a now-defunct external test at Rexnord. The alpha test successfully predicted the performance of 6 out of 7 liners, narrowly missing the last liner. The Michelin test was not completely successful, and it was decided that a larger machine better suited for the high pressures bearing liners experience should be installed at Fenner.

A project was initiated to purchase a larger tribometer for use at Fenner, and work is ongoing to transfer the Michelin bearing liner test method to the new machine and to complete the validation.

By finding a new application for Michelin’s extensive equipment/personnel capabilities in wear test development a new capability was developed for FPP. By creating an internal bearing liner wear test FPP will

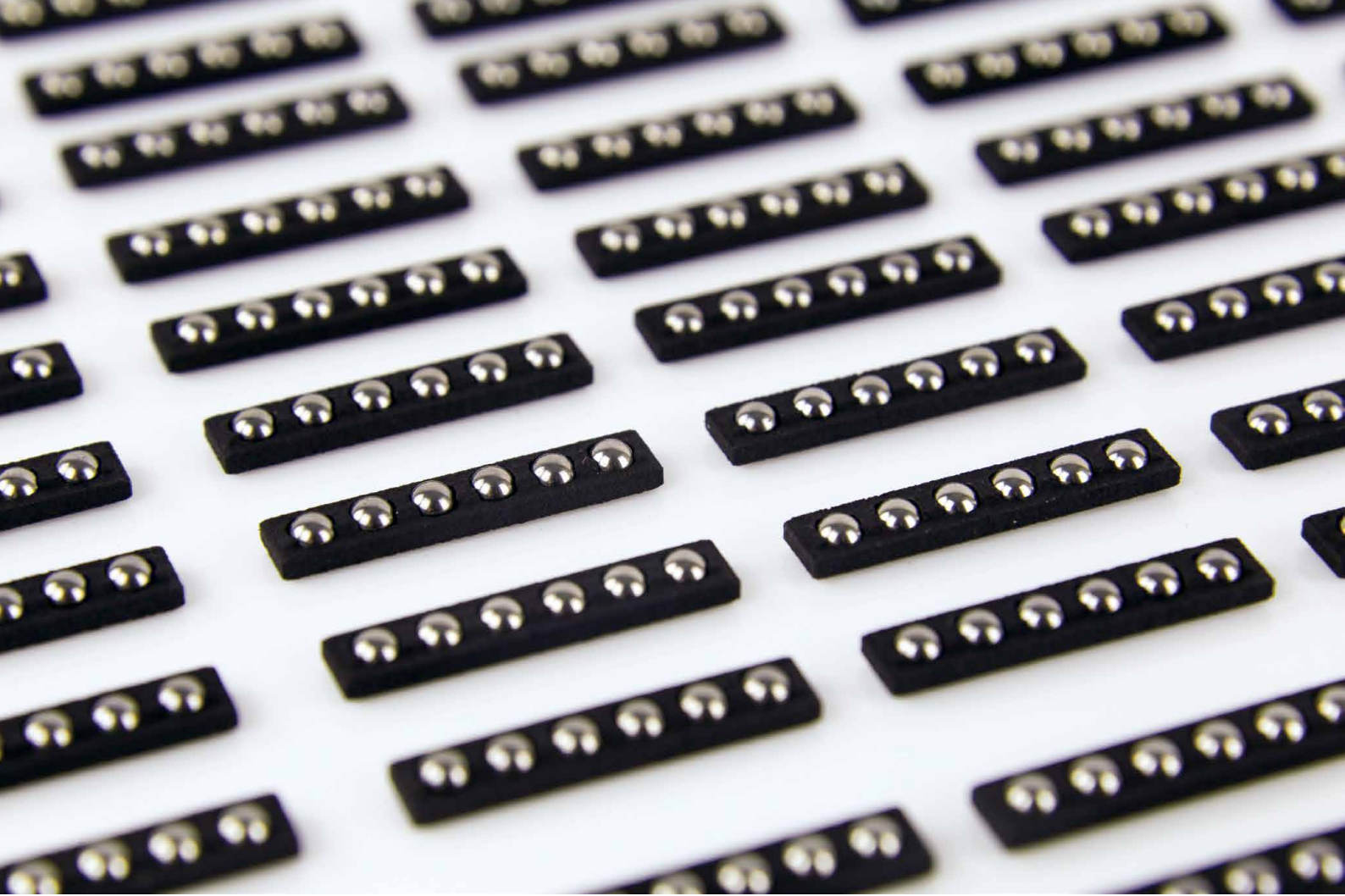
be able to anticipate customer needs for diverse markets and applications.

### **What would have been lost without this collaboration?**

Without combining the expertise of Michelin and FPP, the team would have had to design a wear method from scratch, which would have taken longer and could have yielded inferior results.

### **What specifically made the collaboration a key to the project’s success?**

The key to the project’s success was combining Michelin’s expertise (test development, wear performance, finite element modelling, microscopy...) with FPP knowhow about bearing liner formulation and design.



# Is Production Volume 3D Printing *Transforming* How We Think About Bearing Cage Design?

In 2021 Bowman International, a manufacturer of bearings and allied components, disrupted the split roller bearing market with a new product innovation containing 3D printed components – a design evolution that enabled Bowman's engineers to bring to market a world-first, high-load capacity split roller bearing.

By combining its knowledge of bearings, with its inhouse production 3D printing capabilities, Bowman has since developed a range of complex and niche bearing cages for applications all over the world.

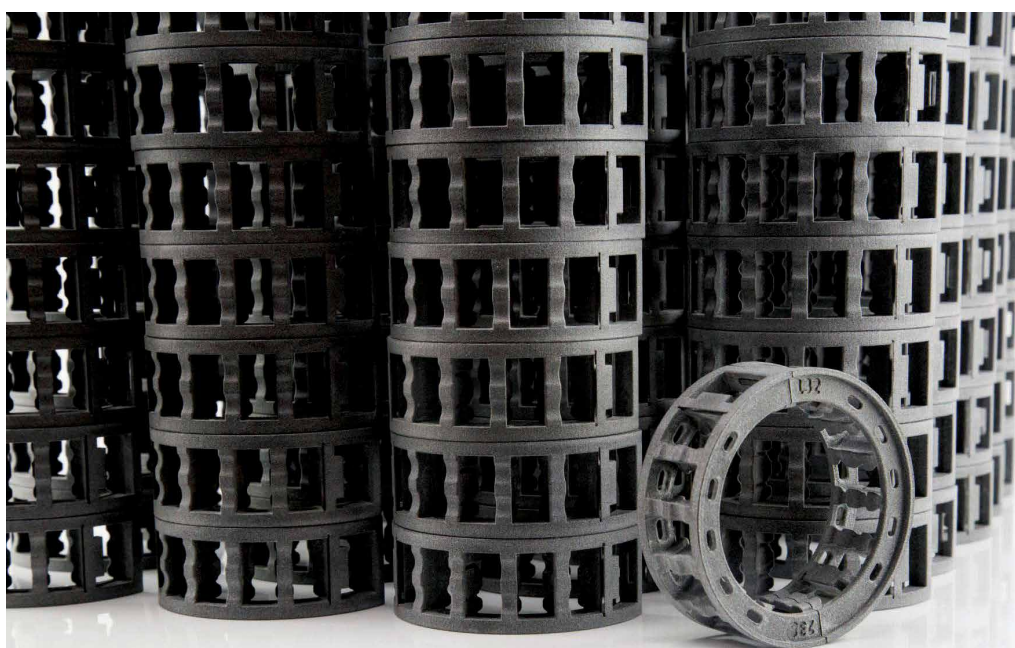


*Charan Prakash,  
Applications Engineer for Bowman's  
Additive Production division*

Here, Charan Prakash, Applications Engineer for Bowman's Additive Production division, explains how production 3D printing is transforming how we think about bearing cage design:

Bearings encompass a highly diverse range of components and finding the right design that not only optimises the performance but also eases manufacturability is challenging. This is especially important for more challenging environments, where perhaps bearing installation is difficult, legacy parts are no longer available on the open market, or there are high technical specifications that make off-the-shelf solutions unviable. These are the real industry issues we like to solve.

Until recently, the bearing industry designed cages within the confines of what was physically and financially possible using traditional manufacturing techniques and standard components, but production 3D printing has removed many of these boundaries.





the rollers in place, would continue to do so as the product was outstretched and snapped around the shaft.

Another example of leveraging 3D printing for easy bearing cage installation came from the US, when a customer asked us to redesign their product to accommodate a change in installation process. The original metal component comprised two cages that clipped together from either side, but Bowman AP was able to re-engineer the entire part into just one piece that fastened on one side only, making installation faster and more cost efficient.

Using 3D printing, our design engineers were able to create a range of iterations and prototypes within a very short two-week timeframe, requiring no upfront tooling costs. A new design was quickly agreed, successfully tested.

### **Broadening the horizons for cage complexity and performance**

3D printing increases the scope for component design, by making easy work of complex geometries that simply aren't achievable using production techniques. This allows us to recreate legacy parts for niche sectors, design bespoke bearing solutions for emerging markets and innovate performance-driven, production-volume 3D printed cages that, in many instances, perform better than conventional products. All of this is available in lower batch numbers, with incredibly short lead times and no upfront tooling costs.

Since innovating our own 3D printed cages to increase axial and radial load performance in a split roller bearing, we have supported the global bearing supply chain in overcoming a range of cage design issues. Let us examine a few use cases that really showcase the capabilities of this technology:

#### **Use case example: Easier installation thanks to 3D printed PA11**

Overcoming difficult installation scenarios is a common challenge and was in fact, a secondary consideration for our own split bearing innovation.

Another example came when we designed two simple needle roller bearings for the

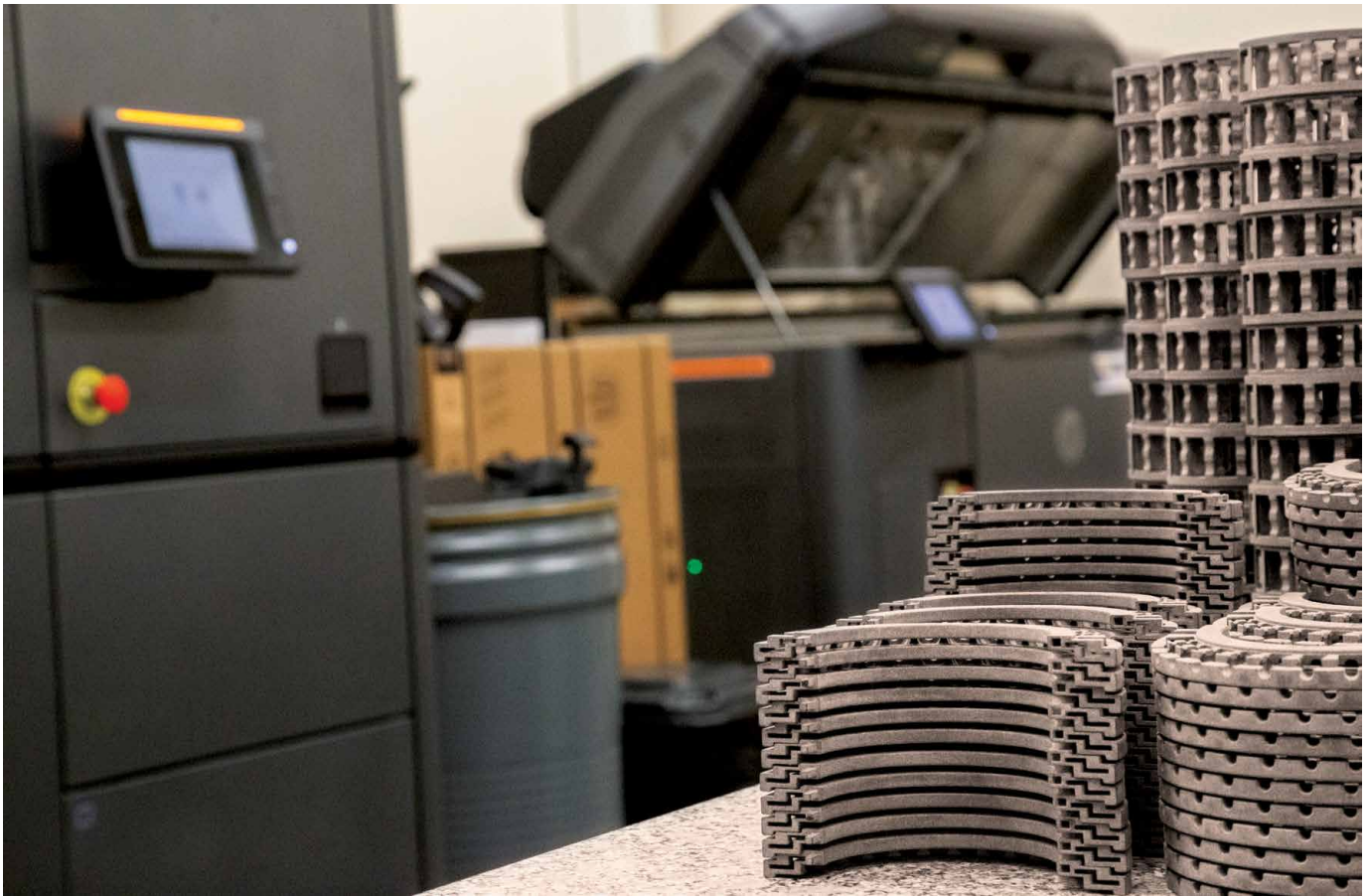
automotive sector - the smaller of the two being in a hard-to-reach location. Understanding that our printing material, PA11 is highly flexible, we engineered a split in the bearing that would allow the installer to simply stretch out the bearing and snap it around the shaft – a quick and uncomplicated solution that simply would not be possible when manufacturing with metal. An important consideration when designing this product was ensuring that the pockets responsible for holding

#### **Use case example: Serving niche sectors with small batches**

3D printing is growing in popularity within niche applications and sectors that find mainstream supply lines unable to produce a viable solution.

Recently, we have worked on solutions for several older bearing designs, in sizes that are no longer readily available for niche sectors that require smaller





batches. But, instead of simply replicating the old product, we took our usual engineering approach to component design and improved its performance with better designed roller pockets before reproducing it in small, frequent batches.

Our engineering expertise comes at no extra cost and is one of the things that sets us apart from the large scale “print houses” that dominate the 3D printing marketplace.

#### **Use case example: Performance enhancing characteristics**

In many recent designs we have successfully leveraged the capabilities of 3D printing to enhance the performance of the cages we produce. From increasing load capacity and improving L10 bearing life, to creating cages that require less frequent lubrication.

Without the limitations of traditional manufacturing processes or tooling, we are able to design cages that accommodate an increased number of rollers or balls to improve overall performance and uptime. This is a concept we used for our own

high-load capacity split roller bearings, as well as series of small strip roller bearings produced for the medical sector, where we improved the design of the pockets so that they could hold the ball bearings in place more effectively to improve overall bearing performance.

#### **Now is the right time to explore production 3D printing**

Gone are the days where 3D printing was a technique reserved solely for prototyping and hobbyists. The production 3D printing market is growing at a rapid pace, and while it is still in its infancy, it is important to select an established production 3D printing partner that offers an engineering approach to component design, rather than a print and post solution.

Leveraging Bowman’s undeniable expertise in the bearing sector, Bowman Additive Production is becoming a favoured service provider to OEMs and bearing manufacturers looking to harness the benefits of this modern production method. And in today’s economy, broadening the scope of design for bearing cages is not the only appealing benefit.

As material costs rise and lead times get longer, our ability to eliminate upfront tooling costs and guarantee short lead times of around two weeks, is fuelling the shift towards using 3D printing for component design and manufacture. Far lower minimum order quantities free up investment capital, and lower stock volumes means less transportation costs and less reliance on warehousing too.

Using 3D printing as a solution for bearing cage design is a trend that shows no sign of slowing, and off the back of its own successes, Bowman International is now leading the migration towards faster, cost-effective, performance-driven, 3D-printed bearing component design.



*For more information on how Bowman Additive Production can support your next design challenge, visit [www.bowmanap.com](http://www.bowmanap.com) or call 01235 462 500.*

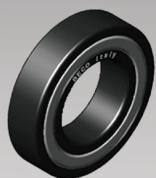


# BECCO

**THE *HOTTEST* BEARINGS IN THE BEARING INDUSTRY ARE NOW AVAILABLE AT GODIVA**



**EXTREME TEMPERATURE BEARINGS**



**HOT ON OUR SHELVES** the BECCO stock has landed, making high temperature bearings even more accessible to the trade.



**We'll take the heat...**

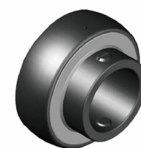
**...and you can sit back and relax!**



The BHTS ZZ heat-resistant bearing, which are the newest addition to our wide variety of bearings, can withstand temperatures between **-40°C** and **280°C**, making them suitable for most hot environments, including those found in the papermaking industry, food processing facilities, kilns, air conveyors, the ceramics industry, and the steel industry.

Our **TRADE ONLY PROMISE** is more than selling just to our trade customers, but also providing a fast and dependable service from placing the order to receiving the goods.

We make our range of bearing products available to our whole customer base, anywhere in the world, keeping you and your customers happy!



Contact our superhero team to see the full range available to purchase via telephone or our trade portal available on desktop, tablets and mobile devices.



**WWW.GODIVA-BEARINGS.CO.UK**



— New simatool BHT 200-400 in use

# Simple, fast and safe bearing handling thanks to simatool

The availability and optimal utilization of production facilities are the most important factors for the profitability of companies. Production and resulting yield losses due to unplanned plant shutdowns are no longer tolerated today. In order to reduce unwanted failures and allow planned maintenance intervals to be as long as possible, preventive measures must be taken. Rolling bearings are used billions of times worldwide and have become an indispensable part of mechanical engineering. Expectations of the service life of such bearings are correspondingly high and the service life depends on various factors.

The aim is therefore to implement the entire process of bearing dismounting, handling, mounting, lubrication and monitoring quickly, safely and easily. This is where simatec's innovative solutions can help.

Without the right special tools, professional mounting of rolling bearings and radial shaft seals is impossible. Did you know that 16% of premature bearing failures are due to improper mounting?

With simatool toolsets, rolling bearings and radial shaft seals can be mounted and dismantled quickly and safely. simatec ag has more than 30 years of experience in the manufacture and sale of innovative products for the assembly and disassembly of rolling bearings. Using simatec products ensures that bearings are installed correctly and that they reach their full performance potential in terms of quality and service life.

The focus of today's article is on the topic bearing handling.

**Product launch Bearing Handling Tool 200-400**

## What can a Bearing Handling Tool (BHT) do and what are its advantages?

The Bearing Handling Tool is ideal for the professional and safe lifting of large and heavy bearings. With the BHT, you avoid the risk of accidents and the risk of damaging the bearing. The simatool Bearing Handling Tool consists of two handles, two rotating handles and steel straps that enclose the bearing on the outer ring. By evenly tightening the handles in the two support arms, the steel bands are fixed to the outer ring diameter of the bearing. The two anti-rotation devices prevent the inner ring from swinging out in the case of angularly movable bearings (self-aligning ball bearings). Two opposing handles and two carrying straps allow easy handling with a lifting crane. Bearings can be placed on a shaft with the Bearing Handling Tool in both horizontal and vertical positions.

— New simatool BHT 200-400 with bearing inner ring holder



The bore remains free, so the bearing can be easily pushed onto a shaft. Additionally, the fixation of the bearing allows a more precise positioning. This guarantees simple, fast and safe bearing mounting on shafts.

The range has been completed with the type 200 - 400. This device is available from September 2022 and is suitable for cylindrical bearings with an outer diameter of 200 to 400 mm. The maximum lifting capacity is approved to 150 kg. The other two BHT 300 - 500 and BHT 500 - 700 mm are approved for lifting forces up to 500 kg. All three variants are tested and certified by TÜV SÜD.

#### Use with simatherm induction heating device possible?

simatherm heating devices efficiently heat rolling bearings and other ring-shaped metal parts. They enable quick and clean assembly and replace conventional heating methods such as hot plates, hot oil baths, open flames and ovens. During the heating process, only the workpiece heats up, but the device remains cold. simatherm induction heating devices are used for workpieces weighing up to 300 kg.

Bearing Handling Tools can be used to safely and easily lift workpieces onto or off simatherm induction heating units. The Bearing Handling Tool can be used for inner

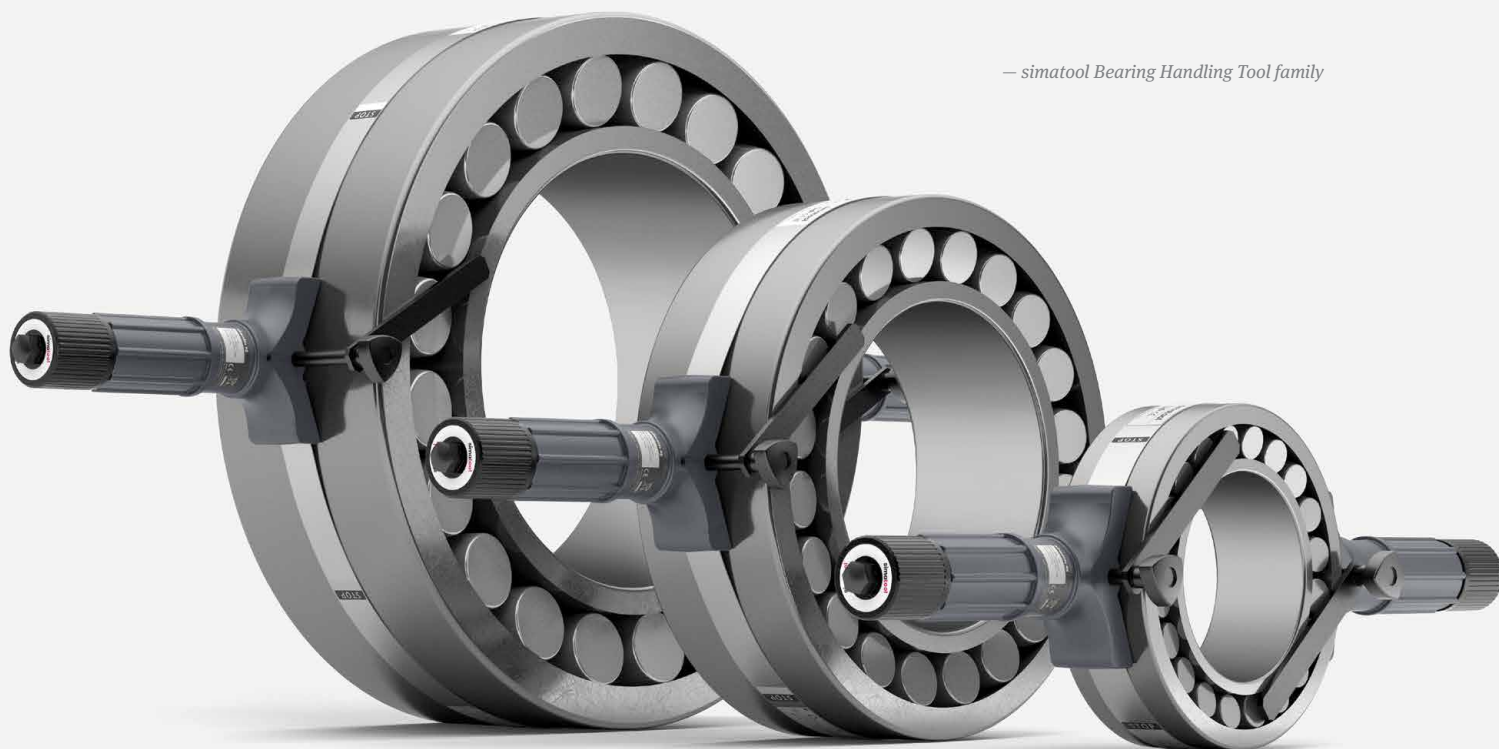
ring temperatures of up to 160°C. Before lifting the bearing from the heater, the final tightening torque must be checked.



— Bearing handling tool on induction heating device

The use of simatec maintenance products results in the following benefits for users: Easy handling, increased work safety, increased service life of components as well as cost reduction due to fast and proper installation and removal.

*Have we aroused your interest? You can find more exciting articles and detailed information about our simatec products at [www.simatec.com](http://www.simatec.com)*



— simatool Bearing Handling Tool family

# GO TO **extremes**

Ceramic bearing technology makes it possible

EXTREME CORROSION RESISTANCE

EXTREME PERFORMANCE

EXTREME ENVIROMENTS

EXTREME TEMPEATURE

Boca Bearings carries over 9,000 products,  
with over 10 million items in stock right now.

**Boca Bearings. Specializing in ceramic technology.**

SHOP US FIRST





# SCHAEFFLER

**INTRODUCING...**

## **FAG BLACK SERIES**

**RADIAL INSERT BALL BEARINGS AND HOUSING UNITS**

- ECONOMICAL
- EASY MOUNTING
- SMOOTH RUNNING AND HIGHLY RELIABLE
- MADE TO JIS B JAPANESE STANDARD SIZES
- ANTI CORROSION DUROTECT BS COATING AS STANDARD
- SUITABLE FOR A WIDE RANGE OF INDUSTRIES



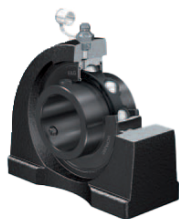
Radial insert ball bearings with grub screws in inner ring



Radial insert ball bearings with adaptor sleeve



Plummer block housing units with flake graphite cast iron housing with long base



Plummer block housing units with flake graphite cast iron housing with short base



Two-bolt flanged housing units with flake graphite cast iron housing



Four-bolt flanged housing units with flake graphite cast iron housing



Take-up housing units with flake graphite cast iron housing

[dudley@godiva-bearings.co.uk](mailto:dudley@godiva-bearings.co.uk)

+44 (0) 1384 240 005

**WWW.GODIVA-BEARINGS.CO.UK**

# ER



Just over **30 years strong**, Godiva's and Schaeffler's relations are stronger than ever, with a continually expanding product range. We are the largest stockist of INA & FAG products in the UK which is readily available to purchase and dispatch same day.

With over 300 years of combined sales experience within our Dudley & Newcastle teams, we identify and interchange from all the worlds' manufacturers no matter what age the part is as well as offering technical support and backup when needed!



**WE ALSO STOCK...**

## CONCEPT 1 AUTOMATIC LUBRICATORS

### FLEXIBLE

Pre-filled cartridges with ARCANOL lubricant or empty cartridge for filling with customer's grease

### SUSTAINABLE

Empty cartridges can be filled up to three times and are environmentally friendly

### COST-EFFECTIVE

Good price-performance ratio within comparable equipment class.



OPERATES FROM -20°C TO 55°C

[newcastle@godiva-bearings.co.uk](mailto:newcastle@godiva-bearings.co.uk)  
+44 (0) 191 272 5225

**FOLLOW US ON OUR SOCIALS - @GODIVABEARINGS**



**KUKKO // Pull forward**



# Any Bearing calls for a pulling specialist.

Made-to-measure pullers and even tailor-made solutions to remove and install bearings and seals.

This picture shows removal of the impeller to get to the defective bearing. It is a custom-made solution for Ben's Ginger GmbH, a ginger juice production in Bavaria.

Original and premium pullers created by KUKKO.





# Outer Space

## The Ultimate Test Of High Quality Bearings

One of the most critical bearing applications in the aerospace industry is where machinery requires motion control on manned space flight missions and it's currently experiencing significant investment and growth. Despite all the global challenges and uncertainties, the UK and European space sector is thriving, a good example of which is the Oxford Space Cluster. This facility is acknowledged as the UK's leading space technology gateway with a global reputation for innovation, from space science research to ground based commercial solutions. Today, the Harwell Space Cluster forms an integral part of the UK's space sector having grown into a dynamic and enterprising ecosystem comprising of over 100 organisations, employing 1400 people and contributing £5.7bn to UK GDP.



Located in close proximity to the Harwell site is Oxfordshire based **precision bearing specialist CARTER MANUFACTURING** who are the European Master distributor for the renowned **USA based Napoleon Bearings**. With over 25 years of service and excellence in the aerospace manufacturing industry, Napoleon offers customers the crucial benefit of 'Space Heritage' a status that is critical to being considered a supplier to the space industry sector. This is underlined by the fact that Napoleon has supported both NASA missions in the USA and also projects initiated by the European ESA by supplying components for life-critical space applications.

Thanks to its representation of Napoleon Bearings, who are regarded as one of the manufacturers of choice for the most critical bearing applications, enables Carter to pass on unrivalled expertise gained from manned USA space flight missions, to similar projects for their UK and European customers. As a result, from low earth orbit to Mars exploration and beyond, outer space approved bearings, along with other key components, are helping customers to explore and conquer new frontiers with confidence. In addition to supplying the highest

specification bearings to UK and European customers, Carter have also supplied components such as Cam Followers for the Mars Rover project, Rod Ends and aerospace bearing tools for the Thales satellite project along with bearings for deployable antennas for other space exploration projects.

Other specific aerospace applications in which Carter has supplied products includes; launch vehicle satellites, LOX turbo pumps and circulators, liquid methane pumps, reaction wheels, solar array gear box mechanisms, door latches and other space components.

For Worldwide customer peace of mind, Carter is accredited to **ISO9001**, incorporating the requirements of **AS9120** with flow down from **AS9100**, while bearings can include **AS9102** Aerospace First Article Inspection. This includes reports for traceability of all raw materials and special processes along with full dimensional analysis. In addition to providing customers with the confidence of our levels of accreditation Carter also offer extensive knowledge of the quality and testing requirements which are required to validate a new bearing design or other components.

Carter's engineers utilise SolidWorks to design custom bearings tailored to each mission, whilst their proprietary bearing application software determines theoretical bearing performance. To complete the package, other software allows us to provide detailed reports to better inform our customers and validate critical design decisions. We can also provide further technical assistance such as FEA analysis and this level of support, combined with our unique understanding of how to interpret this data, optimises mechanical performance.

More at: <https://www.carterbearings.co.uk/industries/space>

#### For enquiries

##### Call:

**UNITED KINGDOM** : +44 (0) 1865 821 720  
**EUROPE** : +34 960 130 938  
**NORTH & SOUTH AMERICA** : +1 888 501 5444

##### E-mail:

[sales@carterbearings.co.uk](mailto:sales@carterbearings.co.uk)

##### For details, visit:

[www.carterbearings.co.uk](http://www.carterbearings.co.uk)

# SDT340

Data Collector

Detect, Measure, Analyze

**Ultrasound and  
Vibration**



Ultrasound Solutions

[sdtultrasound.com](http://sdtultrasound.com)

Powerful flexibility to  
organize your condition  
monitoring strategy

## UAS3

Analysis Software

### APPLICATIONS



#### MECHANICAL

Detect defects in any mechanical system.



#### LEAKS

Find pressure and vacuum leaks in noisy conditions.



#### LUBRICATION

Avoid over/under lubrication. Grease bearings right.



#### ELECTRICAL

Inspect medium and high voltage systems for arcing, tracking and corona.



#### VALVES

Assess valve tightness and function



#### STEAM

Find faulty steam traps and leaking components.



#### HYDRAULICS

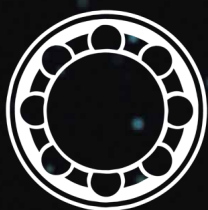
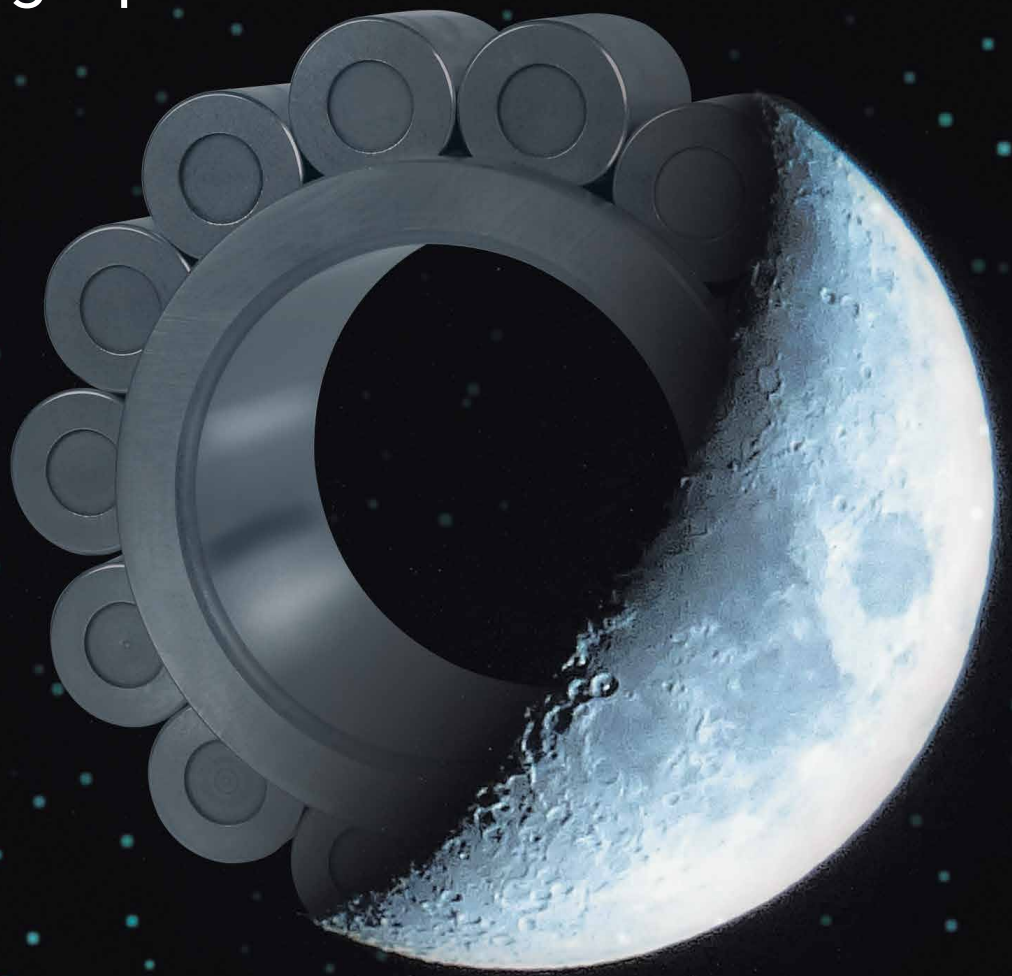
Troubleshoot any hydraulic system for passing and blockages.



#### TIGHTNESS

Determine the tightness of any enclosed volume.

makes things possible



**CPM**

**SPECIAL BEARINGS**

[www.cpmbearings.com](http://www.cpmbearings.com)



# thyssenkrupp rothe erde starts CO<sub>2</sub>-free production of Bearing Rings

— image: thyssenkrupp rothe erde Germany GmbH

The **"CO<sub>2</sub>-free ring production"** project started with the development of a transformation concept for the decarbonization of the heating and heat treatment furnaces at thyssenkrupp rothe erde facilities in Dortmund, Germany.

The energy transition and the associated need for decarbonization poses a variety of challenges for many companies, especially to those companies with energy-intensive production processes. On the one hand, the question arises on which alternative technologies are and will be available in the future and what potential these technologies offer for decarbonization; while on the other hand, it must remain economically feasible to implement the CO<sub>2</sub>-free production processes.

The CO<sub>2</sub>-free ring production project started on May 1, 2022. The work is being financed by thyssenkrupp rothe erde Germany GmbH in support with the Federal Ministry of Economics and Climate Protection as part of the "Transformation Concepts" initiative, which will run for a period of nine months.

The aim of the project is to record the current CO<sub>2</sub> footprint of ring production at the Dortmund production site, to analyse

the future potential for the availability of CO<sub>2</sub>-free energy sources and the technical possibilities and the resulting options as part of a scenario-based feasibility study using technical and economic key figures to compare with each other. The focus is in particular on the heating and heat treatment furnaces for the bearing ring production. The work serves to create a CO<sub>2</sub>-free production transformation concept for the thyssenkrupp rothe erdes' Dortmund site.

At the start of the project, specific key figures for the plant are collected and analysed and the annual CO<sub>2</sub> emissions and energy costs are determined. This is followed by the analysis of the infrastructural and economic framework conditions at the location with regards to the future availability of CO<sub>2</sub>-free energy sources and the creation of possible scenarios for the expected developments in the framework conditions and infrastructure up to the year 2045.

The results will lead to the comparison and evaluation of the CO<sub>2</sub>-free technologies for different development scenarios and the derivation of a transformation strategy at the site. Furthermore, the energy consumption, the CO<sub>2</sub> emissions and the heat generation costs are compared.

This creates a qualitative and quantitative decision-making basis for the selection of future CO<sub>2</sub>-free technologies for the heating and heat treatment furnaces in ring production based on different criteria. These will form the basis for the derivation of an action plan for the achievement of goals and the transformation options for CO<sub>2</sub>-free ring production at the thyssenkrupp rothe erde Dortmund facilities.

More information about this project can be found at Aachen University (RWTH Aachen) website [www.iob.rwth-aachen.de](http://www.iob.rwth-aachen.de)



# GODIVA BEARINGS

We are TRADE ONLY - here for you 24/7, 365 days a year

## **SUPERHEROES OF THE BEARING INDUSTRY**

- 24 hour call out service
- WORLDWIDE sourcing
- TRADE ONLY!
- Global export
- Dedicated account managers
- Delivery available for NEXT or SAME day
- Over £10 million worth of stock on our shelves



## **GODIVA'S TRADE ONLY PORTAL**

### **NOW LIVE!**

Over 53,000 different products in stock

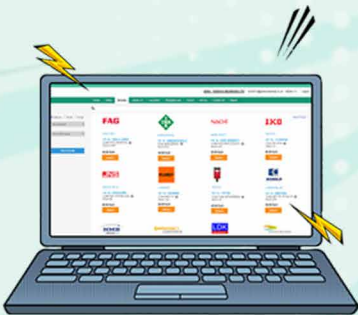
Browse & order 24/7 from any location worldwide

Accurate export documentation as standard

Late cut off times

Comprehensive built in product interchange

Vast library of image and datasheets



**AVAILABLE 24/7 ON YOUR  
DESKTOP AND MOBILE APP  
FOR WHEN YOU ARE ON THE  
GO!**

**VIEW PRICES,  
STOCK LEVELS  
DATASHEETS  
AND MORE**



**WWW.GODIVA-BEARINGS.CO.UK**

# NSK Team Stories: World's First 100% Bioplastic Bearing Cage Supporting Carbon Neutrality with Environmentally Friendly Products

NSK is committed to realizing a carbon-neutral society. As part of these efforts, in November 2021, NSK developed the world's first bearing equipped with a cage made of 100% plant-derived bioplastic for use in air conditioner fan motors. In this issue, we talk to the engineers behind this development about the background of the project and what drove them.

Nariaki Aihara



Group Manager Technology Research  
& Development Office 2  
Core Technology R&D Center

Shintaro Honda



Technology Research & Development Office 2  
Core Technology R&D Center

Hiroshi Ishiwada



Group Manager Electrical & Electrification  
Bearing Technology Center Industrial  
Machinery Technology Development Center

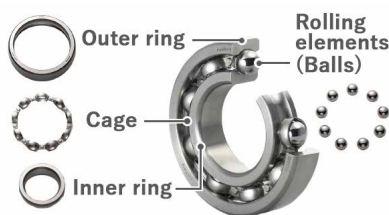
Takki Yoshima



Electrical & Electrification Bearing Technology Center  
Industrial Machinery Technology Development Center

## 100% bioplastic bearing cage developed

**Aihara:** NSK has always been committed to protecting the global environment, as indicated in its Mission Statement. Over the decades, this commitment has driven the development of many environmentally friendly technologies, products and materials. NSK's bearings—our mainstay product—are intrinsically eco-friendly because they help save energy by reducing friction and smoothing mechanical movement.



— Bearing structure

Our team carries out research into the plastic and rubber materials used in NSK products. In order to reduce CO<sub>2</sub> emissions related to bearing materials, we developed a cage comprised only of bioplastic, which is produced entirely from renewable plant resources. Bearings are composed of balls or rollers (rolling elements) between the inner and outer rings. A cage is used to space the rolling elements at regular intervals and enable the bearing to rotate smoothly. The cage is therefore a critical component of the bearing.

**Honda:** Plastic derived from fossil fuels is typically used to make these cages. This plastic is made from petroleum pumped from the ground, a process which releases CO<sub>2</sub> into the atmosphere. CO<sub>2</sub> is also emitted when the plastic is incinerated at the end of the product's lifespan. In contrast, the bioplastic cage we developed

uses sesame plants as the raw material for the plastic. Since plants absorb CO<sub>2</sub> from the atmosphere during photosynthesis, even if CO<sub>2</sub> is emitted during incineration of bioplastic, it will be no more than the amount initially absorbed by the plants. Therefore, bioplastic CO<sub>2</sub> emissions are basically net zero. Bioplastic raw materials are produced by cultivating, harvesting and processing plants, and these processes emit less CO<sub>2</sub> than the processes used



— Made from sesame plants

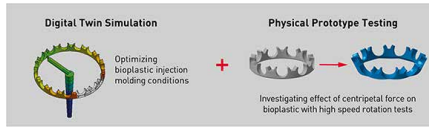
to make plastics from fossil fuels. Our bioplastic cage can reduce CO<sub>2</sub> emissions by 91% over the product lifecycle compared to conventional cages (polyamide 66).



—100% bioplastic bearing cage

NSK has been developing and manufacturing bearings for over 100 years. We made the most of our expertise to develop a cage made of environmentally friendly materials without any compromise to quality. A bearing cage needs to be strong enough to withstand heat and load when in use. At the same time, the material needs to be easy to mold and also flexible enough to bend during bearing assembly. We leveraged materials technology, one of NSK's Four Core Technologies, to evaluate the potential of new materials to meet the requirements for bearing cages. The result is environmentally friendly cage that also delivers heat resistance and strength comparable to a conventional one.

**Aihara:** We also employed NSK's digital twin technology in the development of the new cage. NSK uses the digital twin approach to achieve high quality and efficiency in product development. Digital twin technology helps create innovative, unexpected solutions, and utilizes both the ability to gain insight into phenomena occurring in the real world, and the ability to apply reasoning by using technology to create a digital model and understand the essence of the underlying issue. We began by using digital technology to analyze how the material might behave, and predicted its molding potential and likely performance. By then creating a real prototype based on the digital results, we eliminated the need to make multiple prototypes, shortening the trial and error process. This made the development so efficient that it only took one-third of the usual time. As environmental awareness grows, I am delighted that we were able



— Hospital corridor

to rapidly develop this world-first product to help promote carbon neutrality.

#### Demonstrating product value to customers



**Honda:** I hope that this new product will help draw more attention to bioplastic as an environmentally friendly

material. Since it was my first product development project, I'm excited to tell everyone about it in this way, and I guess I also feel a responsibility to keep pushing forward (laughs). Although eco-friendly materials can also mean higher costs, going forward I want to help develop products that can reduce both environmental impact and costs. I will continue working with the needs of our customers in mind.

**Aihara:** I had previously been involved in developing biodegradable plastics that can be used in bearings.

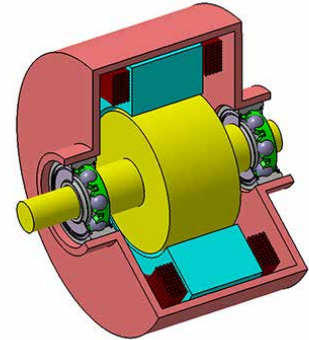


When left in the ground, biodegradable plastic decomposes and returns to nature. Unfortunately however, our prior product developments did not translate into sales. I want to promote widespread adoption of this product by communicating to our customers that the benefits of this new product are worth the cost. There are always reasons for the way things turn out, so I would like to carefully review our past and present projects and find ways that NSK can expand its initiatives in this area.

#### Next steps in the development of bearings with bioplastic cages

**Ishiwada:** Bearings with the new bioplastic cage have now been adopted for use in air conditioner fan motors. Air conditioners have a built-in fan to generate

air flow, and bearings are used in the fan motor to help it rotate smoothly, which in turn reduces the motor's electrical use and saves energy. Since air conditioners are used in living spaces, the equipment needs to be as quiet as possible. This is why the bearings must rotate smoothly and silently. Reliability is also important because longer bearing life means allows the air conditioner to operate quietly over a span of several years.



— Two bearings in each fan motor

**Yoshima:** In the air conditioner market, the COVID-19 pandemic has fueled greater interest in indoor air quality. Demand for replacement air conditioners with advanced features such as ventilation and purification is expected to increase in developed countries. Air conditioner ownership in China, India, and other emerging countries is also expected to increase as incomes rise. Air conditioners often have a high market penetration rate and use a lot of electricity, which makes them a good target for eco-friendly initiatives. By offering bearings with bioplastic cages for air conditioners, we can not only provide the same quietness, high reliability, and energy saving as bearings with conventional plastic cages,



— Bearing with world's first bioplastic cage

but also deliver added value in the form of environmentally friendly materials.

Changing to a bioplastic material can have a huge impact on productivity and the accuracy of molding dimensions, so the shift represented a major product modification. By utilizing NSK's digital twin technology, we were able to simulate conditions at the time of molding and any potential problems that could arise when using conventional production equipment. We then verified and confirmed the product quality through test production and evaluation. As a result, we were able to develop a bioplastic cage with the same performance as a conventional one in just six months. Moreover, we maintained the same performance as the conventional plastic, including the lightweight, low-friction properties and the dynamic molding capability.

### NSK will continue developing bearings to meet the needs of the future



#### Ishiwada:

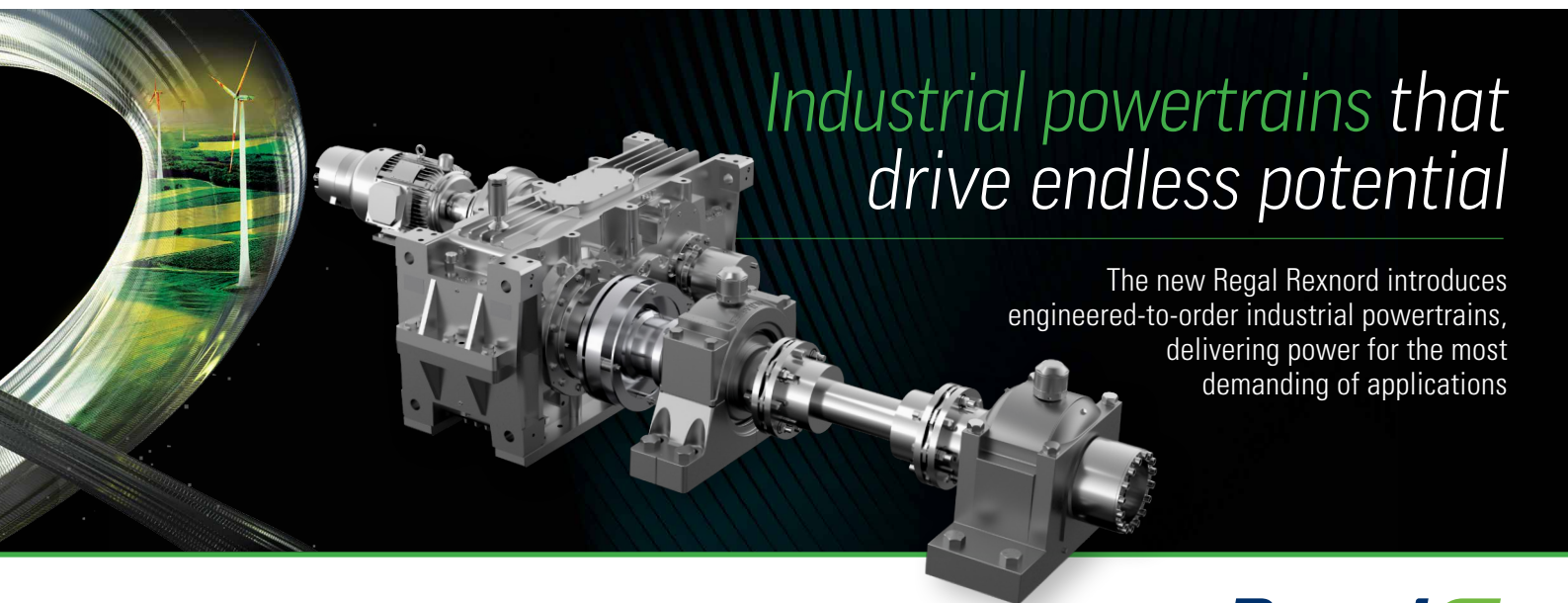
Bearings fitted with a bioplastic cage enable us to market our products by appealing to the new added

benefit of environmental design. Going forward, I am keen to look into using environmentally friendly materials for other bearing components such as rings, grease, and seals. Along with parts for industrial machinery, such as air conditioners, our team also designs bearings for vehicle electrification. Based on market trends such as vehicle electrification and broader use of IT, bearings will need to incorporate even more advanced technology. I would like to help create bearings that support

the environment while also offering even greater product performance.

#### Yoshima:

Customers have expressed interest in our new bearing as an environmentally friendly product, and some have already requested samples. I would like to continue working to develop this product range with support from across NSK. At the same time, we will closely follow societal trends so that we can anticipate customer needs and move quickly to offer them the right products.



## Industrial powertrains that drive endless potential

The new Regal Rexnord introduces engineered-to-order industrial powertrains, delivering power for the most demanding of applications

It took the combined strengths of our new company to develop complete industrial powertrain solutions, custom designed and built for applications across the full spectrum of horsepower and torque. From start to finish, Regal Rexnord™ electromechanical industrial powertrains are designed, configured, integrated and optimized for your unique applications, opening the door to new ideas and unlimited possibilities.

Read about Regal Rexnord and our prominent brands. Go to [regalrexnord.com](http://regalrexnord.com).

Rexnord® | Sealmaster® | Stearns® | Kop-Flex® | Falk®

Link-Belt® | Marathon® | Perceptiv™ | Browning® | Tollok®

**Regal Rexnord**

Creating a better tomorrow™...

# When bearing relubrication is not a DIY job

## *The technological secrets of relubrication facilities*

If you are changing the bearings on a skateboard, you can do it in your garage with a pair of tweezers. For many applications though, the process of relubrication requires precision, expertise and sophisticated technology. Here, Chris Johnson, director of bearing relubrication specialist SMB Bearings, examines some of the specialist equipment you might find in a bearing relubrication facility.

As a specialist bearing supplier we used to receive requests for bearings with non-standard lubricants, or for help with relubrication. For smaller or mid-volume orders, larger manufacturers were often unwilling to offer this service. We wanted to help and so, around thirty years ago, we established our own inhouse bearing relubrication facility.

Over the years, our expertise in this area has grown exponentially and we have acquired a range of sophisticated equipment. If you want to know more about the kind of technology and equipment you can typically find in a bearing relubrication facility, here are five key elements, plus one that is so secret I can't really tell you too much about it!

### **Cleanroom environments**

For precision applications, it is imperative that the process of relubrication takes place in an environment free from potential sources of contamination. Particles far smaller than the naked eye can see could easily compromise the working of a bearing if they are allowed to enter and contaminate the lubricant.

A good relubrication facility requires filtered air. Although in most cases it is not necessary to have a certified cleanroom, many customers, particularly those involved in the manufacture of electronic, pharmaceutical or medical products to name a few, should expect a facility that can offer a highly controlled environment,



free from sources of contamination and akin to a cleanroom environment.

### **Ultrasensitive scales**

In some applications, the quantity of grease is just as important as the type of grease in ensuring the performance of the bearing. For example, while a standard fill might be 30

percent, for certain low torque applications this would be too stiff and a customer might need a ten percent fill instead. When dealing with miniature bearings and quantities on this scale, you have to be very precise. A job like this requires high-tech specialised scales, that are ultrasensitive and capable of providing the necessary level of precision.

### Ultrasonic cleaning equipment

Degreasing or cleaning out the bearings is just as important as adding in the fresh lubricant. If the process of degreasing is not carried out in the right way, traces of the old grease can remain and cause problems. In addition to special solvents and chemicals, relubrication specialists might use ultrasonic cleaning technology. Ultrasonic waves cause cavitation and the tiny bubbles released in this process provide a gentle scrubbing effect on the surfaces.

### Ultraviolet inspection

Standard greases can become combustible in high oxygen environments. This reiterates the importance of degreasing properly, with the right chemicals and equipment, to avoid potentially explosive consequences. Bearings used in oxygen systems, such as those found in medical applications for example, should not have any hydrocarbon-based oil in the lubricant, due to the risk of spontaneous combustion. Making sure the

bearing is properly cleaned out is therefore essential. Having cleaned a bearing, a specialist can use ultraviolet light to ensure no traces of potentially combustible material remains, as hydrocarbons will fluoresce under this light.

### Dry lubricants

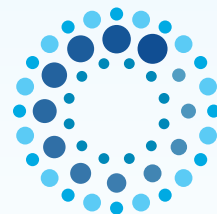
Relubrication specialists are often called for because of the need for a specialist lubricant. Often, a problem with a bearing could be easily resolved with the correct lubrication. One interesting area here is dry lubricants. The inner surfaces of a bearing can be coated in dry coatings, such as molybdenum disulphide, which will help prevent micro-welding between steel surfaces in vacuum environments. If you need dry lubricants to be burnished or sputtered on to the balls or raceways of a bearing, this is something that requires specialist expertise, particularly in precision applications such as those being specified for vacuum environments.

### Top secret

Some of the technology that might be deployed in a relubrication facility is so sophisticated that full details of its operation cannot be disclosed. For example, at SMB Bearings, we have proprietary technology that allows us to relubricate bearings without removing the shields. Customers who need a specialist service like this can inspect the facility to see the equipment in action and assure themselves of its efficacy. However, they must sign non-disclosure agreements to make sure the secrets stay with the experts.

From ultrasonic cleaning devices to secretive technology that can degrease a bearing without removing the shields, a modern relubrication facility has an impressive array of equipment. If you don't have the expertise or access to the right equipment, stay clear of botched DIY jobs and rely on the experts.

*SMB Bearings is a specialist supplier of miniature bearings with its own inhouse relubrication facility. To find out more, visit [smbbearings.com](http://smbbearings.com)*



## BEARING & POWER TRANSMISSION WORLD MEETINGS

7-9 June  
**2023**  
**Istanbul**

for more details contact:  
[info@bearing-news.com](mailto:info@bearing-news.com)





[www.ict-advisorydivision.com](http://www.ict-advisorydivision.com) – [m&a@consulting-trading.com](mailto:m&a@consulting-trading.com)

# **The reference Advisor for all M&A operations in bearings industry!**

EUROPE | ASIA | AMERICA



Company  
Acquisitions

Partnerships  
Joint-Ventures

Company  
Sales

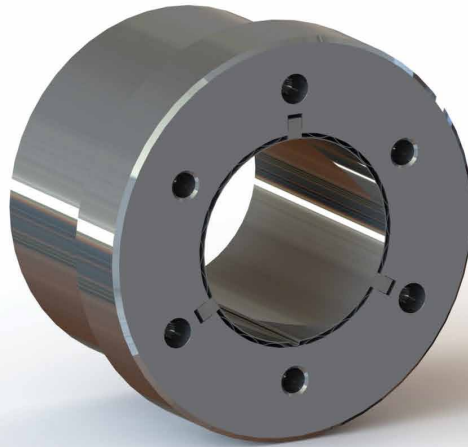
Company  
Restructuring

IPO

Financial & Legal  
Due Diligence

Business  
Due Diligence





# Insights on OAV Air Bearings for high-speed-high-temperature Turbomachinery

To address the environmental issues arising from the disposal of exhausted lubricating oils/grease of conventional oil journal/rolling element bearings, there is a need for explorations to develop environment-friendly, energy-efficient, and maintenance-free air bearings.

These bearings use air as the lubricating medium, which is freely available in nature and has non-degradable properties. Using atmospheric air as lubricant eliminates the need for complex oil supply systems. The high speed of the rotor and the sub-ambient condition in bearing drag the atmospheric air inside the convergent zone leading to the pressure generated in the air film, which supports the loaded rotor. These bearings possess compact and simple geometry; yield low friction, low noise, and insignificant heating; operate in oil/grease-free environments at high speeds. Presently, these bearings are found in micro-turbomachines such as turbo-pumps of space launch vehicles, environment control units of fighter and commercial aircraft, turbo-chargers of

high-speed automobiles, PCB manufacturing instruments, dental handpieces, and in the food-processing and pharmaceutical devices, where oil/grease cannot be used.

Despite the eco-friendly nature of the air bearings, such bearings also suffer from several drawbacks preventing their large-scale industrial use. Rotors supported on such bearings are typically light, operated for shorter durations, and most importantly, rotors supported on such bearings show poor dynamic behavior due to fluid-induced instabilities. Thus, in pursuit of developing aerodynamic bearings for operating at high loads (comparable to oil bearings) with improved rotordynamics, attempts are being made by the OAV Air

Bearing team to conceive new bearings with modified bores. The patented air bearings by the OAV Air Bearing have shown significant improvements in both tribological and dynamic performances. OAV Air Bearing is the leading manufacturer of both aerostatic porous and aerodynamic gas foil bearings, adhering to a promise of a standard above excellence. OAV Air Bearing is committed to supplying top-quality industry standard precision air bearings, which require excellent engineering, clever design, and outstanding manufacturing technology.

*OAV Aerodynamic Foil Bearings Lead  
Engineering Team*  
**OAV Air Bearings**  
HQ Princeton NJ USA

NEW  
**VISIO**

The new way of  
**automatic lubrication.**



Discover how can Memolub®  
**upgrade** your maintenance process at [www.memolub.be](http://www.memolub.be)

**ONE** **EM** **HPS** **EPS** **PLCD** **DS**



# ICT expands its bearing industry operations to North America

ICT srl leading consulting company specialized in providing technical and commercial services to the bearings industry, is considering to open its own subsidiary in USA to replicate its business model started 10 years ago in Europe. The aim is to offer also to North American bearings industry following products/services:

- High precision bearing components (steel and ceramic balls, rollers, cages, shields, seals, rings)
- Special components in ceramics and special steels for aircraft bearings
- Grinding and dressing tooling
- Grinding, assembly and control machinery for bearings manufacturers
- Technical consulting on special processes and lean manufacturing
- Good knowledge of the bearings industry in North America;
- Minimum 10 years of professional experience in bearings companies, possibly with different roles;
- Good know-how in high precision mechanics sector in general;
- Currently he/she runs his/her own business as entrepreneur and/or freelance consultant;
- Open minded, ethical, enthusiastic and capable to transmit energy to collaborators, customers and partners.

Within such project ICT is actively looking for US partner(s) who will to be active part of the new branch and have ideally the following characteristics:

On its side, ICT offers a consolidated and contractualized network of partners and collaborators in Europe and in Asia, an established brand and an excellent reputation in the bearing industry together with high quality products made available at competitive prices.

*Who is interested to know more about the project can get in touch with us writing at [info@consulting-trading.com](mailto:info@consulting-trading.com) (indicating "ICT subsidiary in USA" in the e-mail subject) or calling at +39 (0)121 376811.*

CELEBRATING



1968 - 2018



**KING TIGER**

**1** **NUMBER ONE** in Quality  
in Durability  
in Performance

**STRENGTH**  
OF A **TIGER**



Adapter  
Sleeve



Hydraulic  
Adapter Sleeve



Withdrawal  
Sleeve



Hydraulic  
Withdrawal Sleeve

## BEARING SLEEVE SOLUTIONS



Lock  
Nuts



Lock  
Washer



Hook  
Spanner

## PRECISION SERIES LOCK NUTS



KMT SERIES



GUK SERIES



ZM SERIES



KMFE SERIES



N/AN SERIES



**A. NAIRSONS INDUSTRIES (INDIA)**

Phone : +91-161-2844570 sales@ktkingtiger.com www.ktkingtiger.com

# The ZEN Group Renames *its* European Branches



## A SYMBOL OF UNITY OF ITS GLOBAL TEAMS AS A WHOLE

It has taken many years of substantial work and considerable investments in state-of-the-art technology since the ZEN group was established in Dusseldorf, Germany, in 1992.

At this present time, with an extensive catalogue with more than 6,000 product lines, 3 factories, 6 warehouses around the world, and a presence in more than 18 countries. The company has decided to take a step forward in its consolidation as a global bearing manufacturer, presenting itself to its customers as a single entity.

It is for this reason that, from October, the names of its European branches are going to be changed as follows:

**EISENBERG**  
ZEN BEARINGS FOR YOUR FUTURE



**ZEN** WÄZLAGER  
GMBH

**PBI INTERNATIONAL**  
ZEN BEARINGS FOR YOUR FUTURE



**ZEN** BEARINGS  
UK LIMITED

**RODAPLUS SL**  
ZEN BEARINGS FOR YOUR FUTURE



**ZEN** RODAMIENTOS  
SL

**RODAPLUS SARL**  
ZEN BEARINGS FOR YOUR FUTURE



**ZEN** ROULEMENTS  
FRANCE SARL



## ABOUT THE ZEN GROUP

### German know-how, global reach.

ZEN Group is a bearings manufacturer according to **German DIN quality standards** for a wide range of industrial applications. The group's three production plants in China distribute their products **globally** through their **robust distribution network**.

### Quality is what defines ZEN Bearings.

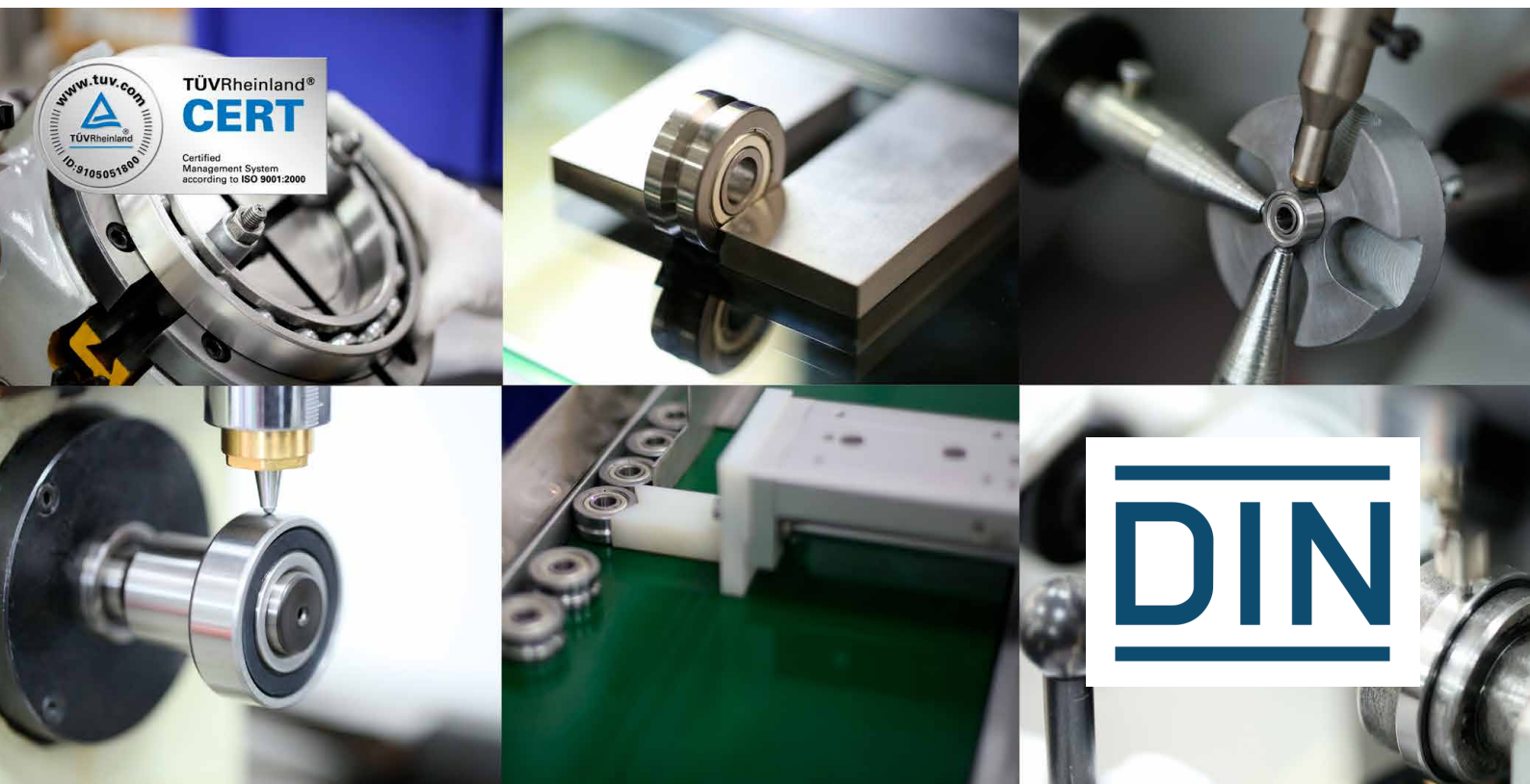
It is a mindset for all members of their team, and it is integrated through each step of their manufacturing process, from the sourcing of their raw materials right through to the aftercare once the product has been delivered to you.

### ZEN QUALITY CONTROL PROCESS

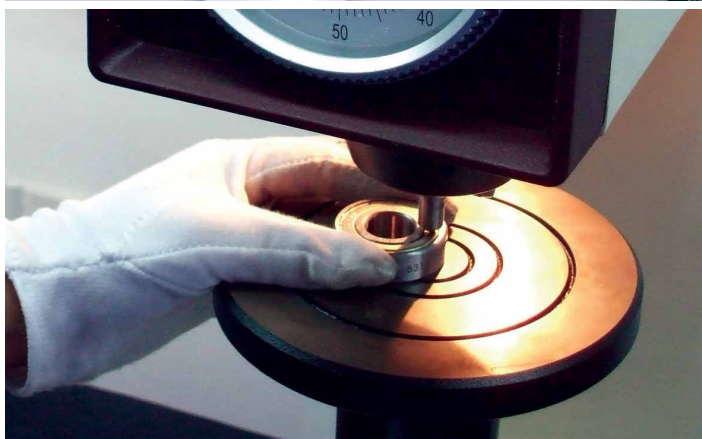
ZEN Group's **ISO 9001 certified** quality control centre is a crucial part of delivering high-quality bearings. Only this facility

covers more than **5,000 square meters**. It features **state-of-the-art** testing equipment and a great team of **highly qualified inspectors** working every day to ensure **a high level of quality**.

ZEN's Bearings quality control process involves numerous procedures during and after the production of the bearing. All of them, as well as their tolerances, are set to DIN Standards, certified by the German TÜV.



**DIN**



- **Material inspection:** A gas chromatograph allows testing of all types of steel for quality and composition accurately, before and after production.

- **Visual inspection:** Time-consuming and often undervalued, but an expert eye often helps to detect material or assembly faults, that mechanical test equipment cannot find.

- **Dimension Testing:** A rigorous tolerance check is performed on all bearing dimensions to guarantee that the products are according to the DIN standards.

- **Noise Testing:** Highly sensitive microphones measure and identify audible peaks of a rotating bearing. These peaks can indicate faults to the raceways or possible grease pollution.

- **Vibration Testing:** Using high, medium and low range frequencies, the vibration test can identify a range of bearing defects, such as imbalance, play and misalignment.

- **Radial and Axial Clearance Testing:** Our machines are calibrated regularly to ensure the tolerances adhere to DIN standards certificated by the German TUV.

- **Hardness Testing:** The Rockwell test determines the hardness of the material by measuring the depth of penetration of an indenter under load after hardening.

- **The salt spray test:** is a standardized test method used to check the corrosion resistance of materials. It is an accelerated corrosion test that produces a corrosive attack on the tested samples to predict their corrosion resistance. The appearance of corrosion products (oxides) is evaluated after a period of time. Test duration depends on the corrosion resistance of the material. The more corrosion-resistant the material is, the longer the period in testing without showing signs of corrosion. The standard testing period for ball bearings is 120 hours.

In addition to the DIN standards and the ISO 9001:2015 protocols, they implement their own checking procedures in their Chinese premises and global warehouses. This way, they ensure that the bearings are in perfect condition throughout the production and distribution.

*For more information about the ZEN Group, visit [www.zen.biz](http://www.zen.biz).*



## Introduction

JTEKT Bearings (formerly Koyo Bearings) continues its relentless efforts to optimize its products for very specific applications inside demanding industries and for professional leisure markets. Recently a new ceramic bearing for race bicycles was developed.



## The challenge

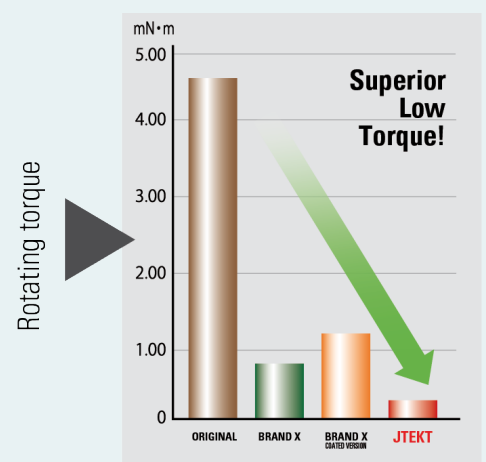
Customers continuously ask us to provide even better bearings for the wheels of race bicycles with reduced rotation friction but without compromising the strength and durability. With a long history of developing ceramic bearings for various demanding applications, JTEKT used its long experience in this field and managed to develop a unique bearing to meet exactly those demands.



## The Results

### 1. Spectacular reduction of rotating torque.

With the newly developed ceramic bearing for race bicycle wheel application, which we branded the “ONI bearing”, we could strongly reduce the rolling resistance compared to our previous design and another reputable reference brand (standard version and coated version) as can be seen in Figure 1.



— Figure 1

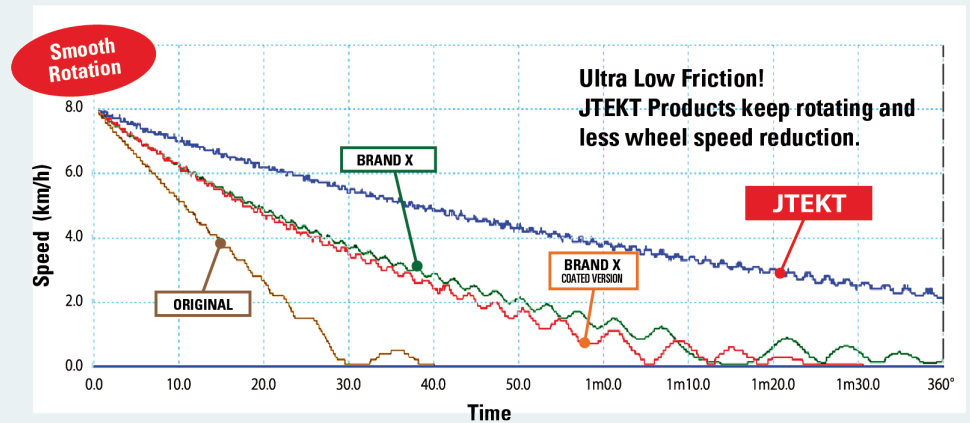
## 2. A strong reduction in wheel speed deceleration.

The best evidence of the superior performance could be demonstrated on a wheel speed deceleration test bench that we developed, providing the results as can be seen in figure 2.

Please check the superior performance of our products here



Test results prove: JTEKT **Superior Performance** of Ceramic Bearing

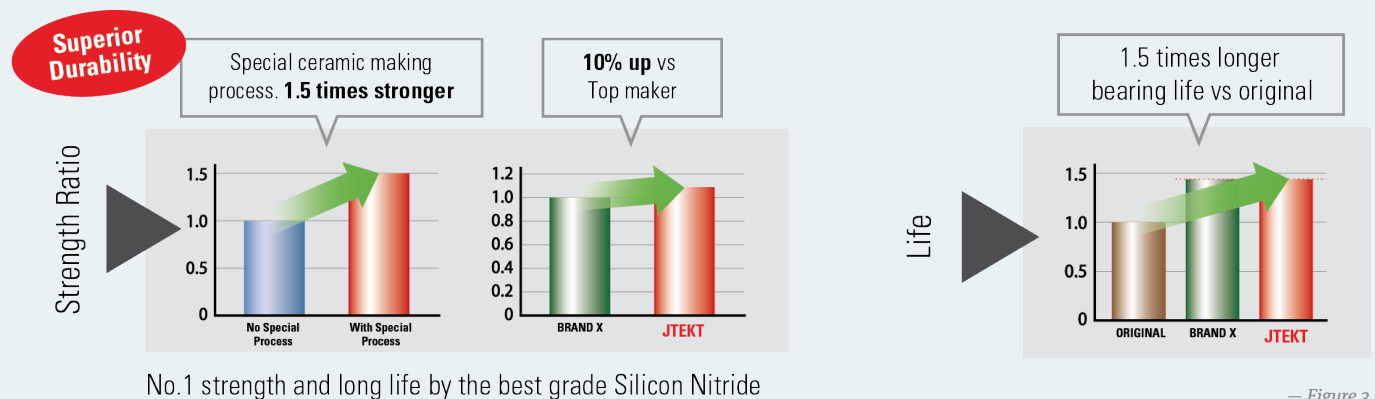


— Figure 2

The actual bench test can be seen “live” on a Youtube video, that can be reached via the QR-code link.

## 3. Increased strength ratio and increased bearing life

As a pleasant side effect of this new developed bearing, also both the strength and the bearing life of the ONI bearing was improved, as can be seen in figure 3.



— Figure 3

## The ultimate achievement

Our ceramic ONI bearing helped the world champion to win the golden medal at the Tokyo Omnium cycle track race.

## General notification

**Koyo Bearings** has been officially rebranded to **JTEKT Bearings** as of April 1, 2022. Please appreciate that this is only a change of brand. The company, its general structure, the products and services will remain the same. Our customers can rely on the continued good service and quality of our products in the future and our commitment to keep the same excellent business relationship with our valued partners, as in the past.

Please do not hesitate to contact us or your distributor in case you would like to have more information about our company, products and services.

Get to know our bearings at [www.koyo.eu](http://www.koyo.eu)





The **QUALITY** alternative  
to all leading worldwide  
manufacturers of  
mounted bearings.



***Grip Tight Ball \*Type E Tapered Roller\* S2000 Spherical Roller\*  
ISN Spherical Roller \* Solid Lube High Temp\* Sleeve Pillow Block\*  
E-Z Kleen & Ultra Kleen Food Grade\****

***POWER TRANSMISSION PRODUCTS;  
Couplings\*Drives\* Torque Arm\* Tigear \* Quantis Gear\****

- Largest stockholding of Dodge product outside of USA.
- Price support on high volume/ value orders & OEM enquiries.
- Setscrew, EC, DEC, D-LOK, Grip Tight fixings.
- Weekly airfreight shipments from USA.
- Metric & Imperial shaft sizes from stock.
- Online product catalogue.  
[www.racetranmissions.co.uk](http://www.racetranmissions.co.uk)

***EQUIVALENTS OFFERED TO  
LINKBELT, SEALMASTER, TIMKIN, SKF, MOLINE, FAFNIR, REXNORD, BROWNING, RHP***

***ONE BRAND • ONE SOURCE • ONE PARTNER***

**RACE** →  
**TRANSMISSIONS**

**T.** +44 (0) 1384 262615  
**E.** [sales@racetransmissions.co.uk](mailto:sales@racetransmissions.co.uk)  
**W.** [www.racetranmissions.co.uk](http://www.racetranmissions.co.uk)



# Preventing damage and reducing costs with sensor bearings



Maintenance and downtime costs are an important cost factor in production. This is evident above all due to the increase in investments in predictive maintenance and condition monitoring systems. However, these systems still have various weaknesses such as the difficult integration and implementation of sensors in already assembled machines. *Current existing approaches are either data-driven or rely on sensor data like vibrations, which can only be indirectly traced back to the actually relevant information - i.e. the machine condition and the remaining useful life.*

The HCP Sense sensor bearing measures the rolling bearing loads, monitors the lubrication condition and diagnoses bearing damage, thus providing direct access to the relevant information from the machine. This sensor bearing can be integrated into existing machines without great effort and major changes to the design. With the knowledge of bearing loads, the service life calculations for the rolling bearing and surrounding components can be updated, and the estimation of the remaining useful life makes it easier to plan future maintenance demands. Also, the status of the lubrication is critical for rolling bearings, because damage can occur after a short time if there is a lack of lubrication. With timely warnings, operating states can be adjusted and damage can be prevented, or at least the critical state is known and can therefore be planned. Especially in the case of lubrication, countermeasures are often very simple, because the problematic operating condition can be overcome quickly by relubrication or switching

to another lubricant. The signal also provides information about the condition of the rolling bearings. Being able to plan maintenance better and being able to prevent damage caused by lubrication offers enormous potential for reducing costs.

The technology is based on measuring the electrical properties of the rolling bearings. In the bearing, a hydrodynamic lubricating film separates each individual rolling contact. Here, the metallic surfaces of the rolling element and raceway face each other and are separated by a dielectric lubricant. Thus, each rolling contact forms a capacitor that depends on the deformation of the surfaces and the thickness of the lubricating film. This allows statements to be made about the bearing load and the lubrication. In addition, damages that affect the surface structure can also be identified from the signal.

There are no directly comparable technologies that combine all the functions of the HCP Sense sensor bearing. For example, traditional force sensors can be used to measure the bearing loads. Due to their standardized interfaces, implementation in designs is often complex and expensive. Other systems for monitoring the bearing loads work with significantly more complex technologies that prevent widespread implementation. There are various systems for monitoring the lubricant that determine chemical or physical parameters of the lubricant in the laboratory or by inline measurement. However, the actual goal of lubrication monitoring is not to provide characteristic values of the

lubricant, but to monitor the function of the lubricant, i.e. the separation of the contact partners. This is where the advantage of the HCP Sense sensor bearing lies. The lubricant is monitored in contact instead of measuring parameters that are not recorded in situ. For Monitoring the condition of bearings, the established technology is vibration measurement. In the case of slowly rotating roller bearings, however, the measurement is often not possible and in applications with strong superimposed vibrations from other machines and processes, the measurement of the vibration often does not provide a clear result. The HCP Sense sensor bearing offers a simple and economical way of monitoring forces, the lubricant and the bearing condition.

The use of the sensor bearing from HCP Sense is particularly worthwhile whenever the early detection of roller bearing problems prevents high costs. These applications can be divided in two classes, process monitoring and condition monitoring. If the quality of processes is monitored, e.g. minimum or maximum forces, the process quality can be continuously monitored. When it comes to condition monitoring, the focus is on machines and systems whose downtime leads to immense costs, such as in the chemical industry or the pulp and paper industry. If damage can be detected early or even prevented by monitoring the lubrication, maintenance can be planned more cost-effectively, thus expensive unplanned downtimes can be prevented.

Visit [www.hcp-sense.com](http://www.hcp-sense.com) for more information about the HCP Sense technology.

# Manual or Automatic Lubrication?

## How to Decide

Lubrication is an essential part of machinery maintenance for nearly every production facility. On average, lubricant purchases only amount to 3 percent of a maintenance budget, but lubrication-related activities can influence an estimated 40 percent of total maintenance costs.



In order to achieve optimum reliability and maximum benefits from a lubrication program, several factors need to be taken into account. These factors are summarized by the five R's of lubrication:

- Right lubricant

- Right quantity
- Right time
- Right point
- Right method

The starting point of an effective lubrication program is the detailed mapping of all

lubrication points, including their working conditions, lubrication requirements, and criticality. This information is needed to select the most suitable lubricant and the quantity of lubricant needed, as well as to calculate the adequate relubrication intervals. These are the first three R's.

The fourth “R” refers to best practices, such as tagging and color-coding (or other methodology) of both lubrication points and tools in order to avoid cross-contamination.

### Maintenance Costs Influenced by Lubrication-Related Activities



Besides lubricant costs, half of the acquired components will require relubrication. Overtime, labour is mostly a result of machine failures typically caused by inadequate lubrication. In addition, approximately 5 percent of labour costs can be attributed to lubrication activities.

The fifth “R” can be defined once the application conditions, asset criticality, and maintenance strategy are analysed. This will help you decide whether to automate each lubrication point. To make that decision, the pros and cons of automatic lubrication should also be understood and considered.

Once the five R’s are defined, you can determine the best way to lubricate a component with the resources available.

### Criticality Analysis

A thorough criticality analysis of each asset will illustrate the impact of a failure in terms of:

- Overall production cost

- Overall maintenance cost
  - Environmental impact
  - Health and safety of personnel
- The most critical assets are commonly the first targets of automatic lubrication.

### Maintenance Strategy

The maturity level of a maintenance program (corrective, preventive, predictive, etc.) will dictate the skill and knowledge level required of personnel involved in lubrication-related activities.

As the maturity of maintenance and associated lubrication programs increases, so does the complexity of tasks that lubrication technicians must be capable of completing. These include activities such as:

- Lubricant analysis
- Continuous adjustment of lubrication routes
- Contamination control and fluid reconditioning
- Inspection routes

Therefore, as more mature maintenance programs are adopted, the areas where skilled maintenance technicians can add value to your operations need to be carefully considered. For example, are they best utilized performing manual relubrication, which can easily be automated, or by using their skills and knowledge to perform more analytical tasks, lubricant analyses, and making improvements to the lubrication program?

### Benefits of Automated Lubrication

There are many advantages to using automatic lubrication systems. These include reduced waste and risk of bearing failure, cleanliness, less labour, and improved environmental health and safety. The benefits of this system can be seen across multiple industries. For example, an automatic lubricating system would be ideal for pharmaceutical industries

where they have to deal with multiple types of equipment, harsh environments, and hundreds of lubrication points. By having this system, they ensure their machines are working at peak performance to produce a quality product every time.

### Reduced Waste and Risk of Bearing Failure



Relubrication quantities are dictated by the physical space available in the bearing, while relubrication intervals are dictated by the working conditions that determine the degradation rate of the lubricant. This includes factors such as speed, load, temperature, and the type of bearing.

A single-point automatic lubrication system can deliver the right amount of grease at the right time to each lubrication point. This reduces both grease waste and the risk of bearing failure. Especially when such system is coupled with ultrasonic sensors and a remote monitoring system, lubricating based on bearings’ condition, assuring perfect lubrication at the right time, always. One good example is the OnTrak & Smartlube from UE Systems.

Consider, for example, a bearing that needs to be relubricated with 2 grams of grease every week. With a standard grease gun, this would mean that the bearing should receive about 1.3 “strokes.” However, manually delivering 0.3 strokes is difficult, and it would likely result in a full two strokes being delivered. In other words, the bearing would receive 3 grams instead of 2 grams each time. If we assume the technician is satisfied





with two strokes because he doesn't see any grease coming from the seals, after a year, the bearing will receive 156 grams (52 weeks times 3 grams per week) instead of 104 grams (52 weeks times 2 grams per week). This means that up to 52 grams (50 percent) of the grease will be wasted.

#### **Cleanliness**

An automatic lubricator can supply a continuous and accurate flow of fresh and clean lubricant.

Lubricant contamination will also affect bearing life and increase the risk of failure. In manual lubrication programs, avoiding

grease contamination can be a challenge.

Processes must be clean to ensure no external contamination ingress into the grease, and each lubrication point should have a cap on its grease fitting. In addition, the utmost clean relubrication process for each point must be followed every time.

In the previous example, the technician will relubricate the given point 52 times a year. As a result, the bearing will be exposed 52 times to external contamination as well as to over- and under-lubrication.

By comparison, a properly installed single-point automatic lubricator can supply a

continuous and accurate flow of fresh and clean lubricant, keeping the application in proper condition while at the same time preventing contaminant ingress.

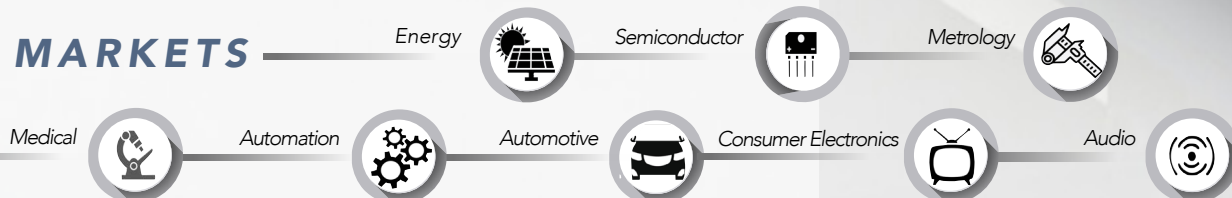
#### **When to Use Automatic Lubrication**

Automatic lubrication alone certainly is not the solution to all your lubrication issues. It must be properly understood to boost its potential benefits. However, there are solutions available in the market for virtually every application, so it is difficult to imagine that a critical application is not worth equipping with an automatic lubrication device.

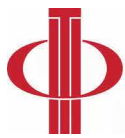
# OAV DISRUPTIVE TECHNOLOGY SIGNIFICANTLY ALTERS THE WAY THE INDUSTRIES OPERATE



## MARKETS



[www.oavco.com](http://www.oavco.com)  
Princeton, USA



中信泰富特钢集团股份有限公司  
CITIC PACIFIC SPECIAL STEEL GROUP CO., LTD

HQ located in Jiangyin, about 2 hours driving from Shanghai.  
Total capacity 15 million tons and peak year 2 million tons of bearing steel sales. The strategic supplier and partner for all the leading bearing makers. The bearing steel products are widely used in Automotive, wind-power energy, high-speed railway and other premium industrial applications.

# World's Most Competitive Special Steel Group



Jiangyin Xing Cheng Special Steel Works Co., Ltd. • Daye Special Steel Co., Ltd. • Qingdao Special Iron and Steel Co., Ltd.



[www.citicsteel.com](http://www.citicsteel.com)  
<https://citicsteel01.en.alibaba.com>



[tracy.wang@citicsteel.com](mailto:tracy.wang@citicsteel.com)



+86 510 80675575



# From the “cradle” of Chinese Iron & Steel Industry to A Diversified Solution Provider for High Quality Bearing Steel

By SUN Zhicheng, HU Tian, CHEN Jun (DAYE SPECIAL STEEL)

Daye Special Steel Co., Ltd., located in Huangshi, Hubei China, is a subsidiary of CITIC PACIFIC SPECIAL STEEL GROUP. The company history can trace back to 1890 and is honored as the “cradle” of Chinese iron & steel smelting technology. Today it plays an important role in the world bearing industry, as well as in the CITIC Group’s strategic blueprint of industrial chain along China Yangtze River and the Coast.

As one of the largest special steel manufacturers, DAYE possesses well-equipped facilities, fine technologies, and provides excellent service that focuses on customers cares. With the deep understanding that the global manufacturing industry is currently undergoing profound changes requiring more vigorous development of sustainable manufacturing, DAYE has accelerated reforms and innovations in high-quality development of the bearing steel productions in terms of quality, efficiency, and diversity.

## Process and Improvement Measures

As we know, fine bearing steels must enable bearings to have long fatigue life and other good qualities like high precision, high speed, high hardness, low noise, corrosion resistance, etc. In order to continuously improve such performances to meet diversified customer requirements, DAYE has taken a series of measures, such as by lowering oxygen content, homogenizing chemical compositions, controlling non-metallic inclusion and its types, controlling the carbide distributions and the particle size, to name a few. Besides, with the adoption of precision controlled-rolling and precision controlled-cooling process, the bearing steel produced now has more homogeneous spheroidizing microstructures and smaller decarburized layer, which helps to enhance the stability.

In smelting, DAYE has optimized two major routes as follows:

1. EAF → LF+RH/VD → ingot casting → reheating → (blooming) → rolling;
2. BOF/EAF → LF+RH/VD → con-casting → electroslag remelting (ESR) → reheating → (blooming) → rolling.

DAYE's ESR technology has reached world level: our premium railway bearing steels originated from this technology have accounted for 60% market share in China.

## Quality and Achievement

In recent years, Daye has been focusing on the research and development of new type of bearing steels by overcoming technical barriers for the industry, such as high temperature steel and high hardenability steel, etc. In addition to the approvals from many premium industrial customers on standard applications like wind power, railway and aerospace, we can also offer tailor-made service to customers and have established long-term strategic relationship with many high-end customers worldwide.

Today, DAYE has developed many key technologies with own intellectual property rights, such as protective casting technology, blanketing with inactive gas in ESR technology, piecewise controlled-rolling and controlled-cooling technology, etc. It is worth mentioning that we have



developed successfully the steels for high-power (over 5MW) wind turbine bearing rings and rolling elements. In addition, we can also produce steels for other clean energies including hydrogen related. We are committed to supporting the development of clean energy industry and playing a crucial in providing the solution of realizing "Caron Neutral".

Over years of hard working on quality improvement, our products have been validated by 174 certifications, such as ISO9001, AS9100D, ISO50001, IATF16949, ISO45001, ISO14001, etc. Furthermore, Daye has been awarded many prizes and honors, for instance, the project we lead and so called "Development and Application of Key Technologies for Green and Efficient Electroslag Remelting of High-quality Special Steel" won the First Prize of "National Award for Science and Technology Progress". And many of our bearing steel products won Gold Prize of "National Quality Award". What's worth mentioning, we are proud of being the sole manufacturer in China that is approved to produce transmission bearing steel for high-power (over 3.6MW) wind turbine, as well as for passenger train, railway wagon and locomotive.

## Vision

Thanks to the strong leadership and coordination from parent company, CITIC PACIFIC SPECIAL STEEL GROUP, we are enjoying great synergies and support from the group level. Together with our sister companies Jiangyin Xing Cheng Special Steel Works Co., Ltd. & Qingdao Special Iron and Steel Co., Ltd., we are able to provide the most diversified portfolio of bearing steel products and high-quality special steels for other industries as well. More importantly, we'll take this advantage to pursue sustainability and excellence, and eventually become one of the most competitive special steel enterprises inside of our group and in the world.

## Authors:

**SUN Zhicheng**, Metallurgical Engineer at Technology Research Institute, DAYE SPECIAL STEEL.

**Hu Tian**, PHD Student at Center for Studies of Education and Psychology of Ethnic Minorities in Southwest China, Southwest University.

**CHEN Jun**, Director of Technology Research Institute, Senior Metallurgical Engineer, DAYE SPECIAL STEEL

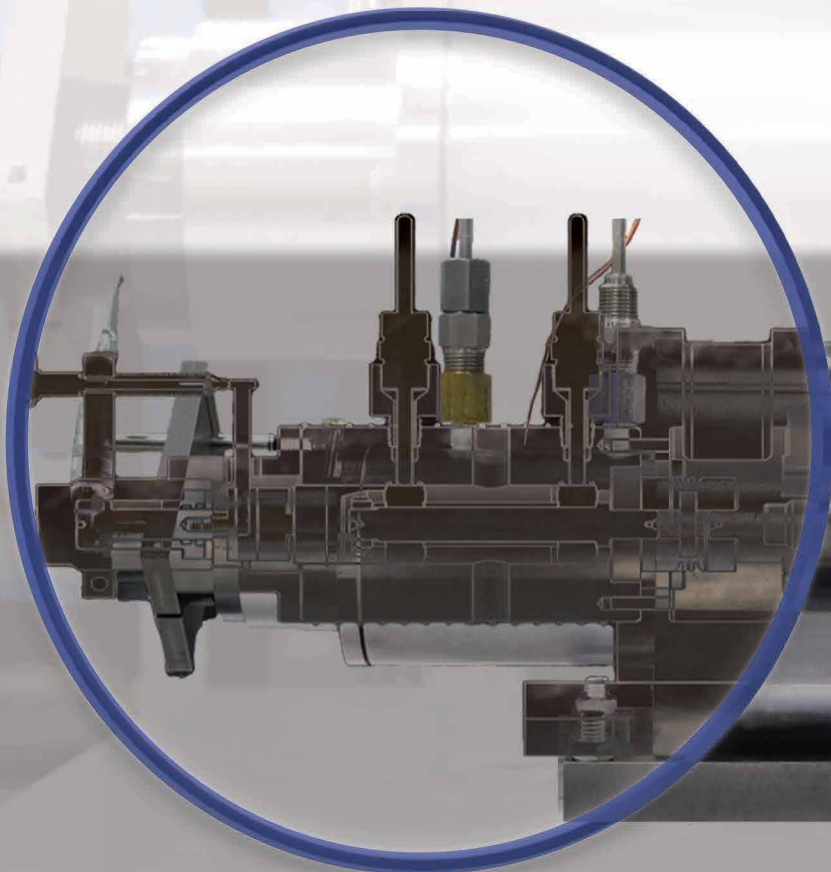
# *HIGH-SPEED BEARING TESTING*



Bearing Testing in support of Electric Vehicles;  
go further, go faster with NES High-Speed Testers!

- ✓ POWER LOSS
- ✓ ACCELERATED WEAR
- ✓ FATIGUE LIFE
- ✓ SURFACE TREATMENTS
- ✓ CAGE DESIGN
- ✓ LUBRICANT EFFICIENCY

*North America's Largest Independent  
Bearing Testing & Inspection Facility*



*Celebrating 25 years of excellence  
1997 -2022*

**NAPOLÉON ENGINEERING SERVICES**  
**NES BEARING Co., INC**  
SALES@NESBEARINGS.COM  
(877) 870-3200





## **The Superior Quality Bearing Manufacturer of China is Looking for New Distributors Worldwide**

China's well-known and largest bearing manufacturing company ZWZ Group is expanding its global distributors network by announcing new distributors cooperation plan. The company is currently present in more than 100 countries and aims to increase this number in the coming period by appointing new distributors.



**Steel | Cement | Mining | Engineering Machinery | Wind Mill | Railway**

**Contact [export@zwz-bearing.com](mailto:export@zwz-bearing.com) to become a ZWZ distributor**

**[www.zwz-bearing.com](http://www.zwz-bearing.com)**

# Higher wear resistance and longer tool life in hard turning applications up to 58 HRC with Kennametal's KYHK15B™ grade

*New ceramic grade delivers highest productivity when machining hardened steels, high-temperature alloys, and cast irons.*

Kennametal has introduced its latest ceramic turning grade, KYHK15B™, designed to deliver increased productivity and lower cost per edge in hard turning operations. The new grade provides greater depth of cut capabilities than PcBN inserts when machining hardened steel, hightemperature alloys, and cast iron, as well as maximum tool life and wear resistance for the most demanding turning applications.

“KYHK15B provides excellent edge stability, high chipping resistance, and a PVD gold coating makes wear progression identification very easy. From smooth and varying depths of cut to heavy depths of cut, KYHK15B can be an economic alternative to PcBN inserts,” says Robert Keilmann, Product Manager, Kennametal.

KYHK15B builds on an existing line of high-performance ceramic turning grades, providing manufacturers a productive solution for hard turning applications even in varying or heavy depths of cut.

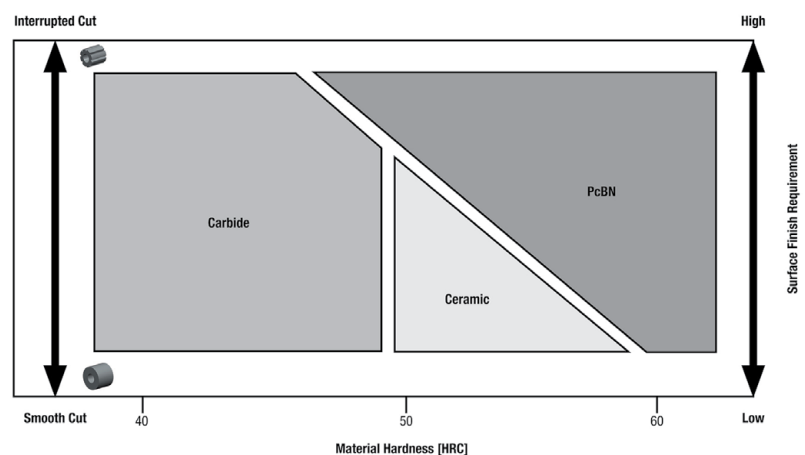
[Click here for more information: KYHK15B](#)

## About Kennametal

With over 80 years as an industrial technology leader, Kennametal Inc. delivers productivity to customers through materials science, tooling and wear-resistant solutions. Customers across aerospace, earthworks, energy, general engineering and transportation turn to Kennametal



— A broad range of styles, sizes, and edge preparations are available. These include the most popular styles of double-sided roughing and finishing inserts for predictable, cost-effective machining.



— Depending on the surface requirement and the type of cut, the ceramic grade KYHK15B can be an economic alternative to PcBN inserts when machining hard materials >48 HRC.

to help them manufacture with precision and efficiency. Every day approximately 8,600 employees are helping customers in more than 60 countries stay competitive.

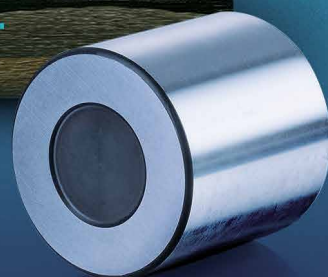
Kennametal generated approximately \$1.8 billion in revenues in fiscal 2021.

[Learn more at www.kennametal.com](http://www.kennametal.com)

「 」 is creating  
value for next  
generations.

「 」 is here to  
support susta-  
-inable operations.

# THE「ANSWER」 IS BLOWIN' IN THE WIND



## BEAUTY IS IN THE ROTATION

WEB: [WWW.XCC-ZXZ.COM](http://WWW.XCC-ZXZ.COM) | EMAIL: [XCC@XCC-ZXZ.COM](mailto:XCC@XCC-ZXZ.COM)



# TIMKEN

## Providing Bearings for GE's Haliade-X, The World's Most Powerful Offshore Wind Turbine

Technically advanced bearings allow for increased turbine size  
and help maximize efficiency and durability

The Timken Company announced that it is designing and supplying main shaft bearings for **GE Renewable Energy's Haliade-X**, the world's most powerful offshore wind turbine. Each Haliade-X turbine will have a capacity of up to 14 MW and be able to generate up to 74 GWh of clean energy a year. Initial Haliade-X installations are scheduled to begin in 2023.

“

We are honored to play a significant part in taking wind energy to the next level with this milestone in turbine technology," said Andreas Roellgen, Timken vice president, Europe, Asia, Africa. "As turbine manufacturers like GE continue to push the limits on performance to expand renewable energy options, we're there to help them overcome challenges with our technical problem-solving expertise and long history of engineering innovation.

”



Timken first collaborated on a wind project with GE to supply the bearings used for Haliade 1, the 6 MW precursor to Haliade-X. When operational later this year, the Parc du Banc de Guérande, an offshore wind farm off the coast of France, will consist of 80 Haliade 1 turbines equipped with Timken bearings.

In 2021, Timken achieved double-digit revenue growth in the renewable energy market sector for the fourth consecutive year.

The company reached record sales in wind energy last year and is poised for continued success in the years to come. Over the last five years, Timken wind energy sales have grown at more than double the CAGR for the global wind energy market during the same period.<sup>i</sup> As global demand for equipment and services for the growing wind energy industry continues to increase, the company is prepared to capitalize further.

To support future growth, Timken has made targeted capital investments, including more than \$75 million through 2022 to increase renewable energy capabilities across its footprint. With 12 percent of total company sales in 2021, renewable energy represents Timken's single-largest end-market sector.

*Based on company and Wood Mackenzie data.*

 **MADE IN INDIA**



# Spherical Roller Bearing Solutions



**STEEL | MACHINERY | MINING**



**BEARING MANUFACTURING INDIA**

✉ [sales@bmibearings.com](mailto:sales@bmibearings.com)

📞 +91 9987007699



India Office

☎ 91 88989 58004

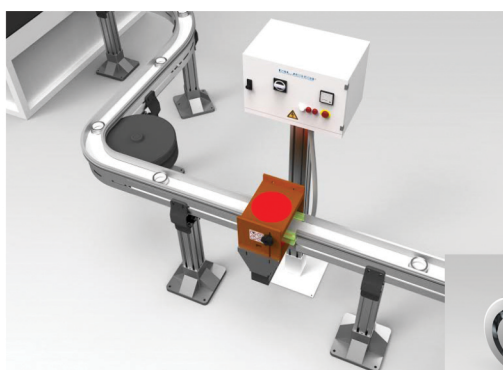


USA Office

☎ 1.832.220.0255

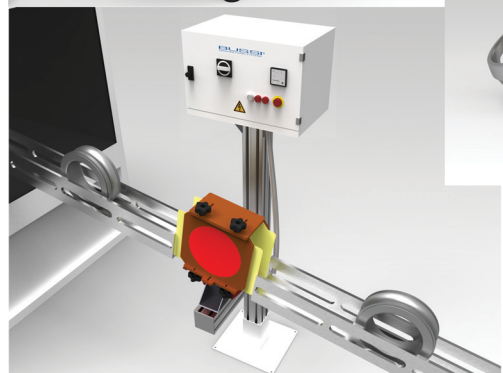
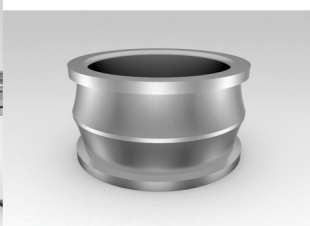
[www.bmibearings.com](http://www.bmibearings.com)

## EXTEND BEARING LIFE WITH BUSSI ELECTRONIC DEMAGNETIZERS



During the manufacturing process, the demagnetization, as magnetic pre-washing, is the optimal preparation for the bearing components cleanliness.

Bussi Demagnetizers prevent from friction, limited fluency, early wear and reduced life of the bearings.



### DISCOVER OUR SOLUTIONS DEDICATED TO THE BEARING INDUSTRY

#### DISCOVER BUSSI DEMAGNETIZERS KEY TECHNICAL ADVANTAGES:

- MINIMUM RESIDUAL MAGNETISM
- MINIMUM ENERGY CONSUMPTION
- HIGH DEMAGNETIZING VALUES  
REPEATABILITY
- EASY PARTS TRANSFER WITH NO  
MAGNETIC RETENTION
- EASY IN PROCESS INTEGRATION  
WITH I/O INTERFACE
- STANDARD A DEDICATED  
SOLUTION DESIGN
- HIGHLY DURABLE INVESTMENT

#### Bussi Demagnetizing Systems

Via Valpellice 13, 10060

San Secondo di Pinerolo (TO) - ITALY

T. +39 0121 500660 F. +39 0121 501397

[www.bussi-demagnetizers.com](http://www.bussi-demagnetizers.com)

[bussi@bussi.it](mailto:bussi@bussi.it)

# How to support Change Management in companies

In the current context, companies must be able to respond to pressures and opportunities from inside and outside. In particular, the changing and turbulent environment poses challenges for companies that require strategic renewals and organizational changes.

When introducing product, process, system or business model innovations, it is **necessary to accompany the people**, involve them and provide tools to support the desired change.

ICT designed an international training program in support of the **organizational change**, which embraces the individual and organizational dimension of change. The program aims to:

- ▶ Support people in their individual journey of change to allow the integration of new behaviors and the spread of the new culture;
- ▶ Develop the ability to manage the change at the company level, integrating it into the roles, structures, processes and leadership skills of the organization.

The **focus in the individual dimension** is the understanding of the dynamic of personal change, behaviors and

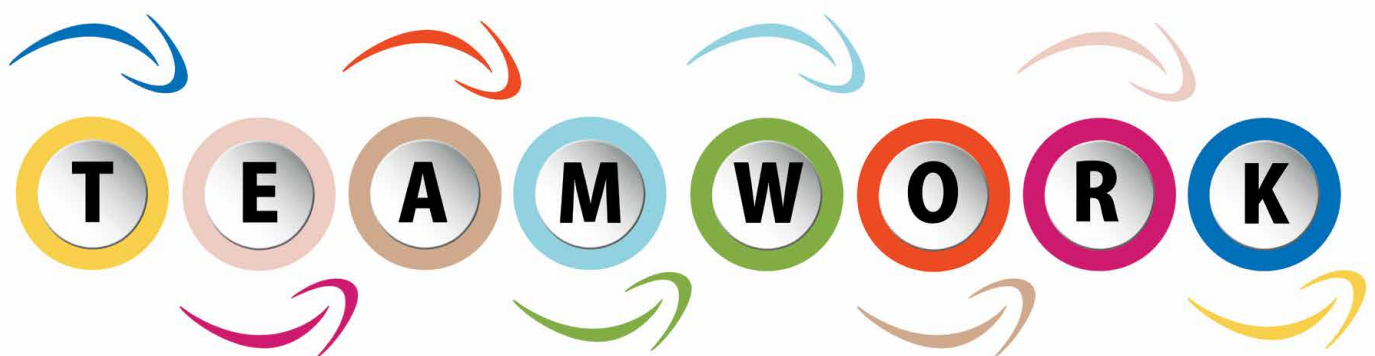


instinctive reactions to the personal and organizational changes as well as the acquisition of tools to facilitate the change.

The focus **in the organizational dimension** is the understanding of the organization challenges and of the logics for effective change management, by analyzing the impacts of organizational change on people, performance and work climate and by identifying the stages of the change process, as well as the organizational strategies to be used.

Product, process, system and business model innovations require above all a new mentality, a new set of tools and a new set of skills. Change is an inevitable process, but it is not a natural exercise. Organizational change processes must be **managed and guided**.

*ICT supports companies to personalize the training plan to their specific needs. For more information, please get in touch with ICT calling at +39 (0)121 376811 or writing to [info@consulting-trading.com](mailto:info@consulting-trading.com)*



# SCHAEFFLER Offers Sustainable Solutions for the Food and Packaging Industry



— Schaeffler new housing units made of white, glass fiber reinforced plastic, which provides high levels of resistance for sensitive food processing applications

Schaeffler demonstrated how further successes in sustainability can be achieved in the food and packaging industry at Hannover Messe 2022. The automotive and industrial supplier is not simply confining its efforts to new products in this area, however, with the company practicing and recommending a much more comprehensive approach to the development of solutions. Schaeffler also used practical examples and development projects to demonstrate the potential of sustainable engineering.

As Ralf Moseberg, Senior Vice President Industrial Automation at Schaeffler, emphasizes: “The foundation for the use of resources is laid as early as the design and development phases for production equipment, and must focus on comparing

the efficiency and operating points of the various drive systems, such as torque motors or geared motors, extending the relubrication intervals and service life of components, reducing friction, and optimizing seals.” Reducing the lubricant

requirement has multiple benefits for the operator and the environment, due to the additional savings on water, cleaning agents, and reprocessing costs that are always generated in parallel.

## Extended Food program for safe, clean, and sustainable food production

Specific environmental influences and legal requirements call for the use of adapted rolling bearing solutions. As part of its new Food program (series FD), Schaeffler is offering a range of corrosion-resistant and sealed standard deep groove bearings, which are supplied with an initial application of lubricants produced to food industry standards, in order to satisfy such conditions. In addition, Schaeffler has presented new housing units made of white, glass fiber reinforced plastic, which provides high levels of resistance for sensitive food processing applications. The lubricant compound Schaeffler Lubtect is recommended for particularly demanding operating conditions and lubricating requirements. Lubtect is a porous but dimensionally stable polymer, which ensures continuous and reliable lubrication.

The radial insert ball bearing and housing units are for use in sensitive application areas such as food processing. The units are ready-to-fit and comprise white plastic housings in which corrosion-resistant radial insert ball bearings are fitted. Open and closed end caps, and a back seal for flanged designs, complete the range. The selected materials ensure high media resistance to weak acids, cleaning agents, and seawater, and can be used in a wide range of applications. The allergen-free lubricating grease used in the bearings is approved to NSF category H1, fulfills the requirements of FDA21 CFR 178.3570, and is certified to halal and kosher standards. The plastic housings are available in three different designs. The inner ring is located on the shaft by means of a grub screw or eccentric locking collar.



— The radial insert ball bearing and housing units are ready-to-fit and comprise white plastic housings in which corrosion-resistant radial insert ball bearings are fitted



— Open and closed end caps, and a back seal for flanged designs, complete the range



— One option for providing more reliable lubricant retention in bearings is available in the form of lubricant compound Schaeffler Lubtect. Lubtect is available for deep groove ball bearings, tapered roller bearings, spherical roller bearings, cylindrical roller bearings, and needle roller bearings

In addition to specific environmental influences, statutory requirements in the food and beverage industry also call for the use of adapted bearing solutions. To accommodate these requirements, Schaeffler is offering a range of single row deep groove ball bearings, as part of its new Food program, with bearing rings, cages, and rolling elements made from corrosion-resistant steels. The lubricating grease used is non-toxic, allergen-free, neutral in taste and odor, and suitable for applications where contact between food and lubricant cannot always be ruled out (NSF-H1 classification). The bearings are sealed on both sides using contact-type, steel-reinforced elastomer lip seals made from NBR. Ball bearings used in the Food program are identified by the suffix FD.



— Schaeffler is offering a range of single row deep groove ball bearings specifically for food production applications, as part of its new Food program

## Conserving resources in the food and packaging industry



— Example of drives in practice: Although the purchase costs for direct drives are higher than those for geared motors, a higher overall efficiency and virtually maintenance-free operation translates into savings of around 60,000 euros per year in energy costs, and an approximate reduction of 130 metric tons in CO<sub>2</sub> emissions, for a single beverage bottling plant

IoT solutions such as the Schaeffler OPTIME condition monitoring system and the smart Schaeffler OPTIME C1 lubricator also help to avoid rejects and conserve resources accordingly. In addition to smoother production, operators who use the OPTIME system also benefit from no longer having to hold stock of spare parts and replacement units over many years. The energy and raw material savings associated with the now nonessential production of unnecessary spare parts will lead to improved energy footprints for production locations. In production plants, OPTIME C1 helps to prevent overgreasing and lubricant egress at the bearing positions, with resulting reductions also achieved here in the large quantities of water and chemicals that would otherwise be required for the necessary cleaning work.

[www.cmibearing.com](http://www.cmibearing.com)



**CMI BEARING CO., LTD**

E-mail: [sales@cmibearing.com](mailto:sales@cmibearing.com)  
NanYan High & New Industry Park  
Xinchang, Zhejiang, China



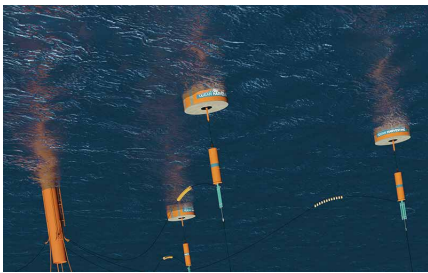
# Wave power – using **NSK** ball screws

*Ocean Harvesting is testing a new type of renewable energy generation*

Swedish start-up company Ocean Harvesting is harnessing a new inexhaustible source of energy. With a floating buoy it is possible to convert the up-and-down motion of the sea surface into electrical energy, where heavy-duty ball screws from NSK have an important role to play.



Even if the share of renewable energy generation is constantly increasing; in view of the ambitious goals for reducing CO<sub>2</sub> emissions, the world must develop new, sustainable sources of energy generation.



— Ocean Harvesting's WEC system can generate energy sustainably and CO<sub>2</sub>-neutrally from sea waves.  
Photos: Ocean Harvesting

Ocean Harvesting has developed a solution that extracts energy from the motion of sea waves. The basic idea of the system, called InfinityWEC (Wave Energy Converter), centres on buoys attached to the seabed. Ocean swells cause the buoys to rise and fall, with this movement captured by a hydraulic constant-force spring system (a hydraulic cylinder connected to a large gas volume) and two heavy-duty ball screws from NSK. The nuts of ball screws connect directly to the cylinder, thus converting up and down linear movement into a rotary motion (of the ball screw spindle) that acts directly on a generator to produce electrical power.

Many detailed solutions had to be developed before this elegant and sustainable concept could be put into practice. For instance, it is essential to guarantee the optimum alignment of the buoy motion for each individual wave, as this is vital for effective

energy generation. It is also necessary to guarantee the downward return movement of the ball screw nut, a task performed by the hydraulic cylinder. The cylinder stores part of the energy generated due to the buoyancy force and releases it to the ball screw when it moves down.

Choosing the drive system for these functions also required great diligence - especially as the drive constantly operates under adverse environmental conditions (sealed under water) with limited possibility of performing maintenance.

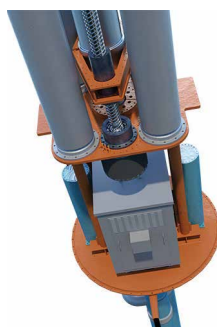
Mikael Sidenmark, CEO of Ocean Harvesting Technologies AB, explains: "Compared with winches and rack and pinion drives we evaluated, we found that ball screws are the best option to provide high force, long stroke, high efficiency and high rotary output to the generator."

The company's engineers opted for NSK because of the very long service life of the heavy-duty ball screws from NSK's HTF series. Mikael Sidenmark states: "The ball screws are expected to perform 100 million load cycles in 20 years - that's

very demanding." Another reason for collaborating with NSK, says Sidenmark, is the good level of support available. The development of HTF series heavy-duty ball screws was originally to serve heavy-duty machine tool applications, such as presses and other forming machines, as well as injection moulding machines with electric rather than hydraulic drives. Thanks to their ability to withstand very high loads while achieving exceptionally long service life, HTF series ball screws are also suitable for other infrastructure applications, like damping elements in innovative systems that help protect high-rise buildings from earthquakes.



— Originally developed for machine tools, HTF series heavy-duty ball screws also help to provide earthquake protection in buildings and bridges. Photo: NSK



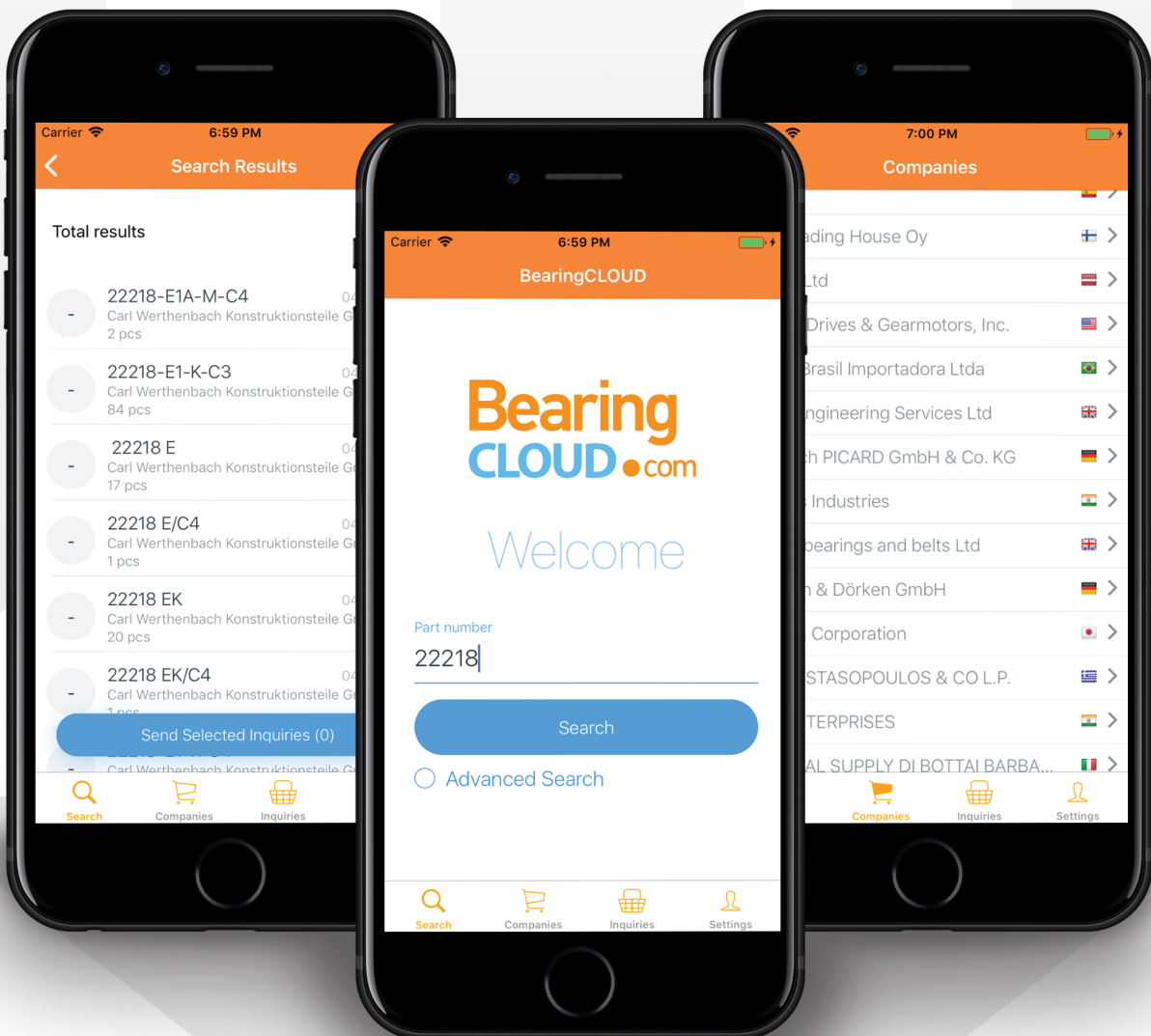
— Two NSK ball screws and a hydraulic constant-force spring system convert the up-and-down motion of the buoy into rotational movement that drives the generator. Photo: Ocean Harvesting

Ocean Harvesting is currently testing a prototype of the 'InfinityWEC' on a scale of 1:10. If satisfactory, testing of a 1:3 scale prototype will take place. In 2024 there will be a first full-size 'wave energy plant' to prove its viability. In the meantime, NSK will also be busy with development work, designing and manufacturing an HTF heavy-duty ball screw in the size required by Ocean Harvesting.

# Download the BearingCLOUD App!

- ✓ Search Stocks
- ✓ Send inquiries
- ✓ Check Companies
- ✓ Chat Function

[www.bearingcloud.com](http://www.bearingcloud.com)



Scan this code or visit  
[www.bearingcloud.com/apps](http://www.bearingcloud.com/apps)





— Friction bearing type pin-and-block universal joints, manufactured from alloy steel for high strength or stainless steel for better corrosion resistance, are designed for applications with moderate to high torque requirements for a wide variety of industries

# Friction bearing universal joints for packaging applications

- Over 3000 standard options to choose from
- Friction bearing universal joints have high torque capacity
- Single styles for compact installations and double styles for high misalignment
- Sold by Ruland and manufactured in the United States by Belden Universal for strict control of processes

Friction bearing universal joints are available from Ruland in a wide variety of sizes, styles and materials, giving packaging equipment designers the widest range of standard universal joints to choose from. Components are manufactured to tight tolerances for higher accuracy, torque capabilities and durability when compared to commodity-style universal joints.

Components are selectively heat-treated and ground for higher strength compared to competitor friction-bearing universal joints, giving them a precise and prolonged life. Single universal joints are best suited for space-constrained applications with angular misalignment up to 45 degrees. Double universal joints

are designed for applications with a wide distance between shafts or those in need of extreme angular misalignment accommodation up to 90 degrees.

Friction-bearing universal joints from Ruland can be equipped with nitrile boot covers for abrasion and oil resistance. Boots offer increased protection of the universal joints and can be packed with grease and sealed, giving the joints infinite life to reduce machine downtime. Boots also prevent harmful contaminants from getting into the joint that could otherwise compromise its function.

Friction bearing universal joints are precision manufactured from alloy steel for high torque ability or stainless steel

for better corrosion resistance. They are available in bore sizes ranging from 3/16 inch to 2 inches or 5 mm to 35 mm.

Ruland universal joints are available bored, bored with set screw, or bored with keyway and set screw. They are also available with no bore, allowing the user to custom-machine their own bore size or geometry. With over 3000 pre-machined options to choose from, Ruland has the largest off-the-shelf range of universal joints available in the market, giving users the ability to design with a standard part. Universal joints offered by Ruland are manufactured in the United States by Belden Universal and then bored and finished by Ruland for customer convenience.



# Software **Version 06/2022** is available

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 to 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 30 countries on 4 continents.

## General Extensions

Some start parameters were added to allow an easier integration with other systems. Using the COM-Interface now the parameter calculation can be called to generate additional results. The default for the Help system was set to an external viewer, which can also be started from network drives. Custom formulas can now be used within the parameter variation.

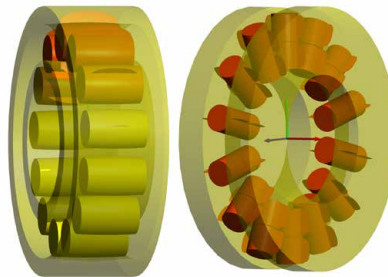
## Extensions in the Bearing Calculation

The bearing databases with catalog data from Schaeffler and SKF were updated. Schaeffler provides the number and dimensions of rolling elements and the database has to be provided in encrypted format with hidden internal geometry. For the SKF database the dimensions of the rolling elements are still approximated. The detail geometry like curvatures or profiles are still approximated in both cases.

Regarding the bearing databases including internal geometry, the databases from CSC and HQW/Barden are unchanged from last version. On request additional databases are available from some bearing manufacturers, for example from GMN or IBC.

As new bearing types toroidal roller bearings and double row thrust cylindrical roller bearings were added. In contrast to barrel roller bearings, toroidal roller bearings have no shoulders and allow larger axial displacements. The

radial clearance is dependent on axial displacements. The double row thrust cylindrical roller bearings have the same roller dimensions for both rows.



The track roller calculation with elastic outer ring is now also supported for double row deep groove ball bearings. Before a configuration of two single row bearings had to be used.

Interference fits affect the operating clearance of bearings. As there had been some customer requests now also multi-layer interference fits can be defined. For the inner and outer ring fit several layers using different materials can now be defined. Influence of centrifugal forces and temperature is considered. The stresses and displacements in the fits can be shown in a diagram.

In addition to stiffness matrices now also compliance matrices are provided in the report and in result tables.

**Define multi-layer interference fit**

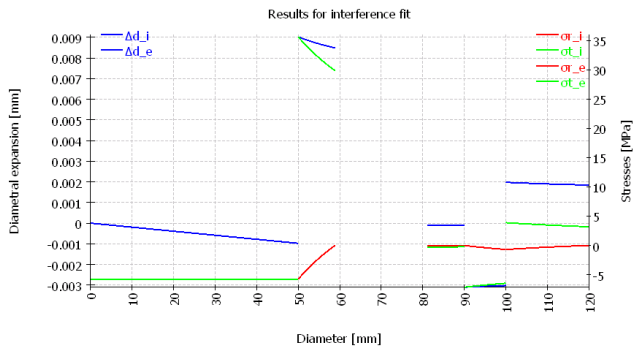
Inner ring fit, ordered from large to small diameter

	di [mm]	lwi [μm]	Material	E [MPa]	ν	ρ [kg/m³]
1	0	10	Steel	207000	0.3	7850

Outer ring fit, ordered from small to large diameter

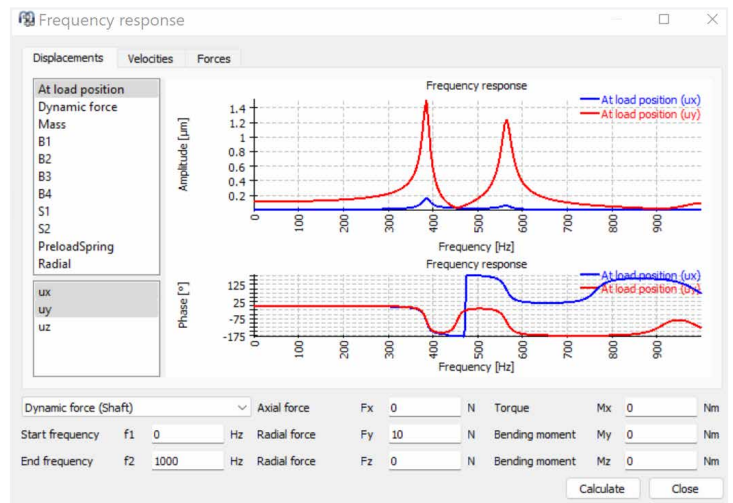
	De [mm]	lwe [μm]	Material	E [MPa]	ν	ρ [kg/m³]
1	100	-3	Steel	207000	0.3	7850
2	120	5	Steel	207000	0.3	7850

OK Cancel

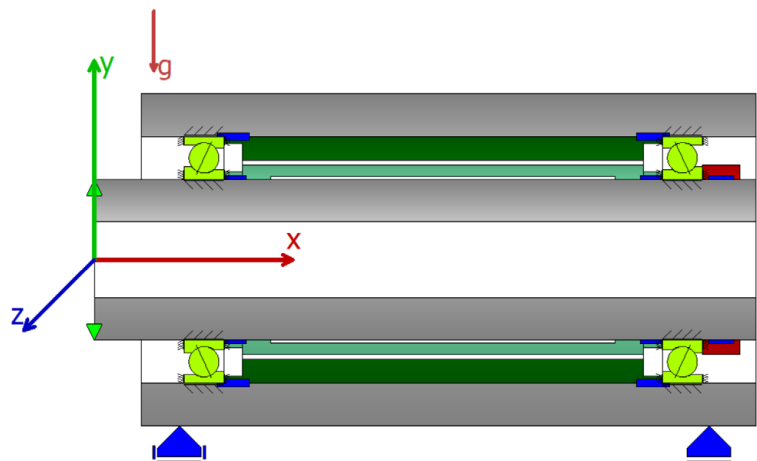


## Extensions in the Shaft Calculation

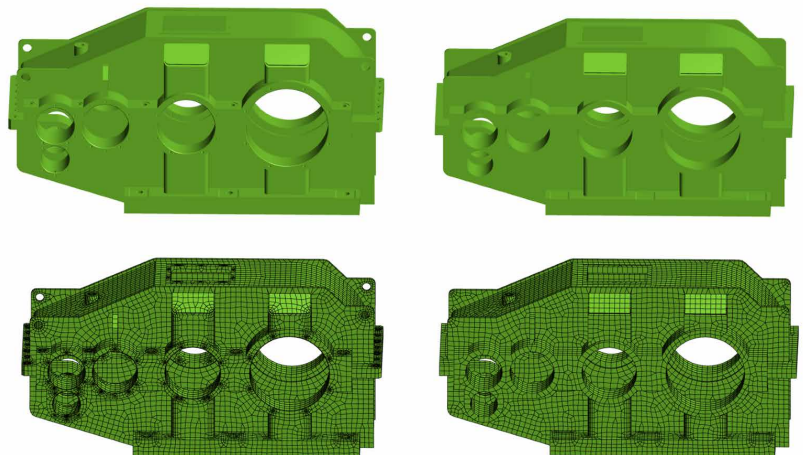
For the calculation of frequency response, a new dialog was added. It allows to calculate the response to periodic excitations in a frequency range and shows the resulting displacements, velocities or forces for several locations in one diagram. In addition to the amplitudes also the phase is shown.



An extended calculation model for bearings allows to specify three contacts for each bearing ring. The bearing ring can be connected to one part radially and to one part on each axial contact. Clearance between bearing ring and shaft or housing is considered automatically if the fitting is defined for the bearing. For example this allows to define a pretension with a nut directly (nut is shown in red and spacers in green). This leads to tension in the inner shaft and to pressure in the spacers.



For 3D-elastic parts a new import library is used for STEP import. This allows to do some defeaturing on import. By removing chamfers, radii and small bores, the number of elements can be reduced and therefore reduction time and memory usage.



For 3D-elastic shafts now also orthotropic material can be defined in cartesian coordinates in addition to cylindrical coordinates as before.

## Extensions in the Ball Screw Calculation

Several diagrams are added to the ball screw calculation which already had been available in the bearing calculation. So, diagrams for contact stress and sliding speed or wear parameters had been added.

A demo version is available for download at [https://www.mesys.ag/?page\\_id=1229](https://www.mesys.ag/?page_id=1229)  
For additional information, please check [www.mesys.ag](http://www.mesys.ag)



To ensure that **BearingNews** and **Motion+Drives** magazines are doing their part to protect the environment, the parent company, **iMotion Media**, has developed a strategy to offset the carbon footprint of its printed magazines. The twofold approach includes a fully supported tree planting campaign in conjunction with each newly released edition, and the use of recycled paper in the printing process.

Sustainability is no longer just a buzzword. Members of the global community have become increasingly aware of human impact on the environment. As a result, a massive movement is driving private sector companies to responsibly manage their environmental, economic, and social resources to safeguard the well-being of future generations.

The term 'sustainability' encompasses a large swath of efficiency objectives that aim to go beyond the thresholds of carbon neutrality. Companies must fulfill further economic and social obligations by devising less wasteful practices. When discussing the printing

of magazines, there is long-term value achieved by responsibly implementing environmentally friendly solutions associated with the use of paper. The paper industry has focused its efforts on the sustainability of raw materials, processes, and products. Highlighted within the industry's strategy is the promotion of sustainable forestry practices and responsibly harvesting renewable raw materials. Tree planting is considered one of the most effective ways to combat global warming, as forests naturally reduce atmospheric carbon dioxide (CO<sub>2</sub>) by removing it from the air through photosynthesis. In line with this strategy, iMotion Media has adopted 'tree planting for



reforestation' as the most effective method to reduce the carbon footprint associated with the printing and distribution of Bearing News and Motion+Drives magazines. In careful coordination with the release of each printed edition, a tree planting campaign will be launched to help restore forests and offset the use of natural wood materials used in paper production. In addition, iMotion Media is supporting the use of recycled paper in the printing process to reduce dependence on new materials. It will also continue to promote the currently available digital magazine options.

Thanks to the use of recycled paper and certified companies dedicated to carefully managing wood harvesting, there has been a decline in global

deforestation. And while there are positives to both recycled paper and the responsible production of new paper, recycled material contributes significantly more to global social and economic sustainability goals.

iMotion Media is happy to be a part of a forward-thinking movement with ambitions for a greener future. Through its broad reach within the Bearing, Power Transmission, and Motion Control Industries, iMotion Media intends to create an infectious optimism that will compound progress towards greater sustainability.





# THE #1 TRADE SHOW & CONFERENCE FOR FLUID POWER, POWER TRANSMISSION, AND MOTION CONTROL



## CO-LOCATED WITH CONEXPO-CON/AGG (two shows, one price)

The **International Fluid Power Exposition (IFPE)** is the place where engineers meet to:



**Spark new ideas** with in-depth technical conversations with other engineers.



**Discover solutions** current suppliers can offer to your unique challenges.



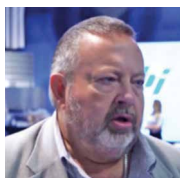
**Find new partners** among suppliers pushing the envelope on what fluid power can do.

## CONNECT WITH TOP MANUFACTURERS

Including **Bosch Rexroth, Danfoss Power Solutions, Parker Hannifin, Poclain, IFM Efector, Hawe Hydraulik, Husco**, and 375+ more!

**Join your peers** from these OEMs:

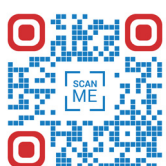
- Caterpillar Inc
- Komatsu
- Volvo Construction Equipment
- John Deere Construction
- Liebherr
- Doosan Bobcat
- CASE Construction Equipment
- KOBELCO Construction Machinery USA
- LBX Company



"There's no other show in the world I think that brings the OEM machine manufacturers and the suppliers as close together as this show. It's a good place to meet and learn about what's going on. In the Americas, in the Western Hemisphere, this is the show for fluid power."

**KEN ROSENBECKER** SALES MANAGER NORTH AMERICA | WIPRO INFRASTRUCTURE ENGINEERING

## IFPE ONLY HAPPENS ONCE EVERY THREE YEARS!



## SAVE 20% OFF REGISTRATION

Register now at **IFPE.com** and type **AD20** in the Promo Code box



## INTERNATIONAL FLUID POWER EXPO

MARCH 14-18, 2023  
LAS VEGAS, NV, USA

# ...GO GREEN!

## Green light for your business

A complete range production  
to satisfy all requirements

Long lasting  
top level performance

Reliable deliveries  
and after sales service

"Unlimited" stock thanks  
to global logistic network



### I N D U S T R I E S

FOR OVER 40 YEARS **THE GREEN BRAND** AT YOUR SERVICE

100% • QUALITY • RANGE • STOCK • SERVICE



AVAILABLE THROUGH AUTHORIZED ISB DISTRIBUTORS

isb-industries.com



# NACHI

NACHI EUROPE GmbH

**OUR SYNERGY  
YOUR PERFORMANCE**

## NACHI BEARINGS

Highest quality – Made in Japan

Outstanding performance and reliability extend  
NACHI bearing life. The comprehensive product  
range satisfies a wide scope of applications.



**MADE IN JAPAN**

[www.nachi.de](http://www.nachi.de)

BEARINGS | HYDRAULICS | ROBOTICS | TOOLS