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P918438 - 2021/01

Bearing NEWS

2021
MARCH
ISSUE 30

BEARING INDUSTRY MAGAZINE

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Publisher
BEARINGNEWS COMMV
Camille Huysmanslaan 27/15
2020 Antwerpen - BELGIUM

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

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2021's Online Bearing Expo & B2B Meetings event takes center stage

This new edition of Bearing News magazine highlights the launch of the online Bearing Expo & B2B Meetings event happening this month. The "live" virtual event on March 15-18th continues to gain momentum among bearing and power transmission professionals. In this issue, you can see which companies will be participating, browse the list of topics covered by the expert speakers, and explore all the unique virtual features designed to increase your company's digital presence worldwide. I hope to see you there!

As the world continues to endure the pandemic, technology driven solutions are propelling the industry to new heights. In the first of four exclusive interviews, you can read about how the digital arena is helping to drive the EPTDA forward under the direction, leadership, and vision of newly appointed President, Des Spillings. Further, if character is the virtue of hard times, no other story could capture the passion of innovation as much as our sincere discussion with Eiichi Kobayashi, Chief Executive Officer at COC Inc. Technology pioneering feats are on full display in our third interview with Shuailin Wang of DeepVision Technology, a revolutionary company actively driving the advancement of the AI automatic visual inspection in global industrial sectors. And finally, we caught up with Victoria Van Camp, CTO at SKF to hear how configuration technology in engineering offices is impacting the industry.

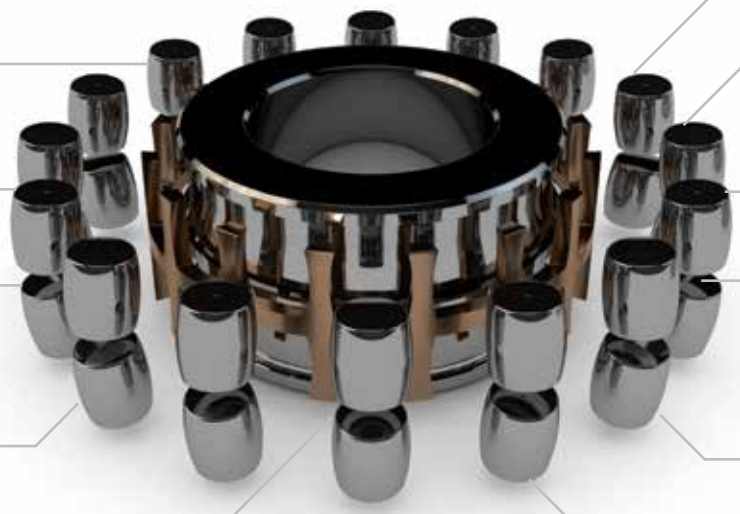
What's Rolling..

What's rolling in the bearing industry? A brief summary of what happened in the last six months in the bearing industry; more details about key companies and trends in the global bearing industry; new technologies for combating the manufacture of counterfeit bearings; a surge in online ordering is driving immense change in warehousing and logistics; case studies, performance reviews, new product offerings, and much more can be found in this issue of the Bearing News 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**



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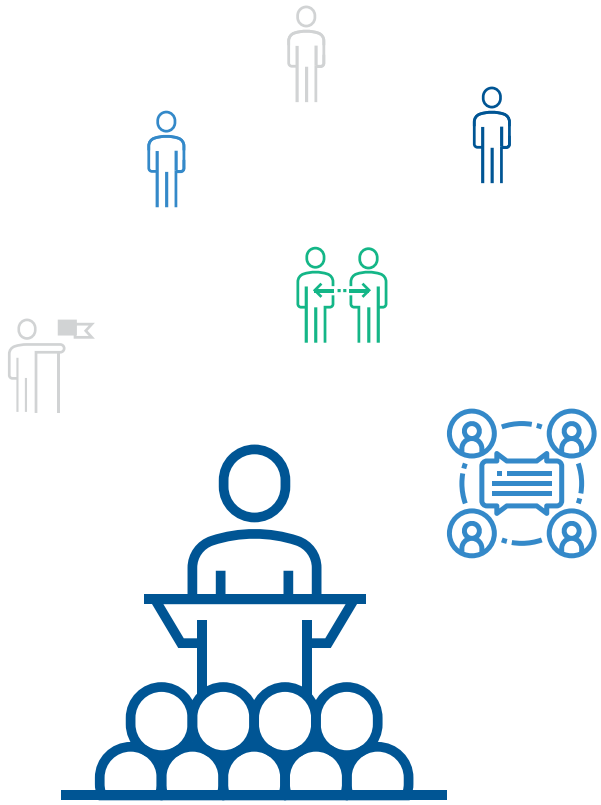
*Event Program & more information on page **94***



September 01, 2020 // Acorn Industrial Services is delighted to announce the appointment of its new Bearing and Maintenance Product Manager, Andy Fletcher. Andy brings with him 16 years of experience which he will put to use in assisting ACORN's customers with all of their bearing and maintenance requirements. Andy's previous experience includes nine years in NSK-RHP's Research and Design facility where he was responsible for application and engineering support for the European field-based team. In this role, he developed a deep technical understanding of the products and their design qualities. From here, Andy gained a further seven years of experience in NSK-RHP's UK Field-Based Application Engineering team. He benefitted from first-hand industry experience, seeing the bearings he'd previously designed being used in various applications. This knowledge and experience will enable Andy to assist customers with their application requirements, along with helping them to improve on the lifespan of their bearings and other components.

September 10, 2020 // Antifriction Components, which supplies critical moving parts for industry, has acquired the industrial arm of the BRT Group in a deal that will make it the UK's largest specialist distributor of its type. The multi-million pound acquisition brings together Bristol-based Antifriction, which has ten depots located largely on the west side of the UK, with Wisbech-based BRT Industrial, whose nine depots are mainly in the east, to create a UK-wide distribution network. The deal will allow the family-run BRT Group to focus on its strengths in the automotive market. The group is the UK's leading supplier of vehicle ball bearings. Founded in 1967, it is now run by the third generation of the family. As part of the deal, one of the family members – Phillip Clarke who is managing director of BRT Industrial – will transfer to Antifriction along with his 49 staff.

September 12, 2020 // Counterfeit Bearings intercepted in Russia. The mobile team of the Samara customs office stopped a vehicle heading from Kazakhstan to Russia on 12 September 2020 with counterfeit bearings on board. During the customs inspection, bearings were branded under SKF trademark, which is registered and protected in the Russian Federation. A request was made to the copyright holder about the possible detection of counterfeit. The representative of the trademark holder confirmed the presence of signs of counterfeiting, also pointing out the danger of using counterfeits. The damage to the trademark holder exceeds 700 thousand rubles. The rightsholder sent a request to the customs office to bring the perpetrators to justice, as well as the destruction of the counterfeit goods.

September 16, 2020 // HQW Precision's bearings chosen for world's largest mid-infrared telescope. Construction is underway in Chile to build the largest optical/mid-infrared telescope in the world. The Extremely Large Telescope (ELT) is scheduled to begin operation in 2025 and will be able to gather more information than ever before, vastly expanding our knowledge of the Universe. Bearing specialist, HQW Precision GmbH, is supplying super precision ZKLN bearings to the project, which will be used to accurately adjust the 800 mirrors positioned within the telescope. The telescope includes a segmented primary mirror, approximately 40 m in diameter, which is made up from an array of 800 smaller hexagonal mirrors of around 1.4 m each. The ELT will have approximately 256 times the light gathering area of the Hubble Space Telescope and is expected to provide images 16 times sharper than those from Hubble. The positioning of the mirrors is critical in achieving this.

September 22, 2020 // EPTDA, the leading executive association for industrial distribution distributors and manufacturers across Europe, the Middle East & Africa – announces the appointment of its new 2021-2022 Board of Directors and President, effective 1 October 2020. To help drive

the above objectives and the strategic plan, the EPTDA is also pleased to welcome Des Spillings, Managing Director, Acorn Industrial Services Ltd, UK as its new President. Mr Spillings' Presidential term will start 1 October 2020 and end in September 2022.

October 01, 2020 // The fight against fake bearings – unique data matrix codes make investigations easier. Apps such as OriginCheck from Schaeffler can help buyers detect suspicious counterfeit bearings. In 2020, the BPT received an inquiry from the customs office in La Spezia, Italy, where a container of suspicious Schaeffler-branded rolling bearings had been stopped in transit. Once the BPT specialists saw the photographs of highly suspicious goods submitted via the OriginCheck app, they headed to La Spezia to check for themselves. Their suspicions were confirmed: 1,236 counterfeit Schaeffler rolling bearings were on their way to Morocco. The BPT then requested the seizure of the goods, thus setting proceedings in motion to ensure the destruction of the counterfeit rolling bearings. Schaeffler sales partners regularly send inquiries regarding suspicious products to the BPT, who thoroughly review every single case. The data matrix code (DMC) – a unique code for each Schaeffler bearing – plays an important role here. Schaeffler has been able to identify duplicated codes on counterfeit products that had originally been applied to original Schaeffler products. These can of course only be counterfeits.

October 10, 2020 // SKF invests $50 million to strengthen its manufacturing footprint in North America. Approximately $30 million is being invested in expanding and automating manufacturing processes at the Group's factory in Sumter, South Carolina. A further $20 million is being invested in localizing manufacturing of Tapered Roller Bearings (TRBs) from China to an existing manufacturing site in Mexico. The transfer supports the Group's regional manufacturing ambitions and will strengthen SKF's North American product offering. The resulting improvements in flexibility and service levels enable the Group to consolidate its factories in Avon, Ohio and North Charleston, South Carolina into the Sumter factory.

October 15, 2020 // COC Inc., the mounted bearing units producer from Japan announce that they aim to replace all SN5 plummer block units in the world with COC SN units. COC Inc. declares that COC unitized SN is the only 100% compatible unit with SN5 standard in the world. Most of the manufacturers are using one size smaller bearings than the standard SN5 bearings. More information about this revolutionary product at www.crossocean.com/cx2sn-vs-sn5

November 03, 2020 // NKE Bearings were exhibitors at the 2020 Power Transmission and Control (PTC) Asia trade show in Shanghai, China. With a focus on power transmission and control, PTC Asia was the industry's largest exhibition worldwide this year. NKE (Shanghai) Bearing Sales Co., Ltd., part of NKE Austria GmbH in Steyr, Austria, presented a portfolio of standard and special bearings designed for demanding applications in mechanical and electrical drives, pumps, and compressors.

November 15, 2020 // Solve Industrial Motion Group announced today its formation and the uniting of three strong, established businesses in the industrial bearings and power transmission components industry. The brands include P.T. International (PTI) based in North Carolina, IPTCI Bearings headquartered in Minnesota, and LMS Bearings in Colorado. As a best-in-class supplier of bearings and power transmission components, Solve will be a one-stop resource for both metric and American standard products with an inventory of more than 25,000 SKUs of quality, lab-inspected components. With five regional stocking locations and plans to add more, Solve offers customers same-day shipping services through Solve Express.™ The primary sectors that Solve serves include food and beverage, agriculture, mining, steel, automotive, textiles, wood products, lawn and garden, and pharmaceuticals.

November 19, 2020 // As part of the further expansion of the Schneeberger Group, an additional site was founded in Poland. The new company Schneeberger Components Poland (SPO) officially started on November 19, 2020 and has already commenced operations, producing precision parts for the entire Group. This means that the production footprint defined as part of the long-term strategy development is being consistently implemented and further developed.

December 09, 2020 // December 9th of 2020 marked the 17th China International Bearing Expo, after organizers jointly cooperated to host two simultaneous exhibitions. The China Bearing Industry Association (CBIA), effectively banded together with the China General Machinery Industry Association (CGMA), to form the overall event. The exhibition that ran parallel to the Bearing Expo, was the "Tenth China International Fluid Machinery Exhibition (IFME 2020)." This joint event provided an additional opportunity for attendees, as the two industries are closely related. The 4-day expo took place within the National Exhibition and Convention Center in Shanghai with

the participation of 811 exhibitors from the bearing industry. At a time when the world is navigating the ravaging effects of the coronavirus pandemic, it has become a necessity for organizers of these largely attended events to prioritize health over all else. For this reason, the event which was originally scheduled to take place on May 13-16, was rescheduled to December 9-12.

December 14, 2020 // The World Bearing Association (WBA) a non-profit organization serving the public interest, announces the release of a new app, the WBA Bearing Authenticator, to help combat counterfeit bearings. The WBA, its member manufacturers and associations worked with oneIDentity+ to develop the WBA Bearing Authenticator, which is now available on the Google Play and Apple App Store for free download. The WBA app allows bearing customers, distributors, and customs officials to scan a QR or DMC code on the bearing packaging to identify whether that code is correct and known in the manufacturer's database. The WBA and its members have been fighting counterfeit products for years, working with customs officials worldwide to help identify and seize counterfeit products. The WBA is made up of three bearing manufacturing associations: JBIA representing Japanese manufacturers, FEBMA representing European manufacturers, and ABMA representing manufacturers in the United States.

December 20, 2020 // ICT Advisory Division announces dozens of **Merger & Acquisition** requests in the bearing & power transmission industry. The company with a strong financial, legal and technical consulting background in the bearing industry published a report of current open projects of companies which are on sale, with short company description and rough indication of yearly turnover, profitability and geographical location. In similar way, investors who request assistance in their acquisition projects are listed in a similar acquisitions list. The full report can be requested from m&a@consulting-trading.com.

January 5, 2021 // Acorn Industrial Services Ltd announces a new partnership with world-class power transmission giant, Gates. ACORN® will distribute Gates' premium quality range of power transmission products, including the best-selling POLY CHAIN® high-performance timing belt. Founded in 1911 as a small, family-owned business, Gates has over a century of expertise when it comes to power transmission products. Not long after making its debut, Gates invented the pioneering v-belt, revolutionising the power transmission industry. Fast forward to today and Gates has over 15,000 employees in over 120 locations across the globe. Gates' premium quality products can be found in almost every industry and every country. This new partnership with ACORN means that Gates' power transmission products will now be more accessible than ever.

January 11, 2021 // The Board of AB SKF has appointed Rickard Gustafson as new President and CEO. Rickard Gustafson will succeed Alrik Danielson and join SKF during the first half of 2021. Rickard Gustafson is currently the President and CEO of the SAS Group. Before joining SAS ten years ago, Rickard Gustafson was the CEO of the insurance company Codan/Trygg Hansa and he has held several positions within General Electric. He holds an MSc from the Institute of Technology at Linköping University, Sweden.

— Rickard Gustafson, new President and CEO at SKF

January 20, 2021 // Schaeffler starts mass production of electric motors. Schaeffler is now reaping the rewards of its decision to create a specific business division for electric mobility three years ago, at the beginning of 2018. The start of mass production for multiple products across all electrification levels is testimony to Schaeffler's successful engagement in the electric mobility arena and to its status as the technology partner for advancing how the world moves.

This year will see the start of the mass production of hybrid modules, hybrid drive units and all-electric axle transmissions. The basis of Schaeffler's electric motor production is a modular, highly integrated technology platform. Schaeffler's strong expertise in the areas of production and technology across all components of electric drive systems is the key to the successful industrialisation of products that are both technologically advanced and highly profitable. Along with a series of mass-production orders for electric motors in the passenger car sector, Schaeffler has recently reached another milestone by entering the heavy-duty applications segment for commercial vehicles. Schaeffler has announced a mass-production order for electric motors featuring wave winding technology, a technology that provides high power density as well as advantages during assembly.

February 01, 2021 // Bearing manufacturer NKE Austria GmbH has a new Managing Director: Matthias Ortner has been carrying out the duties of Deputy Managing Director in Steyr since October 2020. Following the departure of Managing Director Thomas Witzler the year before, Carlos Oehling, CEO of the Spanish parent company Fersa Bearings took over the function of Managing Director in Steyr. In Matthias Ortner, Oehling now has a deputy on site. There has also been a change in sales management: Stefan Weidmann is now responsible for bearing sales worldwide. Matthias Ortner (right) is the new Deputy Managing Director of NKE in Steyr, Stefan Weidmann (left) is the new Sales Director

Ortner joined NKE in 2018 as Director of Finance and gained further experience as HR Director and Head of Supply Chain Management. He has a Bachelor's degree in Business & 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. Weidmann began working for NKE in 2006 after graduating from the Business Academy in Steyr. He worked in internal and external sales for ten years, and in this capacity he was primarily responsible for the OEM business in Germany. From 2016 until 2019 he led the sales team for Europe, continued the development of OEM business in the strategic industries and expanded the aftermarket business through a network of trade partners.

Febaruary 05, 2021 // W+A Wälzlager- und Antriebstechnik GmbH announced a new partnership with Ewellix, formerly SKF Motion Technology. Through this cooperation, W+A is further expanding its expertise in the area of linear components. Ewellix is a leading supplier of Linear Motion Components and actuation solutions. The Ewellix Group operates nine manufacturing centers in Europe, North America, and Asia as well as 16 sales locations worldwide. Founded over fifty years ago as part of the SKF Group, Ewellix is still engineering solutions for industrial automation, medical equipment, mobile machinery, industrial distribution, and other industrial applications.

Bearing manufacturer *Michell Bearings* *celebrates* 100 *years*

UK bearing manufacturer Michell Bearings is celebrating a special milestone as this year marks its centenary.

In 1905, prior to the incorporation of Michell Bearings, founder A.G.M Michell registered patents in Britain and Australia for his tilting pad bearing invention, a concept which is widely used around the world today.

Now employing 182 people from manufacturing sites in the UK and India, as well as a global sales network, Michell Bearings began life with co-ownership between A.G.M Michell and Henry Thornton Newbigin, as well as four major shipbuilders in the North East of England; Cammell Laird & Co., Vickers, John Brown & Co. and Fairfield Shipbuilding and Engineering Co.

The adoption of Michell's tilting pad thrust block was revolutionary during the First World War. By the end of the war, Michell's more elegant state of the art design had replaced the larger, less reliable fore runners and it was estimated that the direct annual saving to the Royal Navy in coal and oil was around £800,000, which is the equivalent to £82 million today.

Steve Dixon, CEO at Michell Bearings,

said: “It is a privilege for us all to be part of history as we celebrate 100 years since the incorporation of Michell Bearings. The fact that the business has reached this significant milestone is a tribute to everyone, past and present, who has dedicated themselves to the success of the company."

The hard work of our employees is greatly appreciated and our efforts today are crucial to ensuring that Michell Bearings prospers for generations to come. “There’s no doubt it’s an unusual time to celebrate this centenary, and of course we are disappointed that we can’t have a bigger celebration. But it’s important that we come together in some way mark this special occasion."

The company occupied premises on Scotswood Road, Newcastle, where it was owned by Vickers and subsequently Rolls Royce until 2015. Now a member of the British Engines Group, Michell Bearings moved to its current facility in South Shields in 2015. Since the takeover, the company has seen considerable investment in both the UK and Indian facilities.

Michell Bearings India commenced production in 1995 within a 4,500 square meter manufacturing facility in Bangalore. Currently employing 59 members of staff, the facility plays a vital role within the business’ industrial market replicating the state-of-the-art manufacturing methods, CNC capability and cutting tool technology used in the UK.

In recent years, Michell Bearings has continued to grow and expand in markets such as hydropower, nuclear power and naval propulsion resulting in record sales in the last financial year. The past two years have seen the company manufacture its fastest self-contained bearing within the nuclear power industry, largest thrust block for naval propulsion, and largest horizontal bearing for a civil aerospace development application.

More recently, bearings for a nuclear reactor cooling pump application have successfully completed a station black out (SBO) test at the Michell Bearings facility. It is thought to be one of the world’s first successful tests in this context. The SBO test simulates an environment where a nuclear power station loses all electrical power and the successful operation of the bearings is key to maintain the safe onward operation of the nuclear reactor.

About

Michell Bearings designs and manufactures hydrodynamic white metal and PTFE lined bearings for clients across the globe. Founded in Newcastle upon Tyne in 1920, this year Michell Bearings celebrates 100 years of manufacturing products including horizontal bearings, vertical bearings and tilting pad bearings for the industrial, commercial marine and naval markets.

For more information please visit www.michellbearings.com

Keeping the food production wheels turning

Exploring innovations in polymer-based lubrication for the food industry

With 70 percent of bearing failure attributed to lubrication factors, bearing lubrication is a fast-evolving area of research, supported by academics and industry alike. Here, Chris Johnson managing director of EZO bearings supplier SMB Bearings, explains how new innovations in polymer-based lubrication could increase lubrication life, while reducing maintenance needs and contamination risks for food processing plants.

Food production is ramping up and reliability in the food chain has never been more important. Food and beverage managers rely on lubrication as the lifeblood to all rotating equipment, which keeps the food production wheels turning. Lubricants used in food and beverage plants must perform the same technical functions as a lubricant in any other industrial application, but crucially, they must also adhere to strict food safety standards.

Does your lubricant make the grade?

Historically, plant managers have had to sacrifice performance to adhere to food health and safety requirements. After all, contamination can lead to product recalls, halted production and spiralling costs. Most importantly, however, it is a threat to the health of the customer and unfortunately, contamination is on the rise. The Food Standards Agency (FSA) reported that in the year ending March 2019, there was a 36 per cent increase in allergy and food alerts in

England, Wales and Northern Ireland.

Contaminants can enter the food chain from many sources, such as contaminated land or water, handling and storage — and, less commonly, lubrication. Chemical contamination can occur through unintentional contact with unsafe lubricants and greases used in machinery.

While the Rapid Alert System for Food and Feed (RASFFo) is a key tool to ensure a swift reaction when risks to public health are detected in the food chain, a better option is to minimise risks in the first instance and plant managers can do this by ensuring they comply with food-grade lubricant regulations.

To prevent contamination, NSF International, the primary certification agency for lubricants used in food and beverage plants, classifies lubricants into three categories: H1, H2 and H3. The important distinction of food grade lubricants is that their unplanned contact with food and beverage products will not contaminate the item. Lubricants used in food processing machinery must be formulated to be innocuous in taste and odour and should not pose any kind of health risk to consumers should contamination occur.

Safety doesn't need to compromise machine performance

A lubricant provides a thin film between the contact areas in a bearing to reduce friction, dissipate heat and inhibit corrosion on the balls and raceways. This is hardly a new concept, but exciting innovations in food-grade lubricants are helping facilities to enhance their production efficiency and extend their equipment service life, while reducing the risk of lubricant contamination to food and beverage products.

Food-grade lubricants are effective under severe food processing operating conditions, such as exposure to high-pressure water jets, caustic and acidic chemicals, chlorine-based sanitisers and extreme temperatures. This means that lubricants must be resistant to wash-out and spray-out if they are to protect machinery from wear, rust and corrosion.

Ball bearings are traditionally lubricated with grease and oils, but this requires maintenance, leading to additional costs. Another potential issue is over-lubrication, which can result in bearing lubrication leaking out and contamination occurring. So, what is the alternative?

Polymer solid lubrication

An alternative option to greases and oils is polymer solid lube (PSL), which is gaining traction with food and beverage facility managers. PSL is a microporous polymer structure loaded with oil that fills the free

volume in the bearing between the races, rolling elements, and cage. During bearing rotation, the solid polymer releases the appropriate amount of oil to lubricate the rolling elements and raceways. Solid lubricants tackle various problematic scenarios in food processing, reducing the risk of leakage, reducing costs associated with relubrication and downtime caused by cleaning or bearing failure. What's more, there are various PSL grades available to suit specific conditions such as extreme temperatures or extreme chemical resistance.

For example, all-purpose food grade PSL have an operating range from -45°C to 93°C. In mechanical freezer applications, where low temperature operating conditions are required, PSL is an effective choice to minimise maintenance. In addition, solid lubricants can act as an additional barrier to protect against larger particles entering the bearing, extending bearing service life.

Innovations in food-grade lubricant mean that today's food and beverage plant managers no longer need to walk the line between equipment performance and food safety. Investing in an innovative food-safe lubricant for your equipment is a small price to pay to avoid the potential financial disruption of food product contamination.

For further information about SMB Bearings' food grade bearings and lubricants, visit the www.smbbearings.com

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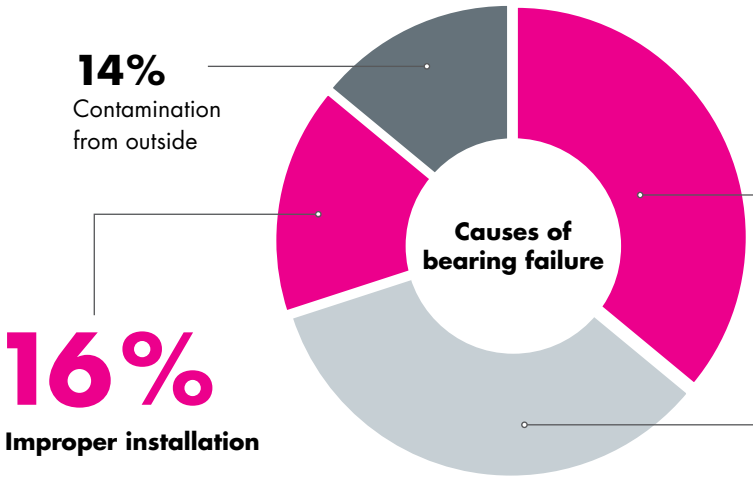

More information on p. 114

Over 16% of premature bearing failures are caused by improper installation. The lack of proper tooling and know-how often leads to new bearings being subjected to high levels of stress and sub-surface damage. This makes premature bearing failure inevitable. In order to prevent this, the correct procedure should be employed using professional, specialist tools throughout the installation process. Only in this way will the new bearings reach their expected service life.

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CASE STUDY

White Etching Cracks and the Danger of an Improperly Performed Oil Change

For many people, an oil change is simply a part of routine maintenance that is seldom given a second thought. Generally, as long as the lubricant is appropriate for the application and the oil changes are performed on schedule, this is fine. However, few realize the dangers posed by switching between oil formulations. An improperly performed oil change leaves residual quantities of the original oil. If the additives of the two oils are incompatible, this contamination can precipitate the development of white etching cracks in otherwise healthy bearings and quickly lead to premature failure. Recent research presented at the BearingWorld conference 2020 by Dr. Arnaud Ruellan et. al. (SKF Group) demonstrates that even a single additive can be the deciding factor in the development of white etching cracks.

Elgeti Engineering performs on-site inspections of large industrial gearboxes with endoscopy as a standard practice. A recent case in a wind energy converter clearly demonstrates the importance of both regular inspections and correct maintenance procedures. A damaged bearing was found less than a year after the last oil change in a gearbox that had been operating without issue for almost two decades. Our analysis showed that it was the oil change, performed improperly, that led to the development of white etching cracks and thus the failure of the bearing. This diagnosis has grave consequences for the remaining bearings in the gearbox as well as those in any other gearboxes serviced in the same manner.

— On-site inspection of the gearbox with endoscopy

Overview

During a routine inspection on the gearbox in question, endoscopy discovered significant damages to one of the bearings in the wind energy converter. Excessive foaming was also observed in the oil and a sample was taken for later analysis. The damaged bearing was removed and sent to Elgeti Engineering's laboratory for further analysis. Two different damage modes were evident in the visual inspection and a sample was taken for material analysis. The subsequent examination of the microstructure in 2 combination with the results from the oil analysis narrowed down the root cause and appropriate recommendations were made to the operator.

Visual Inspection

After documenting its condition upon arrival, the bearing was disassembled and cleaned. Multiple damages were present on the inner ring (Figure 2) while the outer ring had only a single point of damage (Figure 3). Both raceways as well as the rollers show signs of rolled over particles that can be considered as secondary damages to the inner ring (Figure 4). The presence of harder particles is also evident in the wear visible on the cage (Figure 5). Frictional wear is visible on both bearing seats, more pronouncedly on the outer ring (Figure 6), but this is unremarkable given the fits typically employed in the application. Aside from oil deposits, there are no further significant findings. Since the marks observed on the other components are clearly secondary, the focus will subsequently be on interpreting the damage to the inner ring.

Fatigue Damages in Rolling Element Bearings

The fundamental truth about rolling element bearings is that their lifetimes are finite. In principle, a fatigue damage can occur at any time – especially when the bearing has been in use for many years, as this one has. Fatigue damage is characterized by spalling on the raceway that first spreads across the width and then propagates around the circumference. The damaged surface has a regular, flaked appearance as in

— Figure 2: Some of the damage on the inner ring

— Figure 3: An isolated point of damage on the outer ring

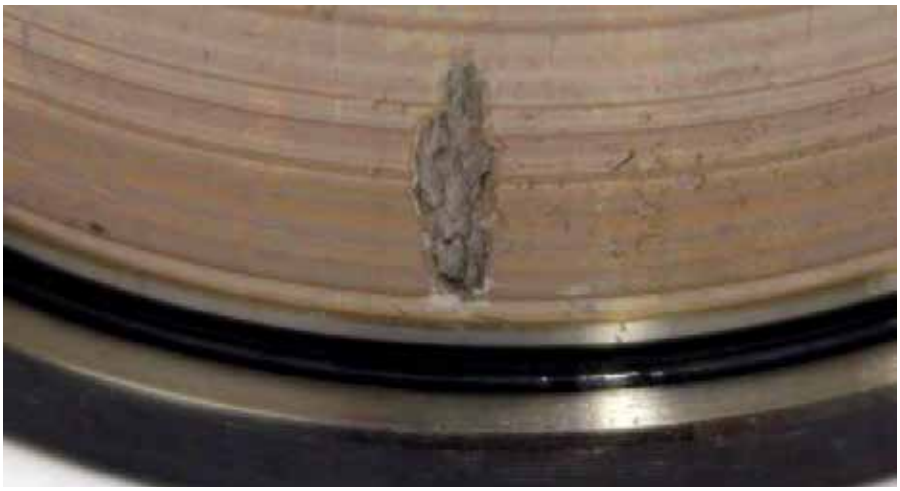
— Figure 4: A roller with particle impressions

— Figure 5: Cage with lubricant deposits and signs of wear from harder particles in the pockets

— Figure 6: Frictional wear marks on the seat of the outer ring

Figure 7. This image shows damage due to fatigue on a comparable bearing that was run under high load until failure on one of Elgeti Engineering's test rigs.

The extent and depth of the flaking is dependent upon the applied load. The rollers and rings flatten elastically



— Figure 7: Reference damage pattern from a high load test rig experiment conducted by Elgeti Engineering

under load to form a rectangular contact area. While the length is equal to the raceway width and remains constant, the width of the contact area increases with higher loads. The area of greatest material stress occurs at a depth equal to approximately 35% the contact width. Over time, subsurface cracks develop that run parallel to the surface. Material eventually flakes off, leaving a characteristic damage profile. Typically, fatigue damages only have a few sources – frequently only one – although the damage can then spread quickly. This is because the initial damage leads to a weakening of the surrounding material while the rest of the component remains intact.

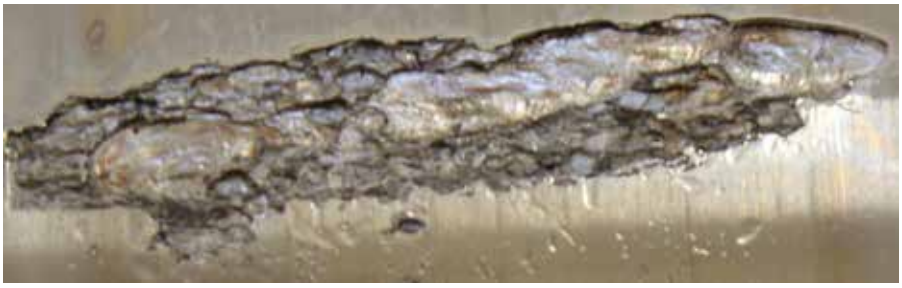
Causes of Multiple Simultaneous Damage Locations

If multiple damages occur within a short period of time in one component, as they have in this bearing, two conditions must be fulfilled. First, the load must be fairly low so that the progression of damage is slowed and more cracks are able to develop and reach the surface. Second, the component must be compromised in some other way so that there are multiple weak points in the material where cracks can begin to develop. These weak points must exert a greater influence than the cracks themselves.

- Three potential causes can be considered:
- Unrelated prior damage to the surface
- Poor material quality, e.g. many non-metallic inclusions
- Changes to the microstructure due to external factors present in the application

Neither of the first two options apply to the bearing in question. There are no identifiable unrelated damages on the surface and if the material quality were at fault, one would not have expected the bearing to have run for so many years without failure (the subsequent metallographic inspection supports this reasoning).

This leaves changes to the microstructure as the only remaining possibility. A close examination of the damaged areas shows two phenomena in superposition: rolling element fatigue that presents as fine flaking,



— Figure 8: Close up of a damaged area showing a combination of fatigue and embrittlement damages (marked in yellow)

— Figure 9: An example of an axial crack

and areas that are flatter and deeper (Figure 8). The latter fractures are characteristic of material embrittlement and it can reasonably be assumed that these areas appeared first and caused the fatigue damages.

Additionally, the axial cracks emanating from some of the damaged areas (Figure 9) are also typical of material embrittlement; more specifically, these cracks frequently occur in connection with white etching cracks. The primary suspect for the root cause of this embrittlement – and white etching cracks – is the presence of atomic hydrogen, which among other things can developed due to chemical degradation of the lubricant.

Metallographic Inspection

To definitively identify the underlying cause of the damages, a material sample was taken for metallographic inspection. First, the sample was polished in order to assess the cleanliness and crack network. It was then etched with 3% nitric acid in an alcoholic solution to make the microstructure visible.

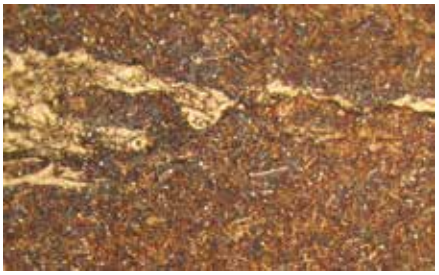
Overall, the cleanliness is good

— Figure 10: Manganese sulphide inclusions and oxides

— Figure 11: Subsurface cracks due to rolling element fatigue

— Figure 12: Chaotic crack network typical of embrittled material

— Figure 13: White etching area in an otherwise regular microstructure



— Figure 14: White etching areas

— Figure 15: Remnants of white etching areas along a fracture edge Lubricant

with only a few small inclusions, predominantly elongated manganese sulphide (grey) paired with oxides (black) (Figure 10). This degree of inclusions is completely normal and not of concern. The microstructure itself is very regular and shows that the bearing was made of high-quality steel and appropriately heat treated.

While Figure 11 shows parallel subsurface cracks typical of rolling element fatigue, Figure 12 shows a chaotic crack network that is indicative of embrittlement. Indeed, Figure 13 shows a white etching area visible as a lighter spot in the microstructure. These white etching areas are structural modifications associated with the presence of atomic hydrogen and which lead to a significant weakening of the material. When cracks develop from these areas they are called white etching cracks (Figure 14 and Figure 15).

Lubricant Analysis

The analysis of the oil sample showed that the wear particles were within the normal range. However, the composition of the additives did not match the database entry for the lubricant. The technician expressly states that the sample is likely to be a mixture of two different lubricants.

Summary and Conclusion

The examined bearing failed due to damage on the inner ring caused by a superposition of rolling element fatigue and embrittlement fractures. In this case, the fatigue damages were a consequence of the cracks caused by the embrittled material.

The metallographic inspection showed that the bearing was made of high-quality material which had nevertheless developed white etching areas. White etching areas develop in the presence of atomic hydrogen and lead to premature failure. It is reasonable to conclude that the failure was precipitated by the presence of atomic hydrogen. Other possible damage mechanisms cannot be plausibly associated with the observed damaged; explicitly discounted is the possibility that the bearing had simply reached the end of its lifetime.

The existence of white etching areas is closely connected to the presence of electrical currents and/or inappropriate lubricants. Electrical currents lead to an electrolytic decomposition of the lubricant and can additionally encourage the diffusion of hydrogen into the material. This phenomenon is frequently observed in assets that are not appropriately shielded. In these cases, the damages appear within a few months or years. Since the asset in question has been in operation considerably longer than that without issue, it can reasonably be assumed that such a problem was not present.

With respect to the lubricant, recent research has shown that even a single additive can cause white etching cracks to develop; such results were, for example, presented by Dr. Arnaud Ruellan et. al. (SKF Group) at the BearingWorld 2020 conference. Since white etching cracks develop quickly, it can be assumed with near certainty that running for a few months with a contaminated lubricant could cause the observed damage.

Aside from the findings of the lubricant analysis, the excessive foaming observed during the visual inspection of the gearbox demonstrates the incompatibility of the two oils, particularly the resultant failure of the foam inhibiting additives. This foaming is associated with chemical reactions that could help explain the development of hydrogen responsible for inducing the damage in the bearing.

Recommendation

Since the bearing failure was caused by a contaminated lubricant and the failure occurred in close proximity to an oil change during which the type of oil was altered, it is reasonable to conclude that the oil change was performed improperly. Consequently, it is essential to thoroughly flush and then relubricate the gearbox. The same applies for any other gearboxes that were serviced in the same manner.

White etching cracks can affect any and all of the bearings in the gearbox, and further damages can be expected in the coming months and years. It is therefore highly important to conduct regular inspections in order to detect these failures before they propagate and cause further damages inside the gearbox.

Finally, the maintenance procedures and training of the maintenance personnel should be investigated to determine the source of the initial error and correct it.

ELGETI ENGINEERING

Getting Around

Electrical Bearing Damage

Variable frequency drives (VFDs), or inverter drives, allow precision RPM and torque control of electric motors. In some applications, they can save up to 30% on energy costs. However, VFDs are not without problems, and can induce unwanted shaft voltages. Without effective protection, shaft voltage can result premature bearing failure and thus motor failure.

The National Electrical Manufacturers Association (NEMA) and other institutions recommend that new motors be equipped with effective bearing protection. But whereas insulation is designed according to the latest standards to protect the windings, bearings are often neglected. In order to be truly suitable for VFD operation, a motor should additionally have long-term bearing protection. Often, this is not given sufficient consideration, and this omission leads to expensive downtime.

Risk of motor damage during VFD operation

Damage to windings and bearings can result from the repetitive and extremely fast impulses produced by modern VFDs in the motor. VFD output voltage's fast rise time puts stress on the motor windings. Under some circumstances, "reflected waves" can produce voltage spikes up to twice as high as the drive's specified output voltage.

In addition to winding damage from fast voltage rise times, the imbalance of drive output voltage produces a voltage difference between the motor shaft and frame ("shaft voltage"). This leads to a voltage across the bearings, and this bearing voltage can cause arcing when it discharges. This arcing erodes the bearing surfaces and leads to premature failure. Each arc creates a microscopic pit, and in aggregate, these pits give the bearing a matte, frosted appearance. Over time, fluting occurs: A washboard-like series of ridges forms, resulting in increased bearing noise and vibrations. By the time fluting has developed, the motor will make a piercing screech when it runs, and the bearing must be replaced before it fails catastrophically.

— New bearing (left) and one with advanced electrical damage (right)

A new bearing and one with advanced electrical damage are shown in the figure.

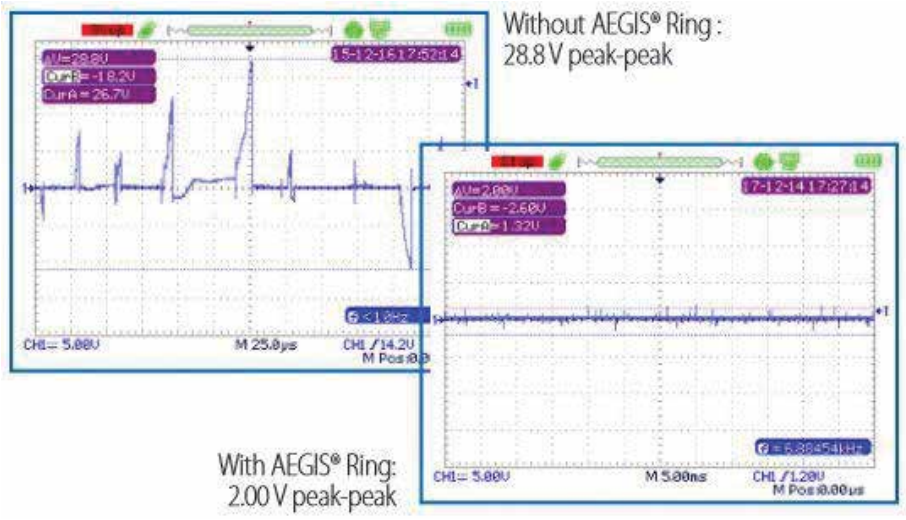
Electrical bearing protection

In most cases, a reliable and cost-effective way to minimize electrical bearing damage and increase the reliability of VFD-controlled motors is to use an AEGIS® Shaft Grounding Ring. (In addition to an AEGIS ring, motors larger than 100 hp/75 kW also require an insulated bearing at the opposite end from the grounding ring.)

AEGIS rings encircle the shaft with thousands of highly conductive

— AEGIS Shaft Grounding Rings

microfibers, which are secured in a patented FiberLock channel. The microfibers create a very low-resistance path from motor shaft to frame. Rather than arcing through the bearings, current from the shaft will instead travel through the grounding ring. The microfibers ride lightly on the shaft with very low friction, so they are much less subject to wear than other forms of shaft grounding. Moreover, AEGIS rings can be scaled up to arbitrarily large shaft diameters.



— Shaft voltage readings before and after installation of an AEGIS Ring

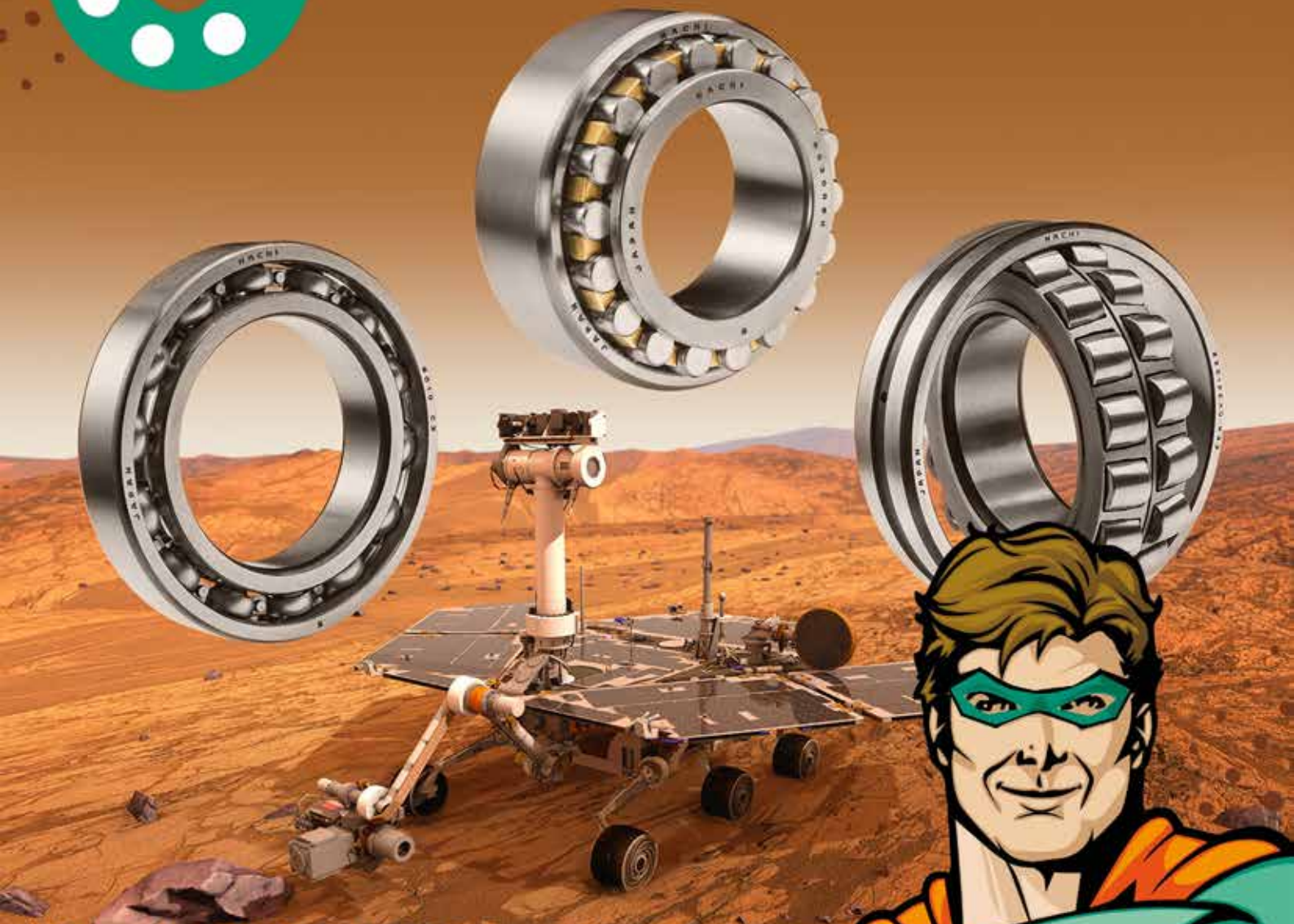
Simple proof of efficacy

The effectiveness of shaft grounding rings can be detected by simply measuring the shaft voltage with an oscilloscope. Without shaft grounding, the voltage profile appears in high voltage peaks and steep discharge edges. After applying the shaft grounding ring, a virtually flat line appears.

AEGIS Shaft Grounding Rings have proven their value in millions of installations worldwide, mainly in North America and Asia. Many motor manufacturers, such as ABB Baldor, WEG, and Regal Beloit, use factory-installed shaft grounding rings as standard or as options for certain motor series, so that the operation of the VFD does not have any harmful side effects on the motors.

You can check more details at est-aegis.com

NACHI



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The Man who will lead the EPTDA through the storm in 2021-2022

EPTDA, the leading executive association for industrial distributors and manufacturers across Europe, the Middle East & Africa, announced recently with great pleasure and honour that Mr Des Spillings was appointed as the new President, who will lead the strategic development of this unique association and community for the next two years.

We reached out to Mr. Spillings, for an interview where he could outline his vision for the future of the association and the PT/MC industry. As well as some key insights into the role an association like EPTDA plays during the current pandemic like COVID, to continue driving an entire industry forward.

Des SPILLINGS,
President at EPTDA

Q: First of all, we would like to congratulate you with your new position within EPTDA. We know that you have been serving the EPTDA as a volunteer on several committees and most recently as the Chairman of the Distribution Development Committee. How does it feel to become now the President at EPTDA?

Des: Thank you! Joining EPTDA as a volunteer helped me gain valuable insights on the PT/MC industry and market, but above all, it helped me connect with people working in the same industry from various countries around the world. It is a great benefit to be connected to such a large network of professionals and to be able to exchange ideas and best practice – we work in the same industry and the challenges can be very similar across companies so it can be really helpful talking with your peers and finding ideas and solutions that could be used within your own company. As a Chairman of the Distribution Development Committee and, at the same time, EPTDA Vice-President for two years, I took the time to pay attention to the EPTDA community, to see how people and businesses evolved and provide support to the former EPTDA President, Mr. Zoltan Arkovics. I think that this period helped me to be more prepared for the role of the EPTDA President – the times are even more challenging now, due to the COVID-19 crisis, but EPTDA has proved to be a strong community and I am sure that is going to remain the case in the future.

Q: Can you tell us more about your background and current activities?

Des: I have worked in the mechanical engineering industry for over 30 years, almost straight from school. I joined acorn in 1995 in an „inside sales" role and worked my way up through the company. Myself and my business partner, Melvyn Parsley, completed a MBO of the company in 2005 and 10 years later we sold the business to Axel Johnson International. Today I am still active as a Director at Acorn Industrial Services but my main role is divisional manager for Power Transmission Solutions at Axel Johnson International. Acorn joined EPTDA in 2001, so I was privileged to witness and to be involved in the development of both the EPTDA and the changes in the industry as a whole.

Q: How did the pandemic impact the activities of EPTDA so far? Which changes have been implemented since the start of the outbreak?

Des: I think I may say that EPTDA has been as affected as much as every organization by the COVID-19 crisis. The different (international) rules and restrictions put in place to stop the virus, prevented us from meeting and seeing each other face to face. We had to postpone our EPTDA Annual Business Convention in Warsaw and we moved as much as possible into the digital arena. Looking on the bright

> “EPTDA is a strong anchor of support for its members during the COVID-19 crisis.Our goal is to provide our members with as much relevant information as possible.”

side, we had the opportunity to see each other more often and to be in touch all the time, albeit virtually. We organized our different committees and Board of Directors' meetings via the online meeting tools available; EPTDA enjoyed its first Digital Summit in September 2020, where experts shared their knowledge with all EPTDA members, and we kept a close communication with our members. Of course, we are all looking forward to the moment when we can finally travel freely and meet each other once again – I think this COVID-19 crisis made us reevaluate the importance of human interaction.

Q: EPTDA held for the first time in its history the Annual Convention and the MDIDEX online with digital meetings. How was the result of these meetings? Do you think that this option and approach of MDIDEX meetings are here to stay?

Des: Indeed, for the first time in its history, EPTDA went fully digital with its well-known MD-IDEX meetings. The results were positive, considering the context and we were happy to include more members from our companies in these meetings. However, on the long-term, we do not consider the digital version of the MD-IDEX meetings as a permanent solution. As mentioned earlier,I think we all miss the face to face meetings and, although we are very happy that it is so easy to set up digital meetings these days, there are just some things that technology cannot replace yet.

Q: How do you see the future of the power transmission and motion control industries for the coming years ahead?

Des: It still has a big future. The industry will change but it has always changed. The simplicity of what customers really need doesn't move. They want great customer service and technical knowhow combined with a growing assortment of available products and services. This won't change. We need to make sure we understand what our customers want and not presume that we know what they want based on what they were content with before. How we provide those parts and services to our customers will change and evolve but I think we already knew that. Before covid we were all talking consolidation, Globalization and digitalization. Maybe the next couple of years will be a bit more back to basics.

Q: Which are the biggest challenges that manufacturer and distributor companies will face?

Des: Encouraging young,talented and aspiring people into our businesses and keeping them in our businesses will continue to be a challenge. The new working from home environment will make it easier for employees to move around, virtual interviews and never meeting your colleagues might have looked strange 12 months ago but it's a new world that is probably here to stay. Sustainability will also be a greater part of our working lives in the future and our ability to be agile and adaptable will be key to succeeding in the future.

Q: What role does EPTDA play towards its member companies during the COVID-19 crisis

Des: EPTDA is a strong anchor of support for its members during the COVID-19 crisis. Our goal is to provide our members with as much relevant information as possible. We have the Oxford Economic reports and forecasts that provide country by country analysis. We also have the PTMI reports that give monthly data on our market with data given by the leading distributors and manufacturers across the region. Our reborn leadership academy will also help aspiring employees of members in gaining extra insight into our industry.

Q: We know that the pandemic situation has changed some of our habits. Do you foresee any structural changes at EPTDA in the future, as a result of habitual changes at personal level within the member companies?

Des:. EPTDA has recognised that it also needs to change if it wants to survive and be relevant for the next 20 years. We will and have started to become a more efficient organisation while hopefully encouraging more diversity in our membership ,committes and board. We need to have a more active board, we are all volunteers but if we take a position on the board or a committe then we must take the responsibility and make the time that comes with it. We have a great succession plan in place but we must increase the transparency,clarity and understanding of the organization for our members.

About Des Spillings

Des Spillings is an experienced leader with over 30 years history of working in the mechanical power transmission industry. Mr Spillings also has a role on the management team of Axel Johnson International – PTS Division. Skilled in Business Planning, Business-to-Business (B2B), Account Management, Engineering, Continuous Improvement and People Leadership, Mr Spillings has been a crucial contributor to the delivery of EPTDA's 5-Year Strategic Plan. His personal journey, professional network and reputation in the industry mirrors the core values of EPTDA of Open Dialogue, Mutual Respect, Integrity, Honesty, Fairness, Continuous Growth and Continuous Learning. He has served as a volunteer on several committees of EPTDA, most recently as the Chairman of the Distribution Development Committee and Vice President of the EPTDA.

About EPTDA

EPTDA is the leading executive association for industrial distribution distributors and manufacturers across Europe, the Middle East & Africa, setting the highest commercial, environmental, social and ethical standards. Its mission is to advance distribution and strengthen members to be successful, profitable and competitive in a changing market environment. EPTDA vision is to be the leading community in the EMEA region for industrial distribution, as recognized by customers. EPTDA currently has a membership of more than 243 leading companies across 34 countries worldwide, working with some 320,000 employees and representing over €22 billion in annual revenues.

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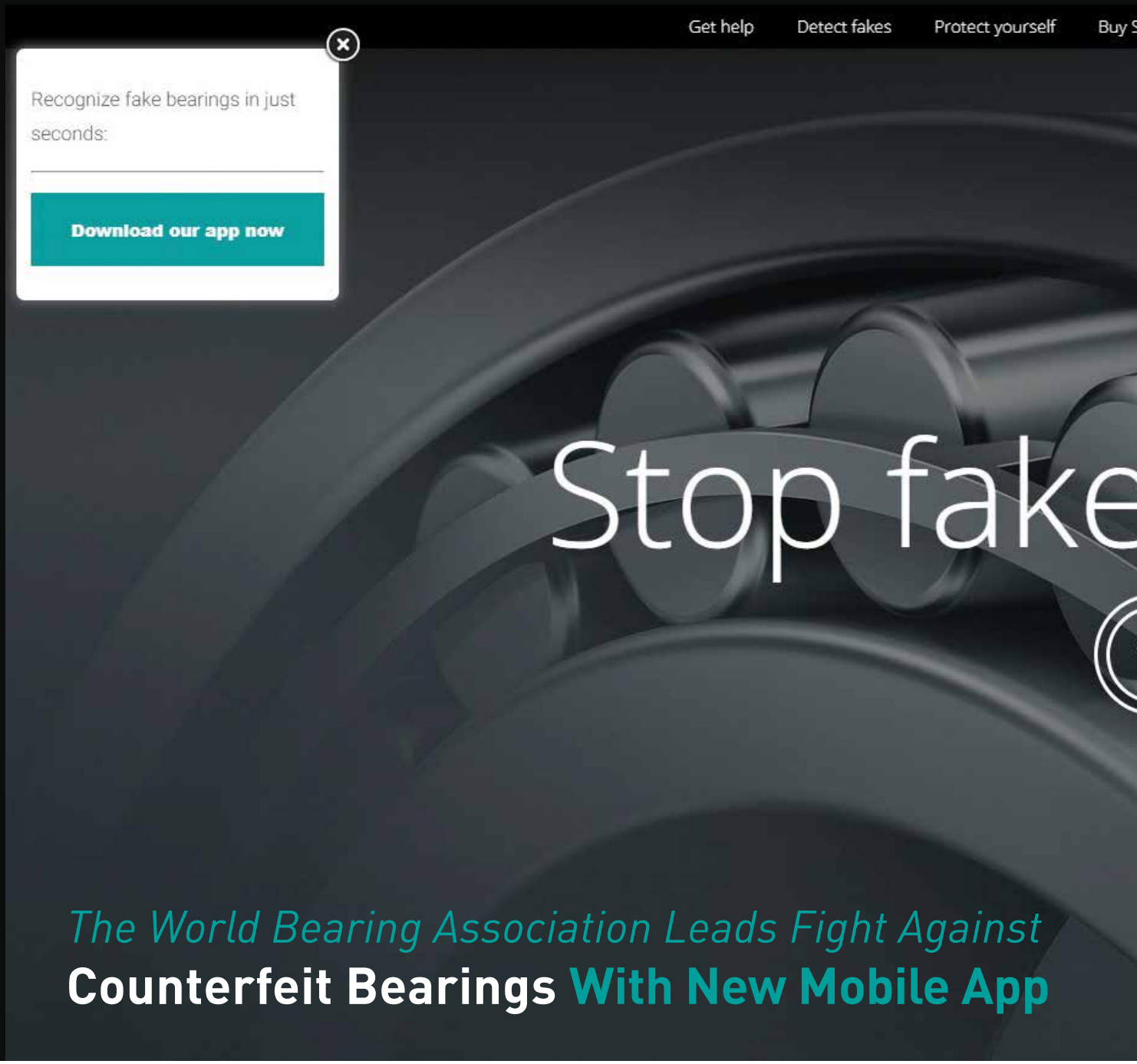


The World Bearing Association Leads Fight Against

Counterfeit Bearings With New Mobile App

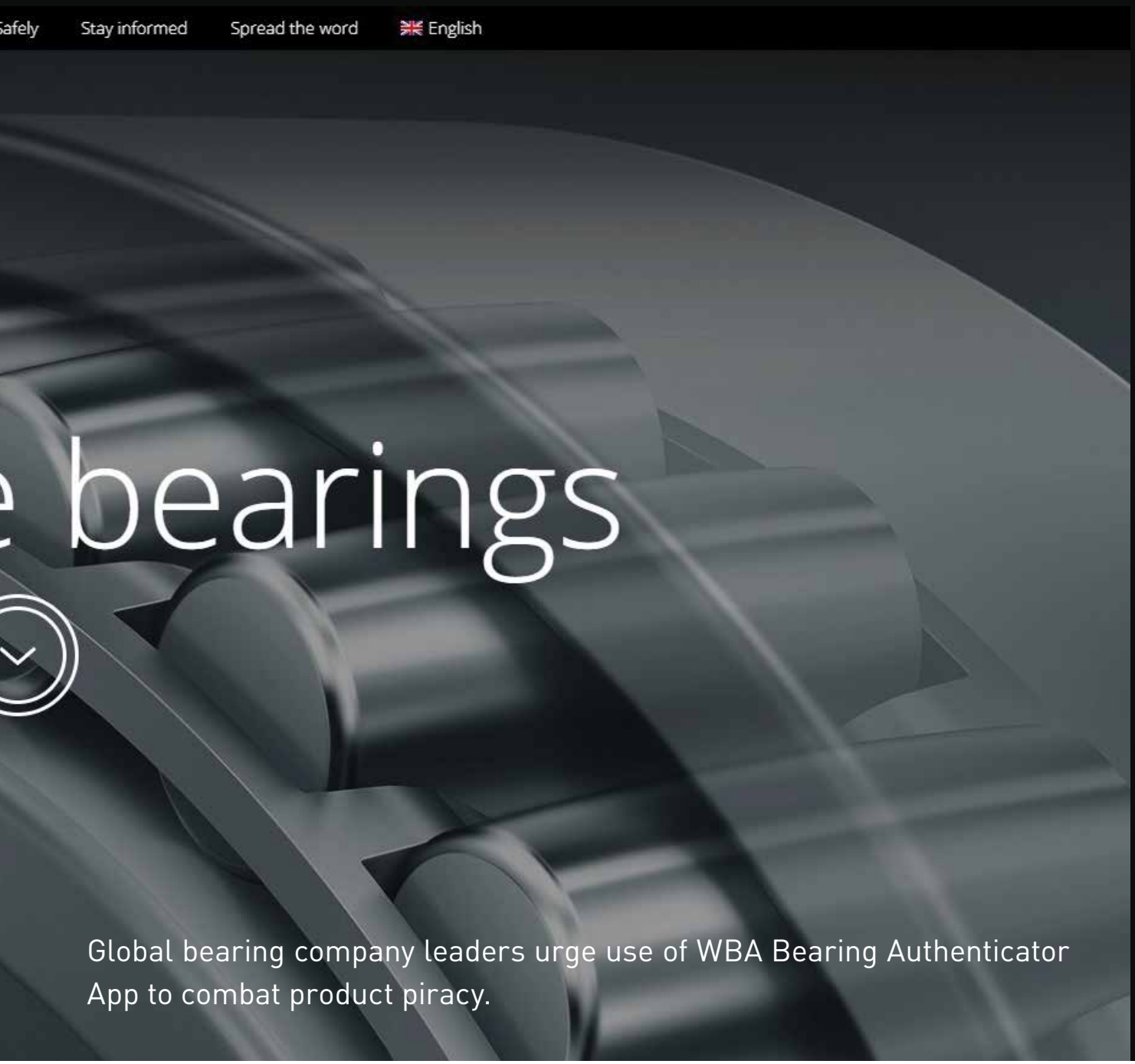
The World Bearing Association (WBA) a non-profit organization serving the public interest, announces the release of a new app, the WBA Bearing Authenticator, to help combat counterfeit bearings. The WBA, its member manufacturers and associations worked with oneIDentity+ to develop the WBA Bearing Authenticator, which is now available on the Google Play and Apple App Store for free download.

The WBA app allows bearing customers, distributors, and customs officials to scan a QR or DMC code on the bearing packaging to identify whether that code is correct and known in the manufacturer's database.

The WBA and its members have been fighting counterfeit products for years, working with customs officials worldwide to help identify and seize counterfeit products. The WBA is made up of three bearing manufacturing associations: JBIA representing Japanese manufacturers, FEBMA representing European manufacturers, and ABMA representing manufacturers in the United States.

"The app is a proactive approach to help customers and distributors to avoid selling and using counterfeit bearings. Counterfeit bearings pose a significant safety risk to bearing users and their operation, and the WBA is dedicated to making sure that customers are not cheated with counterfeit bearing products," said Alrik Danielson, President and Chief Executive Officer of AB SKF, and President of the World Bearing Association.

The bearings industry alone loses billions of dollars to counterfeit goods every year. But what is most alarming, is that these counterfeit products can be detrimental to the safety of end users.



Global bearing company leaders urge use of WBA Bearing Authenticator App to combat product piracy.

How Does it Work?

The WBA Bearing Authenticator app can be downloaded onto any mobile device via the Google Play or Apple App Store. Once downloaded, the WBA Bearing Authenticator app allows the user to scan a QR/DMC code on the bearings packaging. The app gives an indication of authenticity of a given bearing product by checking to see whether the QR/DMC is registered as a valid product code in a participating company's database and was not checked too many times.

The app then provides an indication of whether the code on the product is a correct code with one of three symbols:

- A green checkmark if the code is correct and is in the manufacturer's database;
- A yellow exclamation point if the code is correct but has been scanned too many times, which indicates that the user should contact the manufacturer to determine authenticity; or
- A red alarm symbol if the code is incorrect. The red symbol indicates the product is suspected fake and the user should contact the manufacturer for more information.

It is always recommended by the WBA and the manufacturers, that if there is no code, or the authenticity is in question, you should contact the manufacturer to be sure. Customers can easily reach out to the manufacturer directly to ask questions about the authenticity of the product directly through the app. The WBA Bearing Authenticator is currently supported by the leading international manufacturers -- JTEKT (Koyo), NACHI, NTN, NSK, Schaeffler, SKF, and Timken.

For more detailed information about counterfeit bearings or app download instructions, visit: stopfakebearings.com

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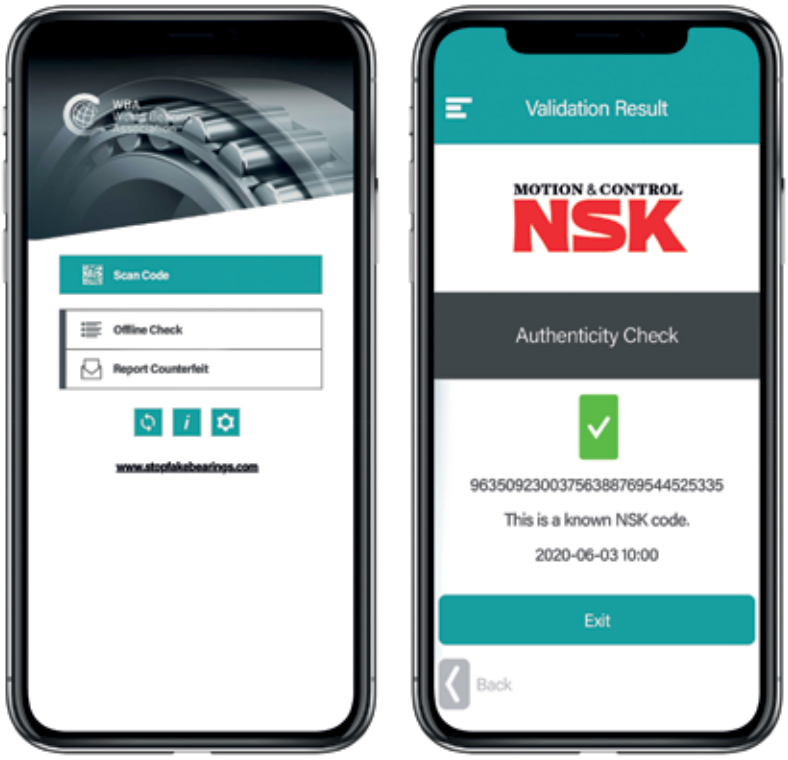
NSK initiatives combat counterfeit bearing manufacture

As a respected and coveted manufacturer of premium bearings, NSK has long been the victim of unscrupulous counterfeiters. Looking to cheat both the OEM and the user, those producing fake bearings will stop at little to deceive purchasers and boost the profitability of their illegal operations. However, NSK is fighting back with a range of measures that aims to nullify this corrupt practice.

To highlight the extent of the problem, around 23,000 counterfeit NSK packages and labels were recently discovered in Hebei Province, China, while a follow-up raid at another factory owned by the same offender revealed over 90,000 counterfeit bearing boxes and 10 imitation printing plates covering four major bearing companies, including NSK.

Upon examining the premises, the range of machinery and equipment in-situ indicated the level of capability many counterfeiters have at their disposal. Several machines for printing, laminating, die-cutting, creasing and cutting were discovered. Aside from the fake boxes, officials also found many stacks of uncut packages, most of which were NSK.

All products were confiscated and taken to the Market Supervisory Board (MSB), the local trademark infringement office.



— NSK has joined forces with the WBA to create a multi-manufacturer anti-counterfeiting app

Revealing the real cost

The acquisition of counterfeit bearings is not cost effective. Although such products may come with a lower price tag, due to issues such as poor-quality machining and the use of lower grade raw materials, they will almost certainly fail prematurely. Early bearing failure impacts on product/system reliability, introducing unplanned maintenance and repair costs, which in turn increase TCO (total cost of ownership). There is also a major cost associated with the subsequent damage to company/brand reputation.

NSK wants to protect customers by excluding illegal players and products from the market which have the potential to fail prematurely, most significantly, presenting an inherent safety risk. The aim is to eliminate the counterfeit syndicates, suspend counterfeit manufacturing operations and distribution channels, and take legal action against the perpetrators.

A big part of this effort involves co-operation with authorities in China. Partnering with customs and border control for instance, serves to protect against the outflow of fake bearings.

To complement these efforts, raid activities are also conducted by central and local government organisations.

— The 'NSK Verify' app allows customers to assess the authenticity of machine tool bearings

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- Business Due Diligence

Let apps do the work

Technology has a major role to play in the fight against replica bearings. A good example is the recently developed 'NSK Verify', a free app which allows customers to assess the authenticity of machine tool bearings by using their smartphones to scan a unique 2D barcode found on the box.

As the latest step in eliminating fake bearings, NSK has joined forces with the WBA (World Bearing Association) to create a new app that is applicable to multiple manufacturers, 'WBA Bearing Authenticator: WBA Check'. The WBA works globally to enforce the law on counterfeiters and eliminate fake bearings – including through app development. This nonprofit and unincorporated industrial association promotes the common, lawful interests of the world's bearing industry, such as open economic engagement, sustainable development and the protection of legal rights. NSK is an active member.

Similar in function to NSK Verify, the WBA Check app assesses the bearing authenticity of WBA member companies by scanning a compatible 2D barcode, making it easier for customers who use bearings from multiple manufacturers. Furthermore, if an unregistered bearing is detected, the app automatically notifies NSK.

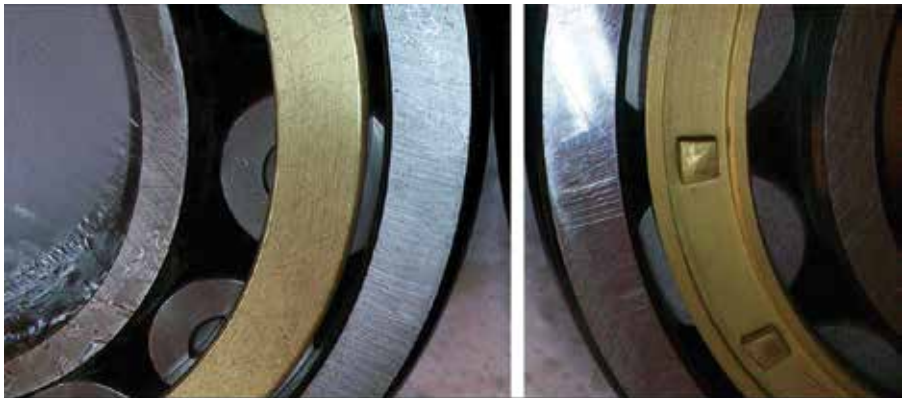
Use an authorised source

While apps are ideal for identifying fake bearings that have already arrived at the end user, a more preventative way of combatting the counterfeiters is to buy exclusively from Authorised NSK Distributors and Dealers. Such outlets obtain original NSK products directly from the NSK group and add value through the provision of advice, aftersales service and warranties.

— Using NSK Authorised Distributors assures customers of a genuine product

In tandem with all of these efforts, NSK regularly promotes the value of its brand to the market via brand protection activities, along with the provision of educational programmes for distributors and colleagues.

NSK is determined to bring counterfeit manufacture to an end and help customers enjoy the benefits of genuine, high-quality, reliable bearings.
The WBA Check app can be downloaded from the official WBA website at www.stopfakebearings.com/#buysafely

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Mineral Circles Bearings Reports Record-High Organizational Performance Amidst 2020 Pandemic

Dubai, UAE – Companies around the world were forced into unprecedented business transformations to adapt to the new face of both economic and business settings. A recent report presented by Mckinsey indicates that business areas around the globe have seen an acceleration on digital adoption of at least 7 years. This acceleration is years ahead of the average adoption rate compared to 2017 until 2019.

By 2022, KPMG is projecting that 80% of revenue growth will come from digital services and operations. With such a huge value to consider, how will companies whose business models built on traditional practices continue to thrive in the digitally-enabled business market?

Hear the story of how a company from the United Arab Emirates serves as a pacesetter in revolutionizing the aftermarket industry's business model.

Mineral Circles Bearings, a trusted technical service provider in the Middle East and Africa for the Automotive and Industrial Aftermarket, capped off the challenging year of 2020 with affirmative organizational performance results. Having known for its avant-garde and trailblazing initiatives, MCB seamlessly drove innovative business practices to hedge its organization from looming business fallouts brought by the pandemic.

Reinventing the corporate business model

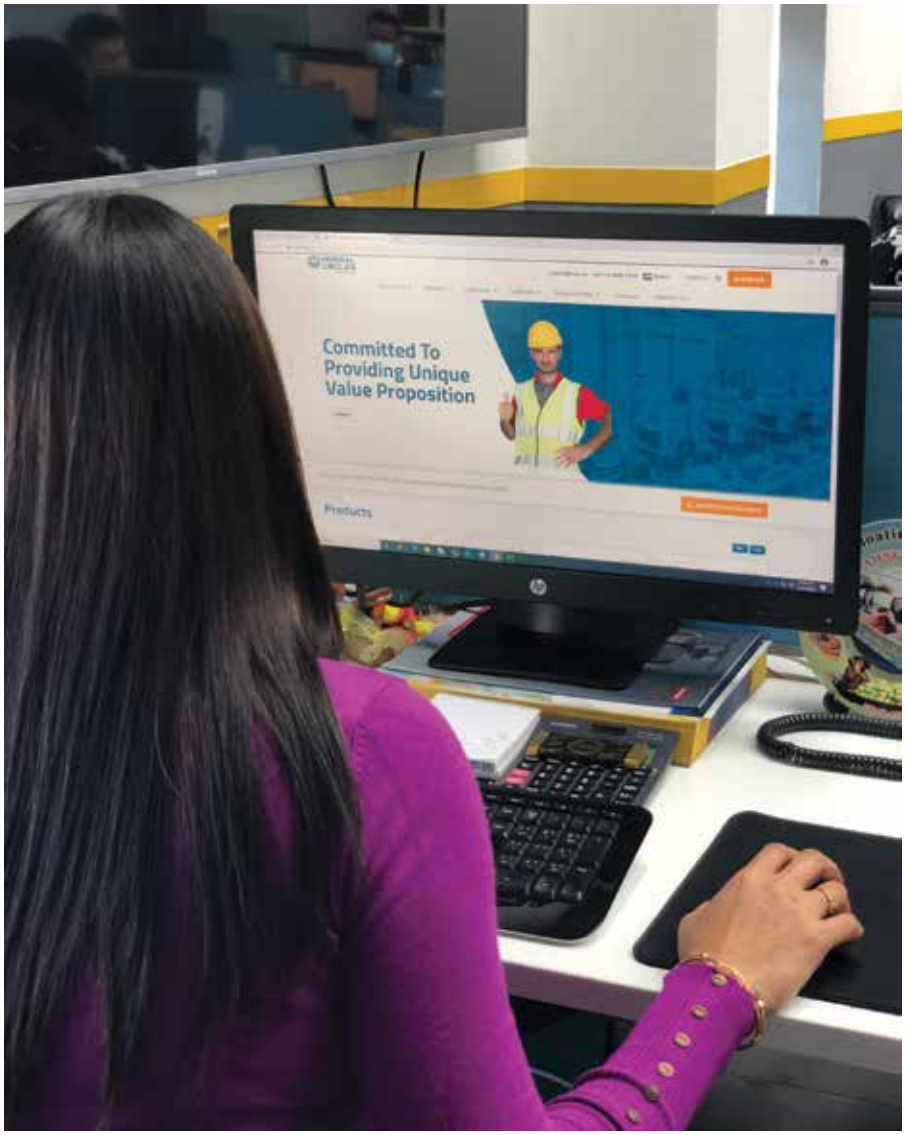
Mineral Circles has long started its organization's paradigm shift even before the COVID-19 outbreak transpired. With

its futuristic and strategic approach, it was without a doubt easier for such an organization to deploy a much more viable business game plan. Years before the unexpected surge of digital adaptation across different industries, MCB went on full throttle to invest in its digital efforts with its best effort to provide better service to its expanding global footprint. These lucrative contingency plans have been instrumental in the company's overall success as it allowed its whole organization to fully and seamlessly remain operational despite the abrupt increase in remote working.

"While the pandemic has put everything to a complete standstill, we have ensured that our organization and our people were fully-armored against any potential delays or abruption. This was made possible with our technology-driven strategies implemented years ahead of the pandemic which helped us simplify both of our internal and external transactions," Hassanein Alwan, Managing Director mentioned when asked how he took over the helm of the risk management planning to safeguard the company in the middle of a global crisis.

> "We aim to stay relevant and at the same time provide a unique value proposition to our customers regardless of the global turmoil."

"Our employees underwent certain digital training to fully utilize the available technology along with digital hangout sessions such as virtual coffee breaks to ensure that our productivity isn't compromised while everyone was working remotely at the comfort of their homes," Alwan added.



While most executives in the aftermarket industry had some quite of resistance to the role of technology in the business, MCB fully invested and prioritized its corporate digital transformation strategy to substantially adapt to the ever-changing market dynamics.

"It's more than just being merely present on different platforms. We aim to stay relevant and at the same time provide a unique value proposition to our customers regardless of the global turmoil," Alwan mentioned when asked what's the main driving factor for their digital transformation.

MCB's best efforts and unique ways of easing the process of doing business have won the trust of many customers resulting in at least 74% of its 2020 regional share coming from its market focus which are the Middle East & Africa. It's a consistent record-high regional performance for the past years despite of the sudden decline and business challenges globally.

Leveraging technology to simplify the customer journey

MCB has officially launched its multichannel customer service in the second quarter of 2020. With its ultimate aim to streamline the inquiry processes and to shape a new way of doing business, MCB strengthened its presence in leading Messaging platforms such as WhatsApp for Business, Telegram, and Messenger to provide a better service and unique value proposition to its customers.

What are the key takeaways?

Customers don't longer need to wait for 1-3 working days to check their requirements' availability. They can easily receive a quotation through their phones within a span of 30 minutes up to an hour. These channels currently support 5 different languages to provide clearer communication and service to its target customers.

On top of this, MCB ended 2020 as it proudly introduced its revamped corporate identity and corporate website. Its new identity represents a color palette that represents modernity and diversity in the organization while on the other hand, its revamped corporate website showcases its new user-friendly features aimed to simplify the customer journey.

A quintessential industry partner

COVID-19 has put into test the majority of the organization's ability to adapt to the ever-changing market dynamics. For MCB, it's imperative for organizations to earmark a quantum of their capital expenditures to invest in digital technology given that the world is noticeably transitioning into digitally-enabled business models. This will allow the organization to easily adapt to the ever changing customer demands, and would establish a stronger sense of reliability and business stability with its existing and future partners in the longer run.

About Mineral Circles Bearings

Mineral Circles Bearings (MCB) is a trusted technical service provider and bearing specialist in the UAE with a strong market base in over 65 countries across the globe. Since 1984, MCB has acquired distributorship of quality commercial and industrial aftermarket products such as bearings, belts, grease, chains, cv joints, universal joint, tools, and oil seal from leading brands (SKF, NTN, SNR, MBS, ILJIN, KBC, Musashi, Sedis and DAYCO) for the Middle East and Africa.

MINERAL CIRCLES BEARINGS

Configurators for engineers:

Focus on machine design – not on bearing selection


SKF

The way we configure our new car has improved lately. Now, configuration technology is doing the same in engineering offices. Just as we shouldn't need to be a car expert to configure the car, why would a gearbox design engineer need to be a bearing specialist to design that gearbox?

Choosing the right bearing for a new product has always been a time-consuming process. Design engineers need to consider hundreds of factors, many of which they need to estimate, in order to reach an optimum machine design.

Working in loops, a design engineer has to reach compromises. In a compact machine such as a gearbox, bearings compete for space with other components.

Designers need to consider assembly, and whether bearings will need to be replaced during its lifetime. They also need to ensure that the solution chosen will fit within budget and overall weight limitations, to name a few. This is the performance-cost optimization that every engineer knows well. Once you are through, there's the availability. If you are unlucky, you'll need to start again because the product you chose was a special one, with too long delivery time to meet the start of production (SoP) date.

With the first version of the new SKF configurator which is launched end of last year, we caught up with Victoria Van Camp, CTO at SKF, to hear about the impact of the configurators for the industry and the challenges that we are all facing due to the pandemic.

How did SKF react to the COVID-19 pandemic? Have there been any big changes in your strategy?

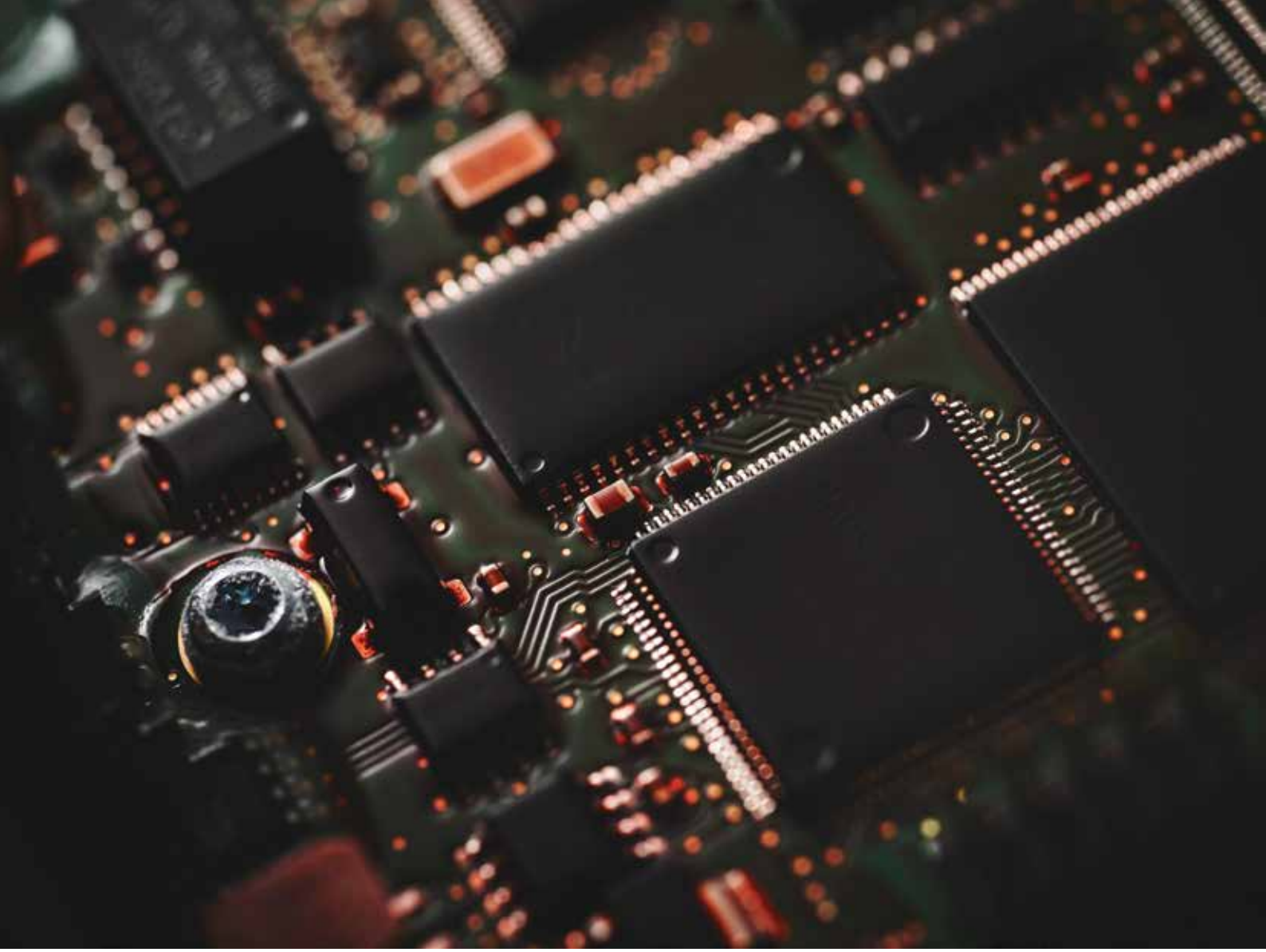
We reacted very fast and became much more flexible. We typically now have regular house meetings with the leadership, sales, manufacturing and engineering teams to keep everyone informed on what is going on at all levels of the company. That's been a powerful change for us.

What I see now is that there is of course, ups and downs, with some industries going up and other industries struggling, and different geographical regions are certainly going a different pace. What's required is not sitting around and crying over spilt milk. What you thought was the truth last week, might not be relevant now. And if you accept that you live in a changing world, it's better. And that was actually almost a relief during the spring, when that realisation hit home for us. It doesn't matter what we said two days ago, because now somebody shut down and we have to approach it differently!

> "We have managed to employ people during the lockdown phases, there have really been no limitations on employment. And this team was already very used to working remotely. Because they have contractors in Eastern Europe for more routine tasks, and they have a system for that."
>
> *Victoria Van Camp, CTO at SKF*

What's next, strategy-wise?

We've been thinking about what we can do to take care of making the company stronger, and how we can move out of the crisis. We've spoken a lot about mental health, making sure our colleagues aren't worried or panicking while isolating. We've all been much closer as a result, so our community has benefitted. We've since been looking at long term trends, like the green shift and circular economy which isn't new to us. And with less travelling and focus on what comes beyond COVID, we decided to just keep doing what we're doing. We've become remote with a digital focus, and we've just had to push the accelerator even further past. We don't have those two, three years guaranteed to do it now. So the mindset we adopted was also a beta. So we are in pain, our customers are in pain, how can we help them? Because customers will also not know what happens in the future. So is there something we can do now? So we put together a little package of sensors, apps, connections, that will be easy for our customers to



implement quickly, as an example. And that was a result of thinking, how can we help them through tough times?

Can you explain to us the core message of your presentation regarding "The Configuration Revolution"?

Configuration was certainly one thing that we already had in the SKF strategy, but we realised this very clear fact, nobody wants an engineer on site in the current climate. While the configurator is certainly not the solution to everything, it certainly will ease the work for us and the customer together. In the future, we will likely see the customers doing at least the simple configuration completely themselves. And when the more difficult stuff happens, we'll be able to help customers to solve issues themselves. So the configuring absolutely came out of focusing on how we can do even advanced engineering remotely. To do it now, and to accelerate it.

Can you tell us more about your presentation regarding R&D in an outcome-based business environment? How can you summarize your message?

In a way we always work in an outcome based environment. But on a technology readiness level, where you start from research, to prototype to release. That's the linear way of thinking. And while yes, there is an outcome, that outcome is very far away when you work in the research area. So what we did was to compress it, but we also put it in parallel. So to the researchers, we have made it very clear that electric vehicles, for example, are a key area, and we can't wait for 10 years until your research becomes something, we act now.

We are working with customers, and this, to me, is outcome based R&D because you frequently have to see what the outcome is. We obviously can't endanger the customer, but we feed all data back into research. Now the customers actually communicate what worked or what didn't or they report a new problem which needs addressing. So we've learnt that it's best to keep the end fairly close in mind. It's a sort of long term view with a real short term delivery approach. Science is still science even when you work like this.

What do you mean with the 3 A's? Agility, Accessibility, AI (artificial intelligence)

With agility, it was the realisation that we needed to be much faster in our processes. COVID 19 taught us that lesson, and it's a lesson we will never forget. Because everybody in business tried to sit and predict the future at the same time. We always only have a one year business plan, and we have five year technology plans. But that's not agile, actually, at all. Being agile is to admit to yourself that the world changes. The world is a fluid thing.

Victoria Van Camp,
CTO at SKF

So the big learning out of that is don't cry, because the world changes and new technology is needed. If a customer goes somewhere else, or a competitor shows up, then you just have to be better, faster, And if you think about software development, they make assumptions, they test it out with the customer and they take in the feedback, they make the change. You make things more accessible this way.

> We always only have a one year business plan, and we have five year technology plans. But that's not agile, actually, at all. Being agile is to admit to yourself that the world changes. The world is a fluid thing.
>
> *Victoria Van Camp, CTO at SKF*

The configurator is one way of looking at accessibility that just makes our products easier to find, easier to design and users don't need to be a specialist to get its value. You don't have to be an expert to mount a bearing. And so many engineers have this idea that expertise is so important, and that you lower yourself to some kind of bad or low-quality level if it's too easy. Something can arrive with ease and be good!

Where does SKF currently stand today with automated machine learning? Is it already widely applied with customers or is this all just starting now?

It was when we acquired the company Presenso in October of 2019. When we started, we did not do the sort of classical owners approach of integrating or putting the company in a separate little incubator. Instead, we took this company and the first thing we did after acquisition was to start training SKF people in the software that they had. The second thing we did was get them started working with a real customer case, on a big contract that we have, one of the big service contracts with lots of data points.

We have managed to employ people during the lockdown phases, there have really been no limitations on employment. And this team was already very used to working remotely. Because they have contractors in Eastern Europe for more routine tasks, and they have a system for that. So with their system, we have been able to keep working with customers during COVID. Just doing remote. So we have experimented ourselves a fair bit.

How will AI affect the overall accepted manufacturing models?

I have to say it's very hard to make predictions there. But you can see that AI is being used to detect phenomenon, that us humans just can't fathom. Because AI can see connections between so many patterns. So what appears to be completely unrelated, actually is not unrelated. It could be the connection between the type of paper you are making with the type of maintenance you're doing, with the changes that you did to your procurement three years ago. It's really those patterns that are going to be changing. And we don't even know what they are.

I think the hardest thing for us humans, is to accept these patterns. Because they will be to us like a mystery that can't be solved. We can't really start arguing with the AI because we won't be able to see what the AI sees. So how do we make peace with living based on the AI recommendations?

Which part of the world/countries will have the highest market and rapid increase in demand for AI in the near future?

Everywhere, but very much in developing economies. America, for sure. You certainly see China and Asia. It's almost like in China, people didn't used to have landline phones, and instead they had to basically go out in the street and talk in a phone booth. But they went from there straight to smart phones. So, the smart phone use just went through the roof. And now you can see the same with AI. If you come from nothing, then you take the new technology, rather than going through all the old stuff, that gives them speed in production. You don't have the luxury to sit and be afraid of AI, you take all the tools that you can, and you see where it takes you.

What are the features of SKF's Fibre Optic bearings?

We recommend it for measuring load. You can either use it to predict (if you know the load of a bearing) how much longer it will last, that sort of thing that you need to know. But the other thing is you can also use it as a kind of scale up for the machine. A bearing could measure what's happening inside a washing machine, and alert you when something is wrong. There are other ways of doing this, but they're not very precise. And they usually rely on electronics, which is not so good. You can't really put electronics inside a bearing because it gets messy; there is oil, there is rust, there's water.

So the fibre is a glass fibre, it's the same as what delivers the internet to our home so well. It's light that goes to a fibre and we take such a fibre, wrap it in a very small tract around the bearing, and then it goes to a device that translates changes in the bearing. This way, the bearing suddenly becomes something you can use to measure low power. You can use tonnes of data flow in all kinds of things. It becomes so much more than a bearing, actually.

Can you tell us a little bit about your personal background and other activities you get up to outside of work?

I'm a mother of two sons who are now in their 30s, so I try to spend time with them. They cook for me these days. I taught them well, I think! I live in Gothenburg and I have a summer house with a pretty big garden out north. So, I do gardening, I love gardening. And in the dirt, you see things happening, but not fast. Things change slowly. And you don't think about bearings when you're out there!

Technical and Compliance due diligence activities of ICT Advisory in Bearing Merger & Acquisition projects

M&A projects have been widely impacted in 2020 by Covid-19. Average deal value and volume contracted respectively of 22% and 49% respect to year 2019. Many deals have fallen by the wayside due to the uncertainty that the pandemic has generated to the worldwide economy, especially in those cases involving small and medium companies. On the other side, the large and financially strong companies have intensified the acquisition projects trying to take advantages of the special offers available in the market.

In any crisis, there are discrete, strategic opportunities to acquire high-quality talent, intellectual property and capabilities, often in distressed situations. For those in a position to acquire, these investments can be critical to long-term resilience while also helping distressed companies preserve capabilities and talent versus facing potential insolvency. Even in bearings and power transmission industry there are opportunities of concluding great deals with aim to strategically reinforce the company's equity and know-how.

Experiences of past crisis shows clearly that those leaders who leverage M&A well as part of a holistic response to the crisis over the next 12-24 months will be more likely to overcome uncertainty and outperform those who do not in the next three to seven years.

ICT Advisory is an "atypical" organization made of chartered accountants, lawyers, tax experts and engineers who are specialist of bearings industry and who can assist those leaders who intend to relaunch and to strengthen their companies entering an acquisition deal. In the same company, in fact, financial and technical competences are available at once to complete the whole due diligence processes that are strongly recommended to assure the buyer about the acquisition itself: in addition to the financial certification of the company performance, ICT team can assist in completing the verification of compliance to the laws and the absence of pending future liabilities for the buyer.

ICT Advisory engineers are expert of anything related to safety and environmental compliance of both manufacturing and non-manufacturing sites. The typical compliance due diligence activity includes the following steps:

- Documents analysis and check of compliance with the current legislation;
- Analysis of the aspects related to the protection of health, safety and environment, with respect to the production cycle;
- Inspection at the site under investigation, with collection of objective evidence;
- Identification of anomalies (findings: Non-Conformities, Observations

and Recommendations);
- Final report to the client, with estimate of the relative costs, consequent to the findings found in detail on both anomalies already found and of which the objective evidence is clear and on potential or non-evaluable liabilities;
- Drawing up of conclusions.

In case necessary, in agreement with the buyer, ICT Advisory can execute verification of pollution of soil, aquifers and air through specific spot measurements or by on-line control of them for the required period of time. This approach is essential to guarantee that any remediation activity needed to establish normal conditions in the site are adequately taken in account in the M&A deal.
In the same way, company risk assessment is completed and properly "translated" to the client for opportune consideration. Such assessment includes also the evaluation of the conformance of machinery and tooling, the appropriateness of the organizational model and its compliance with the requirements of the law, the compliance of central plants and of fire system, the proper handling of hazardous substances and the adequacy of the wastes management system.

ICT Advisory engineers can also complete business due diligence of target company and strategic assessment of its fitting to the buyer organization. The technical and commercial competences of ICT will support the forward-thinking leaders to take a holistic approach, making necessary short-term moves for stability and resilience while keeping opportunistic growth plays on the radar, where possible. It will also help to make rapid prioritization calls on M&A activation, to decide what should be put on pause, what should be shifted to a different timeline and what should stop. For new moves such as divestitures, ICT Advisory shall help to decide if seeking an exclusive arrangement or an auction; in case of alliances, ICT will help to define the most critical elements in the ecosystem to address, and to identify potentially new partners most able to solve these needs, to evaluate opportunistic plays with long-term potential upside, to start with another look at the investment strategy for in-flight and near-term deals, to evaluate opportunities to place bets on assets such as insolvent start-up IP, talent acquisitions, and distressed tuck-ins. Since the flow of these opportunities can come fast, having a clear idea of what is on strategy and what is not is essential.

Of course ICT Advisory can offer such assistance also on the sell-side. Being a qualified partner for the industry, our engineers can play a technical reference role and dialogue with the buyer's advisors. ICT Advisory Division aims to become the reference advisor for all company sales, partnerships and acquisitions operations in the bearings industry in Europe, Asia and America. For more info get in touch with them writing to m&a@consulting-trading.com

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We succeeded, what is next?

Back in the fourth quarter of 2019, SDT team assisted LUBExpert implementation (parallel to Condition Monitoring implementation) in wastewater facility in SE Europe, with primary target of improving lubrication practice on 180 assets (more or less 700 bearings).

This task might sound simple and straightforward, still it highly depended on many real condition facts. A relatively small team was working on several improvements at the same time: Condition Monitoring (CM) and Lubrication. A small team, in this case, means: two technicians engaged in CM activities, one grease technician and the maintenance manager playing the role of reliability engineer, lube manager, CM engineer as well as many others. Certainly, it was not an easy task for the team, and certainly it was not as it should have been, but that was the reality and what was approved by decision makers.

Obviously, that was one of those situations when management gives you less than you need to success promising to give you more once you succeed. Catch-22, but it is something we face often, making the process more challenging and rewarding.

To make it happen, our grease technician was trained to the level of LUBExpert Strategist, understanding Why job needs to be done, What needs to be done and How, and being able to perform entire setup, execution and reporting. Proper selection of lubricants, controlled purchase process, proper storage, cleanliness... all was included in process, of course. Once started, the gained experience resulted in growing confidence, increased work efficiency, well organized work orders and smooth execution. Once grease guy, now LUBExpert Strategist.

However, there was another aspect of implementation that was highly important for the success of the entire program. Do more than required with less than needed. Critical point of implementation was the proper positioning of each department (CM and Lube) and interdepartmental cooperation, considering available resources. The approach applied (knowing LUBExpert's capabilities) was to erase departmental fences and silos and set it more like an army formation:

- first line of defence – grease bearings right and eliminate mayor cause of failures;
- scouting – frequent data collection and trending, share data and locate anomalies;
- light calvary – collect dynamic (TWF, FFT) data for analytic purposes;
- heavy artillery – deeper analysis, problem definition, root cause definition (and elimination).

Lots of work and lots of tasks for a small team.

As usual, Pareto's 80:20, fits in from all angles. 80% of problems come from 20% of activities, 20% of problems require 80% of available time to be analysed ... and so on. Although it may sound ambitious, we assigned first two tasks to our Lube team/technician:

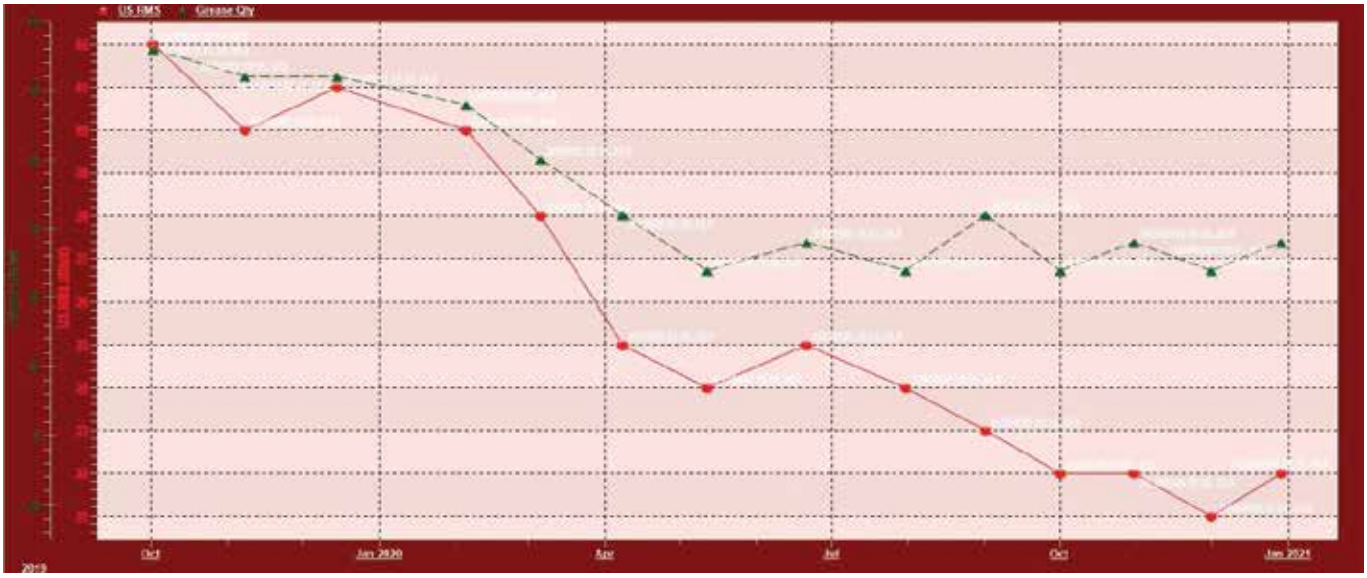
- ***First line of defence – Lubrication department job, for sure***
- ***Scouting – CM job, normally***

Some call it a burden too big, some think it is impossible, we consider it integral part of LUBExpert strategy. Whoever is taking care of Lubrication, has his hands-on assets more frequently than anyone else in the Reliability team, and has the most interactive relationship with the asset. LUBExpert Specialist (in this case also Strategist) is collecting data for Lubrication purposes, has an opportunity to monitor and trend data before and after replenishment condition, possess the data collected and analysed during replenishment.

Knowing that, LUBExpert Strategy easily takes care or the first two tasks, bringing huge benefit to CM team by giving them the most valuable data, and consequently time! More available time for deeper analysis, problem definition, root cause search.

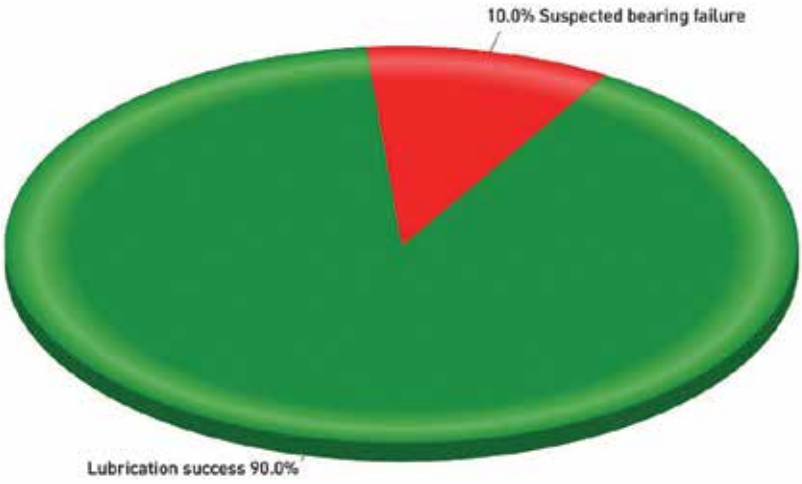
At the end of the first year of the LUBExpert program implementation:

- Lube technician took care of 35 – 40 bearings per day (per shift)
  - That includes work task preparation, data collection, on-site analysis based on triggered alarms, LUBExpert guided grease replenishment, data overview and possible strategy corrections, and reporting.
- All bearings showed an excellent response (as one in the picture 1 below), operating at minimum friction and wear level:



— Picture 1

- Process statistics (as shown in picture 2) showed high level of performance, correct lubrication practice and strategy settings, as well as additional observations and condition assessments:
- Q4 2020 compared to Q4 2019 shows significant decrease of bearings related failures in rotating assets;
- Q4 2020 shows no Lubrication related failures, except ones inherited from previous period;
- Full traceability and detailed data about each process achieved;
- Data shows that most of the previously used interval and quantity plans were incorrect;
- LUBExpert Strategy was successfully implemented.



— Picture 2

In addition:

- Lube technician delivered 12.500 Ultrasound readings to CM team, including static trend graphs, triggered alarms, before and after grease replenishment values, all relevant events, all taken actions;
- Lube technician delivered 18 "Suspected bearing failure" warnings to CM team;
- Lube technician delivered 10 "Safety risk" warnings to everyone's attention.

First year of implemented program can now be safely declared as successful.

As usual, once you succeed, there comes the question: **"What's next?"**

For Lube team, "next" equals expanding the program to the entire plant and sustaining top performance.

For CM team, "next" equals covering more assets, covering more failure modes, digging deeper into analysis to define a root cause, suggesting corrections to remove root cause and suggesting improvements.

So, first, we need to look at the accomplished results and assigned tasks, once again emphasising the necessity to remove departmental division and silos mindset and conclude that both tasks are actually one. The question that we really needed to answer was: "How can Lube team further assist CM team to accomplish more with less or same resources?"

Again, more work on Lube tech shoulders?

Not really, the answer is:

LUBExpert Dynamic.

LUBExpert Dynamic is equipped with an additional feature: collects Dynamic data (TWF, FFT) while performing usual LUBExpert work. No additional time needed, no additional training needed, no additional efforts, only additional benefits. Those benefits are exactly what CM team needs to accomplish.

Now, out of four army style operating segments, we can add one more to Lube team without creating any additional stress on our Lube tech, but freeing huge amount of time for our CM team:

- ***First line of defence – Lubrication department job, for sure***
- ***Scouting – CM job, normally***
- ***light calvary – collect dynamic (TWF, FFT) data for analytic purposes***

What does it mean for Lube tech during his daily work? Absolutely nothing.

Dynamic data is collected in background. Remember this from above?

- Lube technician delivered 12.500 Ultrasound readings to CM team, including static trend graphs, triggered alarms, before and after grease replenishment values, all relevant events, all taken actions.

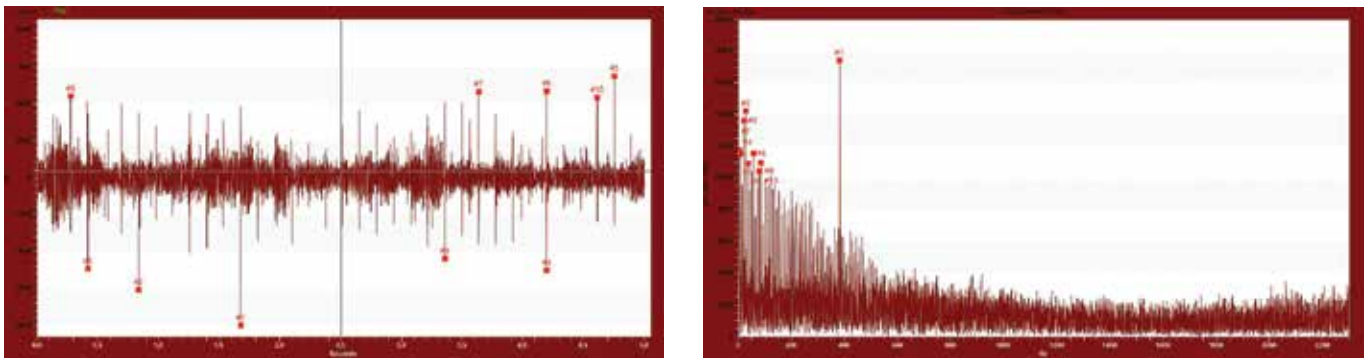
Now add same amount of Time Waveform and Spectra, that normally requires the work of an additional technician.

One more task off the shoulders of CM team and a huge opportunity for them to increase coverage, dig deeper and have more time for analysis and problem solving.

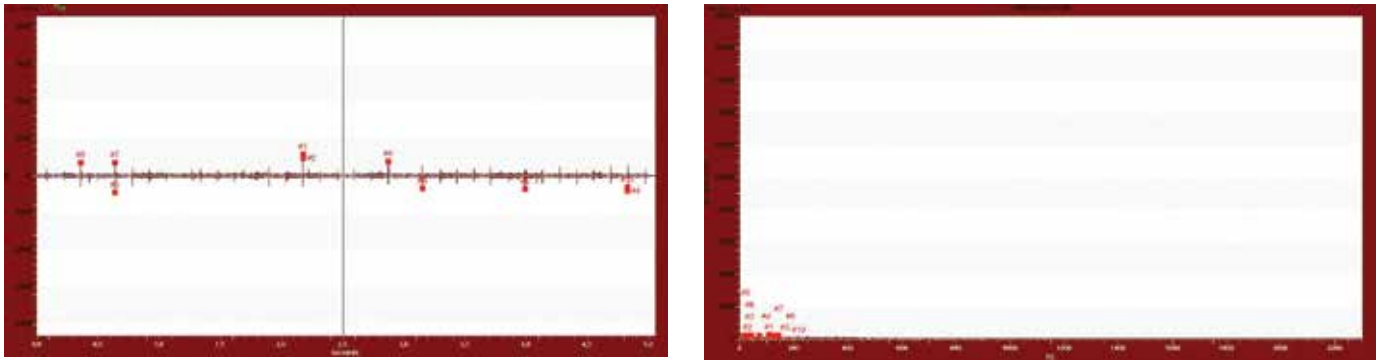
Each Condition Monitoring team knows exactly how big this benefit is and how it improves CM efficiency.

Here is how it looks like in first week of implementation. Bearing successfully greased with declared condition as "Suspected bearing failure", TWF and Spectra collected before and after grease replenishment (picture 3):

BEFORE GREASE REPLENISHMENT



AFTER GREASE REPLENISHMENT



— Picture 3

Lubrication as part of Condition Monitoring? Well, shouldn't it be that way?

The first line of defence has just become a Maginot line.

Reliability and Productivity:
The Foundation of Automated Warehouses

The logistics and warehousing industry has been undergoing a period of immense change, most notably in recent months due to the coronavirus pandemic. Demand for online deliveries has gone skyward, and retailers have had to adapt rapidly. Customers are shopping online all over the world and automation is becoming fundamental to the warehousing and logistics industry - particularly for online retail products sold in volume.

What type of automation is used in warehouses?

Automated warehouses are efficient, fast, flexible and reliable. They allow for improved warehousing, goods distribution, and optimum material flow. An automated warehouse uses a few key pieces of technology, such as an automated storage and retrieval system, which consists of a variety of computer-controlled systems for automatically placing and retrieving loads from defined storage locations. Central to these systems are the components that guide and transfer a component around the system. Whether it's a linear actuator to vertically retrieve a part from high racking or a ring system to rotate an autonomous picking robot, linear and rotary products play a key part.

Automated Storage Systems; think vertical

As with nearly every industry, space is a premium and a key benefit of an automated warehouse is its utilisation of space. Only a small footprint is needed as space is used in a vertical capacity, with high rackings going up to the ceiling. Whereas pick and place operators are limited by their height to reach products un-aided, automated storage and retrieval systems are limited only by the size of the system designed, thereby increasing the storage capacity. Whether it's a rack driven system transporting boxes vertically or a robot climbing shelves to collect orders, space

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maximisation is easily achieved. Indeed, one of the global leading online retailers use HepcoMotion's DLS4 belt driven linear actuators to vertically transfer products through a food filling station. Comprising belt-driven linear modules, an AC motor/inverter package and a range of compact planetary gearboxes for use with servomotors, Hepco's DLS4 saves hours in design and specifying time. Here, a belt driven carriage unit vertically transports boxes up to a height of 4 metres to transfer a product, and then back down again. This process is repeated up to 300 times an hour. Working with food items and a required operating temperature of between -5° to +40°, this is a challenging environment requiring a corrosion resistant actuator; Hepco's corrosion resistant DLS4 (CRDLS4) was specified. A high duty application, with longevity of utmost importance, Hepco is able to provide an impressive 10 year life span for this application.

This system required a height of 4m, but any desired height can be achieved with the DLS4s. Hepco's DLS4 are supplied in sections in any length to 8m as standard, and can be butted together to the required height. Any size warehouse space can therefore be accommodated, ensuring space is maximised. The system can also easily grow in a modular way – a key benefit to ensure future-proofing.

Automated Storage Systems; think modular

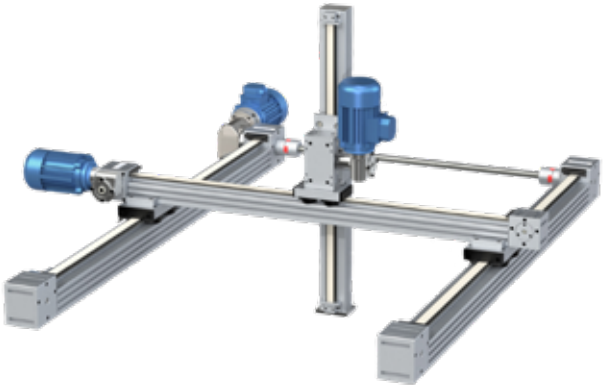
Traditional static warehouse solutions can struggle to cope with the changing needs of the industry. Scalability, adaptability and flexibility are at the very core of Dublin-based Eiratech Robotics, innovators of a mobile goods-to-person robotics automation platform. In the Eiratech warehouse environment, autonomously guided vehicles (Eirabots), operated via a wireless network, bring racks containing the required product to the picking station where the product is picked and packed. Minimal infrastructure is required; the system can be easily installed, extended and moved.

At the centre of the system (quite literally!) is Hepco's heavy duty ring guide. The HD ring is used on the turntable of the robot to rotate the robot in different directions. Specified to handle millions of rotations in its lifetime and the ability to work with axial loads up to 700kg, the ring also has to manage radial and moment loads in order to accelerate and decelerate a top-heavy rack. A slewing ring could not be used as an open centre was needed to enable a camera to read a barcode placed on the underside of the payloads. Having worked together before, HepcoMotion was the first choice for Eiratech. A custom HepcoMotion HD ring was used, with a bespoke outer gear. Maximising efficiency and improving accuracy, Eiratech offers an enticing automated solution for warehouses.

Reliably reliable

With the focus on speed and consistency to achieve quick orders, reliability of components is crucial. The introduction of so-called dark factories, run entirely

by robots with no need for artificial light or human presence further compounds the need for reliable systems. Unplanned downtime can be a manufacturer's worst nightmare, potentially causing a backlog of products that can cost the company thousands. If a customer places an order with a next day delivery expectation, being just a day late is extremely damaging to the company.



HepcoMotion's proven V guide technology is consistently used for this very reason; reliability. Used across a broad range of industries and applications from harsh, dirty environments, to clean room environments and everything in between, HepcoMotion's durable products provide a long system life. Celebrating its 50th anniversary this year, Hepco has a strong heritage built on a wealth of experience. Reliability has been proven time and time again with over half a century of applications. A further benefit is that spare parts are available for old systems - even those bought 50 years ago - providing much-needed longevity to investments.

Keep downtime down

Consumers now expect their online purchases to be delivered faster than ever before, which means those responsible for shipping and delivery need to operate around the clock. As such, many warehousing operations operate a 24/7 schedule. Minimising downtime is therefore key. Systems that can deliver continuous operation, without the need to be regularly stopped for routine maintenance such as re-lubrication, are highly valued by designers and production engineers the world over. Hepco's V guide system has far longer re-lubrication intervals than ball rails for example, which means less frequent maintenance and less downtime required to keep them running. More so, even in the event of no lubrication, the V guide system will not fail catastrophically if it ends up running dry. Whilst this will reduce the system life, it is a useful feature that provides essential peace of mind in case a re-lubrication interval is delayed or overlooked for any reason.

With regards to bearing maintenance, speed is again key. When Hepco products show signs of wear, the process is simple and does not impinge too much on production time. The eccentric adjustment facility of the V bearings can be used to quickly and simply remove any play that has occurred. Moreover, when the V bearings reach the end of their calculated life, they can be replaced individually, and not as an entire set, saving both time and money.

Coronavirus has caused behavioural shifts in consumer habits that has strong implications for the warehousing sector. The rise of online shopping has undoubtedly fuelled growth, placing new demands on the warehousing sector with a greater focus on efficiency and productivity. Automation is a crucial component in the future of this industry, providing an agile and effective response to logistical challenges. With over 42 major product lines with thousands of individual components, Hepco's range of products can meet practically any warehousing requirement. Designed to offer high reliability to facilitate maximum productivity, HepcoMotion's range of products are well-placed to serve this demanding, high duty industry.

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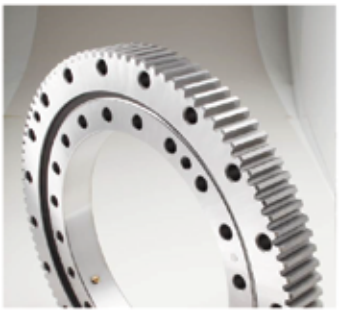

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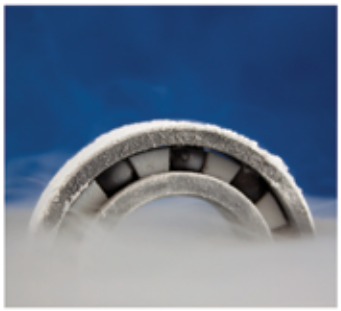

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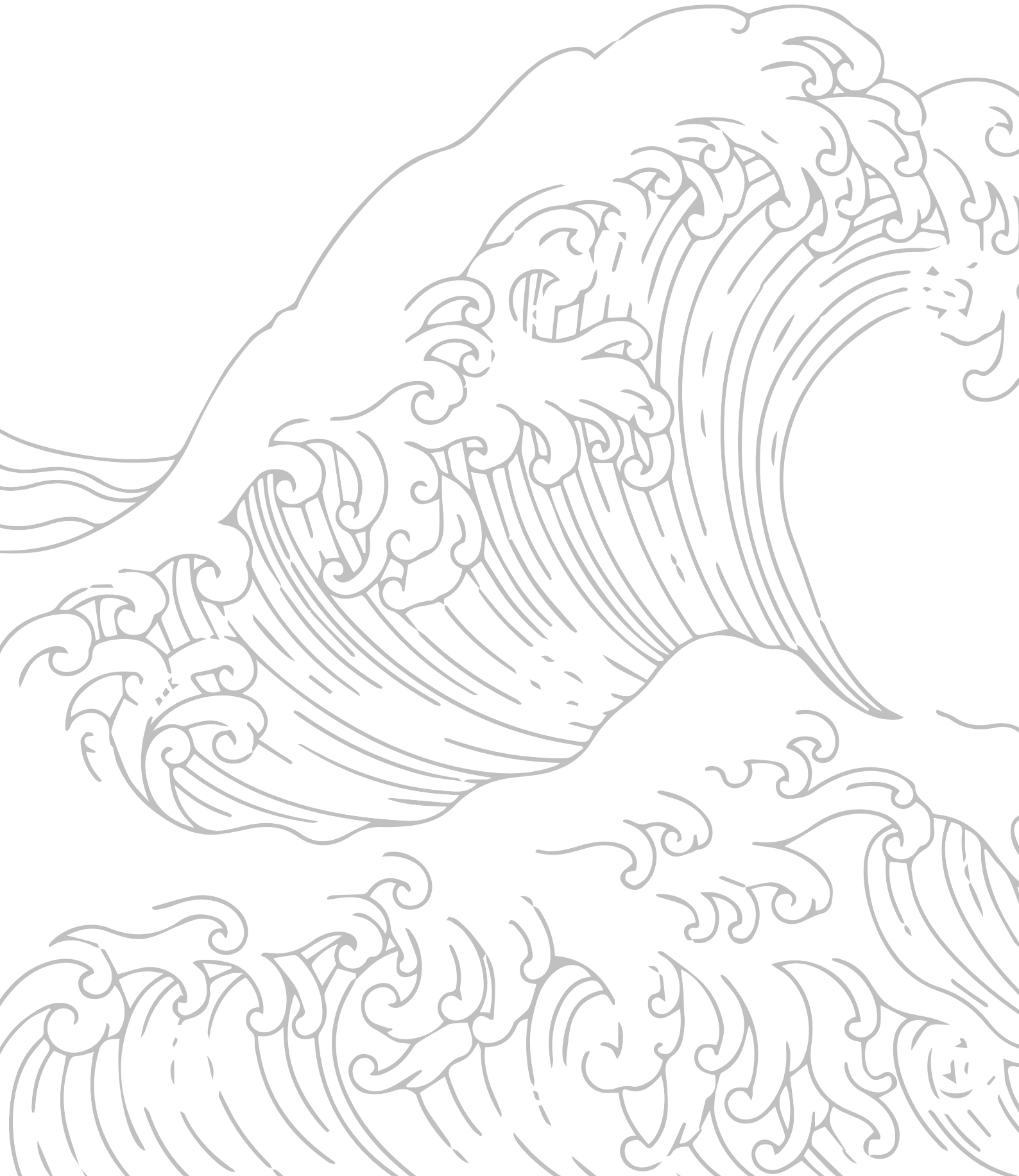


a TRADITION of INNOVATION

Mounted Bearing Units

There is currently a silent revolution ongoing, at the shadow of the pandemic, in optimizing the design, functionalities, mount-ability, and traceability of mounted bearing units. Several bearing producers are trying to upgrade their product and add new functionalities to it. While one of these companies, already implemented key innovations at the mounted bearing units, which reduces the total cost of ownership of the end-user by -40% through its unique design, outstanding quality, and optimized mounting capabilities.

The company behind this unique product is COC Inc. We have tried to reveal the story behind this revolutionary design and innovation of the COC mounted bearing units, during an interview with Eiichi Kobayashi, Chief Executive Officer at COC Inc. and the former President of FYH bearings. Eiichi Kobayashi's story is one with full of passion for quality, and a 70-year long tradition of innovation.

Can you tell us more about your background and history of COC Inc.?

COC is short for Cross Ocean Company, it may not sound like a bearing manufacturer, some people think that it sounds like a surf shop.

I love the mounted bearing units and I think most people don't even know what mounted bearing units are. My father started to make mounted ball bearing units for the first time in Japan in 1950. That was FYH bearings. He was a keen engineer and designed machines to make those bearings and made them by himself. So mounted bearings were always part of my life. My father told me he studied the bearing design from Seal Master catalogs for his first bearings. His unique machines allowed a tight fit between the inserts and housing. The inserts were interchangeable with any other unit. Other manufacturers including Seal Master had to choose the inserts and housings to find the right fit for assemble and they weren't interchangeable.

> "My focus was to produce the best for the customers although some distributors might not like the products getting a longer life, so they could sell more bearings."

After studying in California, I worked at FYH USA in Illinois and visited the Seal Master factory in Aurora. That was late 1980's and before they closed the factory over there. I had the meeting with their manufacturing manager Mr. French and he brought the very first FYH catalog from his book shelf. He said, "your father copied your designs from us and now we are asking you to produce parts for us." and laughed. The OEM business was running only for a couple of years because of the Anti-Dumping Duty against Japanese bearings started at those times. Since then, I traveled around the world to promote FYH and built one of the largest bearing factories in China exclusively for mounted ball bearing units. I also worked with other manufactures like KOYO (JTEKT) and TIMKEN for many years.

FYH is a family-owned company and the board members were my relatives. I often had disagreements with them about the way to do business. I cared very much about every detail of the product and was always looking for the new designs. The other board members didn't like the idea of spending money to change the designs because they said the distributors have never asked for it. My feeling was that we were the experts on mounted bearing units and should always be pushing to make a better product that would last longer. My focus was to produce the best for the customers although some distributors might not like the products getting a longer life, so they could sell more bearings. I was the youngest board member and the president of both FYH and FYH USA at that time. However, I grew tired of the arguments and decided to leave FYH.

I left FYH in 2018 and would have retired, but I still loved mounted bearing units so much and decided to finish the projects which I could not finish at FYH.

My other love is surfing. I surfed every day when I was young. I traveled many places around the world to surf. I usually carried three to four surfboards depending on the destination. The only problem was the board bag to travel. The padded board bags at that time didn't fit correctly and they were hard to carry. So, I invented the new board bag which was expandable to be able to change the length of the bag to fit the different sizes of the surfboards. It was made with the combination of plastic hard shells and padded covers to protect the surfboards perfectly. I had often gotten dings on my surfboards traveling by airplane. My surfboard bag design had two wheels at the end of the bag and I could carry the heavy bag easily. I made the prototype and all my surfing friends liked it very much. The plastic hard shell needed a mold to make it and I made 50 pieces of them to cover the cost of the mold. I founded the company to sell my own design surfboard bags. That company was Cross Ocean Inc. founded in 2001. The company was just an online web shop and suspended the company operations when the last bag was sold, since I was too busy with FYH.

> "For spherical roller bearings, it is important that the seal lips keep the same pressure during shaft misalignments, otherwise the outside air can find its' way into the inside of the bearing easily."

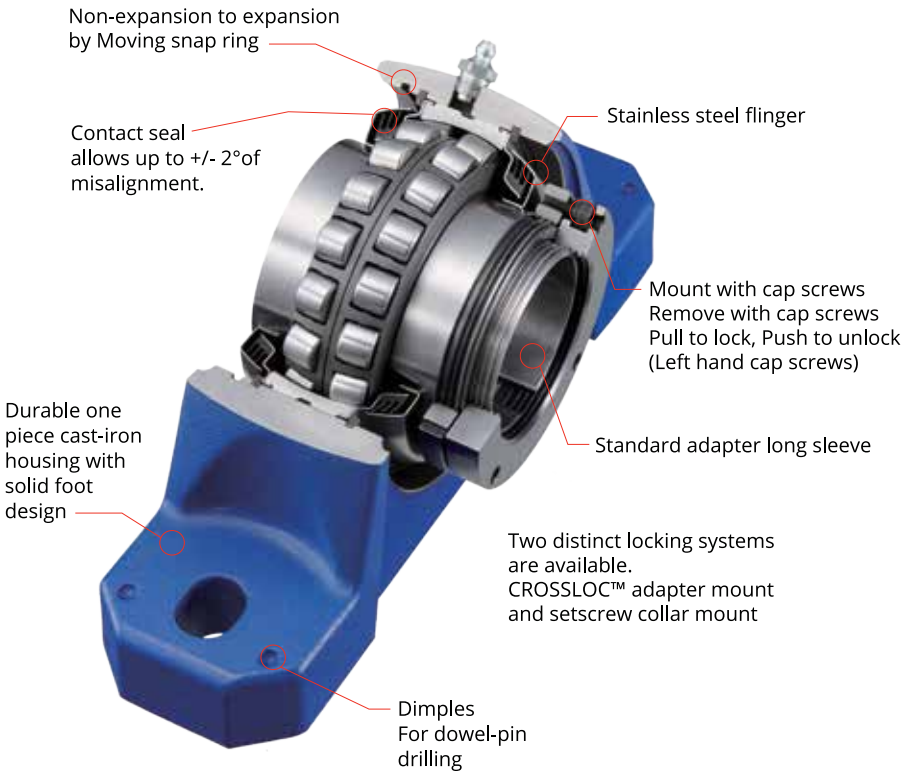
When I left FYH in 2018, I remembered my suspended Cross Ocean Inc. company. However, I wanted to continue to innovate bearing units rather than surfboard bags. I thought Cross Ocean Inc. doesn't sound like the name of a bearing company, and I changed the company name to COC Inc. I still wanted to keep my sea turtle logo from Cross Ocean which referred to the strong board bags, similar as the sea turtles crossing oceans to surf the waves around the world. I felt same way for my bearings. I want our bearings from Japan last long life like sea turtles and cross the oceans for the customers in the world. So I thought this logo was also perfect for my new bearing company. COC logo with flipped C inside turtle represents connecting people around the world.

Thankfully I have many connections to factories in China and they offered to help my project and allow COC to be a fabless company. They are high quality companies and I can see a big difference in quality from 20 years ago. I founded COC in September 2018 and we shipped our first order in October 2019, which was amazingly quick. It took only a year to figure out our design, produce samples, undergo extensive testing and figure out packaging. I appreciate all their passion for our products.

Eiichi Kobayashi,
CEO/Founder of COC INC.

So, what were the projects you couldn't finish at FYH?

There were two main projects I could not finish. The first was the spherical roller bearing units. I wanted to change the classic two-piece plummer block units to an one piece unitized unit. I invented the unitized SRB units with Z Lock at FYH but they were not compatible enough with SN plummer block units. Another project was stainless ball bearing units for the food market. I had redesigned that series at FYH but they were not near completion when I left.



> "Adapters require feeler gauges to check the clearance inside the bearings, so I invented CROSSLOC™ locking system for our SRB units."

What do you concern most to design the bearing units?

I have been working on the sealing and locking for mounted bearing units for many years. Contamination and installation are main reasons the L10 life of bearing are reduced. Increasing the number of seal lips could make for better protection, but the torque during rotation gets higher at the same time. The higher torque makes the temperature inside the bearings higher, and the air pressure inside of the bearing gets lower and if any point is not properly sealed, the outside air finds its way into the inside of the bearing pulling in contaminants. I am always concerned about the designs of the seal lips to keep the torque lower while providing maximum protection. For spherical roller bearings, it is important that the seal lips keep the same pressure during shaft misalignments, otherwise the outside air can find its' way into the inside of the bearing easily.

How's about the installation?

I personally think that adapters are the best locking system. Adapters hold the shaft from 360° degrees concentrically through the length of the adapter sleeve. Adapters eliminate the vibrations and are good for high-speed applications as well. The only problem with adapters is they are difficult to install and uninstall. Adapters require feeler gauges to check the clearance inside the bearings, so I invented CROSSLOC™ locking system for our SRB units. CROSSLOC™ is so simple and easy that even a 10-year-old can install and uninstall the units. We use the standard adapter sleeve for this locking system and this is why our unitized SRB units are 100% compatible with standard SN plummer block units. Our competitors use a one size smaller insert for their unitized plummer blocks. Their adapter mount inserts are compatible with setscrew locking inserts. The standard 22200K inserts used in the SN plummer block are one size bigger than straight bore inserts to accommodate the adapter. Since the insert being used is smaller, the load rating of their units is less than the traditional SN plummer block.

So your CROSSLOC™ bearings are not compatible with setscrew lock inserts?

CROSSLOC™ CX inserts are not compatible. But we just added a new line called CROSSLOC™ CXC which is the cylindrical bore (setscrew straight bore insert) equivalent. We use our original thinner wall, lower angle tapered sleeve for CROSSLOC™ CXC to match with the bore sizes of our CS setscrew lock inserts.

> “We designed a new locking system called OCCLOC™.”

So is CROSSLOC™ available for all housing styles now?

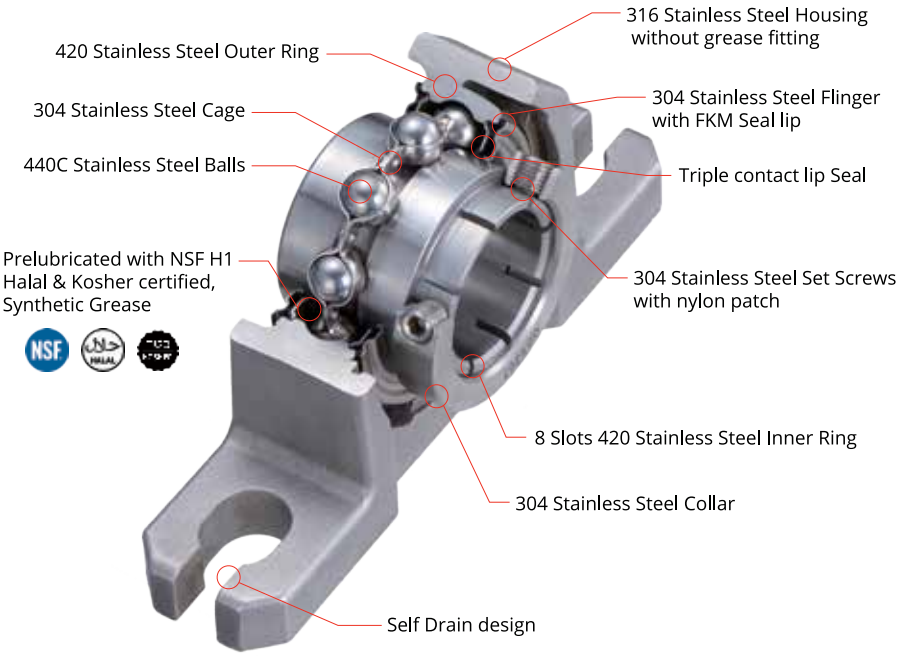
Yes, and the SAF plummer block version is available as well now. I love these new housings. All sizes of both CXC and SAF units will be available by this summer.

That’s great. Please tell us about your stainless-steel ball bearing units now.

Our stainless-steel series is called Saniline. I have been studying the solid polymer lubricant for food applications. However, it costs more and I’m not sure about the recycling of those materials. I designed a new seal and flinger to get the IP69K certification, which is the highest rating of the protection against the ingress of dust and water. Saniline inserts are lubricated for life and there is no grease fitting on the housings anymore. We don’t need to worry about people over greasing during maintenance like traditional stainless-steel units which can breed bacteria. We have added the stand-off housings to this lineup that is a half inch off from the mounting surface. The stand-off units are good for wash down clean-in-place applications to meet HACCP/HARPC requirements.

We designed a new locking system called OCCLOC™. This idea came from an old MB Centric-Lok design. I still have their ER insert somewhere in my bearing collection. The inner ring has 8 slots compared to Centric-Lok’s 4 slots. We have tested designs using from 2 slots to 8 slots to find the best holding power. Two setscrews are located 120°apart on the locking collar and the locking collar pulls the far side of inner ring during tightening of the setscrews. The solution is that the shaft can remain very clean without any damage from the bearings. The Skwezloc locking style uses a thicker collar for the cap screw to tighten properly. The OCCLOC™ can save the cost of the expensive stainless material by using a thinner collar.

We don’t use plastic materials at all to help protecting the environment. The plastic housings are a good cost savings for some applications, but when they get scratched, they can become entrapment points for bacteria. We also have a stainless-steel safety cover for these units. There is no machining for this cover on the housing. Just twist the cover to lock. It’s very easy to install and uninstall for cleaning. You can check our website crossocean.com for the details.



We see the QR code on your products. What information does it contain?

The QR code on the housing has the web link and serial number. You can scan it on site with your phone to get dimensions and torque setting values, installation videos and maintenance information for your scanned product size. You can use the serial number for the warranty and to trace the products. Each QR code is unique and there are no two same QR codes in the world. For CROSSLOC™ products, we have added the instruction on the collar directly by laser marking. CROSSLOC™ may be easy enough without the instructions, but we want to make sure that installing and uninstalling is simple for every user. The instructions are in English and you can scan the QR code for other languages.

How was your 2020? And what are your plans for 2021?

We announced COC for the first time in September 2019 and booked trade shows throughout 2020. We were excited to introduce our new brand around the world. COVID-19 destroyed all those plans quite quickly. The trade shows we were scheduled to attend were cancelled and we were on-hold with everything in 2020. This was very tough situation to start-up a company like ours. We spent all the year of 2020 for working very hard on our new products such as CROSSLOC™ CXC, SAF version, and Saniline. We focused on the safety and cleanliness of our products even more. We are keeping our fingers crossed until we are able to attend the trade shows in 2021.

COC Inc. is located at 1-7-4 Hamaderashowa Nishiku Sakai Osaka 582-8345 JAPAN, feel free to contact Tel: 072-267-2347 • e-mail: info@crossocean.com • web: crossocean.com for all your questions about this revolutionary mounted bearing units

How bearings are playing their part in new pump designs

By Mark Wakeham, Key Account Manager, and Mark Pritchard, Senior Sales and Applications Engineer, at The Barden Corporation

Semiconductors are an integral part of society and demand is raising thanks to the increasing use and consumption of consumer electronic devices coupled with the rapidly growing use of AI within industry. Furthermore, today's requirement for more renewable energy sources and therefore semiconductors for solar cells is contributing significantly to the industry's overall growth.

Manufacturing semiconductors requires an ultra-high vacuum environment lower than 10-7mbar to guarantee there is no risk of contamination and vacuum pumps are a critical piece of equipment to create the right atmosphere. A key component of the pump design is the bearing system. This article explores four key trends that are driving the design of new vacuum pumps and considerations for bearings.

There are typically two types of pump – Fore vacuum pumps, which take the pressure from atmosphere down to 10-3 mbar and then turbomolecular pumps (TMP) typically operate at ultra high vacuum levels down to 10-9 mbar. In this latter application the bearings are often required to work at high speed. However, regardless of the pump type there are some common challenges:

1. Energy efficiency

In a bid to reduce energy consumption and operate as efficiently as possible, pump manufacturers are looking at designing pumps with increased power density. However, parasitic losses which take energy from the system need to be taken in to consideration. Parasitic losses in a bearing system are mainly down to friction torque generated by the friction between the balls and the raceway and the lubrication in the bearing. They can be reduced by downsizing the bearing and reducing the number of balls, which also increases the speedability of the bearing, and thus the pump maybe able to run faster or more efficiently.

However, this poses a challenge because the loads on the bearing are the same but the ability of the bearing to support those loads is reduced. This can be overcome by looking at alternative materials with improved properties, namely fatigue strength and wear resistance – such as SV30®, a martensitic through-hardened, high nitrogen, corrosion-resistant steel.

2. Longevity

Reliability is the foundation for a long life time and minimal downtime. Using a combination of specialist materials, heat treatments and surface coatings, bearings can be designed that typically run for five years without failures in these harsh environments. Current "greased-for-life" bearing technology can consistently give 30,000+ hour life at high speeds in excess of 800,000 ndm.

Advanced coatings and surface treatments can be applied to bearings to combat friction, prevent corrosion and reduce wear. Heat treatment is especially important. At high temperatures retained austenite in a bearing steel negatively affects the dimensional stability of the bearing, causing it to expand, and this can lead to premature failure. Retained austentite in a bearing steel that is not heat treated is approximately 3 – 4 %, but with special heat treatment the level of retained austentite can be reduced to just 0.1%. This delivers better performance at high temperatures and ultimately a more reliable system with a longer life.

Another material that delivers superior reliable long life performance is ceramic (silicon nitride) balls, thanks to the material's inherent mechanical properties. Use of ceramic balls in place of steel balls can radically improve bearing

—Image 1: Bespoke bearings can now be delivered in a little as 20 weeks, enabling pumps to be introduced more quickly.

performance in several ways. Because ceramic balls are 60% lighter than steel balls, and because their surface finish is almost perfectly smooth, they exhibit vibration levels two to seven times lower than conventional steel

— Image 2: There are four key trends driving the design of new vacuum pumps: energy efficiency, longevity, speed to market and support.

— Image 3: Specialist precision bearings means pumps can operate to their maximum performance levels and over many years

ball bearings. Ceramic hybrid bearings also run at significantly lower operating temperatures, allowing running speeds to increase by as much as 40% to 50%. Lower operating temperatures help extend lubricant life. Bearings with ceramic balls have been proven to last up to five times longer than conventional steel ball bearings. Systems equipped with ceramic hybrids show higher rigidity and higher natural frequency making them less sensitive to vibration.

Bearing precision also plays a big part in efficiency and reliability and there is a direct relationship between precision class and bearing life. Bearings with the highest tolerances offer the highest precision levels and a longer life. Pump manufacturers should look out for bearings classified as at least ISO P4S (ABEC 7) as standard to ensure they deliver the best performance.

3. Speed to market

Manufacturers are under pressure to design and bring their pumps to market as quickly as possible in order to remain competitive and at the forefront of their market. One way to ensure that the process runs swiftly is to review the length of time taken for bearings to be designed.

The industry standard lead time for specialist precision bearings is between 40 – 60 weeks. However, this time has been drastically cut in half and bespoke bearings can now be delivered in a little as 20 weeks, enabling pumps to be introduced more quickly. What's more, this time is expected to be reduced even further, to just 15 weeks for tailored solutions.

— Image 4: Precision bearings contribute to an overall reduction in the total system costs.

4. Partnership and support

Pump manufacturers are increasingly requiring more than just a product. They are ever more in need of a partnership with their suppliers. Pumping systems are complex with many parameters and true partners for the bearing element can deliver full support in calculating and modelling the system. For example, once a bearing enters the qualification stage and tested it can be returned to the supplier for examination and running evidence of its performance. Leaving the modelling to bearing experts also frees up time for the pump designers to focus on their strengths and day-to-day tasks.

Conclusion

With increased demands for semiconductors and the current economic climate there are various requirements on pumps namely increasing efficiency and ensuring reliability. Selecting specialist bearings with a longer service life compared to conventional bearings means pumps such as dry pumps and TMP pumps can operate to their maximum performance levels and over many years.

Precision bearings also contribute to an overall reduction in the total system costs. When calculating the indirect costs of frequent bearing replacement — which include not just inventory, but machine down time, lost productivity and labour — the cost savings potential become significant.

Working with bearing experts that can design bearings with the right geometries to deliver the best performance and speeds for the environmental conditions, as well as deliver quickly can make all the difference to a manufacturer's productivity and profitability. Seeking out partners that combine heritage and knowledge with a flexible approach such as that offered by The Barden Corporation and its partnership with HQW Precision means pumps can keep running at the right pressure levels time and time again without fail.

For more information visit www.bardenbearings.co.uk or www.hqw.gmbh

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High precision bearings for machine tool application are heavily used in the Asian market, which is now the main producer of machine tool in the world. We are talking mainly about China, Taiwan, Japan and Korea. The approach to products in these market is different from Europe or USA. The product must not only be perfect from a functional point of view, but it also must look perfect since any minimal visual imperfection would reflect into a non-perfect product from manufacturing point of view. Such perspective is the starting point of our story.

An international super precision bearing maker based in Europe delivers its cylindrical roller bearings to OEM's in Asia. The rings from Prosino were perfect, their performance was outstanding but ... the customer noticed that the bearing grease tends to change colour after few weeks from the start of the life of the bearing in the application.

— Cylindrical Roller Bearings Rings

After long investigations the customer arrived at the conclusions that some contamination particles that were present on the undercut grooves of the inner rings were collected after heat treatment and subsequently combined with the bearing grease, changing its colour.

Unfortunately, all the trials conducted at the customer site to clean the rings before or after the grinding process did not bring to any significant results. Prosino had to face the issue from another point of view: the undercut grooves need to be mechanically cleaned with a dedicated process. After many trials, the conclusion was that micro glass particles could allow to reach the desired level of cleanliness.

A dedicated machine was built, and the result was astonishing. The rings were perfectly clean and the grease that the customer put in the bearings did not change anymore of colour, with a perfect satisfaction of the final customer.

This is an example how our company collaborates with its customer in order to build a win-win relationship.

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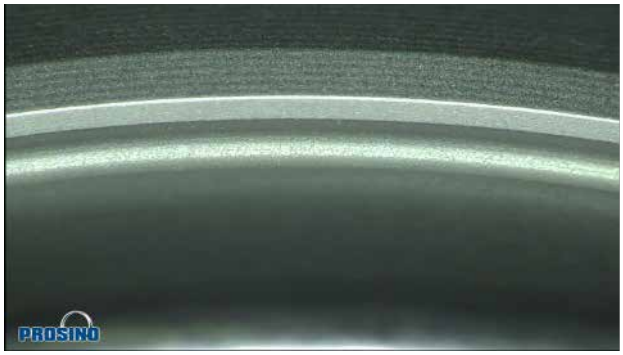

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Embossed VCI Tape Grips Around Bearings **To Prevent Metal Corrosion, Damage**

ALSIP, IL (October, 2020) --
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Embossed VCI poly film is the newest corrosion inhibitor product from Daubert Cromwell, the leading manufacturer of corrosion inhibitor packaging for metals. It is formulated with Premium Metal-Guard® VCI, a multi-metal corrosion inhibitor proven to protect steel, cast iron, galvanized, nickel, tinplate, and more.

Film is recyclable, non-toxic, safe for use in the workplace. It is ideal for wrapping bearings and other components when high strength, stretch and corrosion protection are needed. Use in automatic packaging machines to dramatically increase speed of production output.

VCI embossed bearing tape can also be used as a final wrap to hold layers of rust inhibiting materials next to the part during long-term storage.

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For complete information about embossed bearing wrap and all of Daubert Cromwell's VCI packaging products, call +1-708-293-7750; info@daubertcromwell.com.

About Daubert Cromwell

Since the 1940's, Daubert Cromwell has set the standard for corrosion preventive packaging in industry.Its VCI films, papers, liquids,emitters and specialty products are used worldwide to protect metal and metal parts in automotive, electronics, military, aerospace, heavy equipment and energy industries.

For more information or to view the company's range of VCI products, call 800-535-3535 or visit www.daubertcromwell.com.

Bearing Lubrication Reimagined: Remote and Real Time Friction Monitoring and Lubrication

What if we could lubricate our bearings remotely, from any device, making sure that the right amount and right lubricant are always used – and even better, based on bearing condition? Then we would address the 3 main lubrication issues, which cause most of early bearing failures. Today, this is already possible. Using ultrasonic sensors and single point lubrication devices, all connected to a central system, we can now bring lubrication practices to a whole new level!

Prevention in place of monitoring

We have a serious problem with bearing condition monitoring! Technology is making it easier and more cost-effective to monitor our bearings in real-time and as a result, we are seeing sensors and systems being installed on equipment at an exponential rate.

There is a race from these monitoring systems to detect the onset of failure (Point P on the P-F curve) at the earliest possible point. And this race to detect a failure is a serious problem. We are spending more money and extra TIME to detect a failure when we should be preventing that failure in the first place.

Addressing lubrication issues – the root of most bearing failures

It is no secret that over 80% of premature bearings failures can be traced back to lubrication related issues. These issues can be put into three general categories: inadequate lubrication (over or under lubricated), wrong lubricant, and contamination. When it comes to addressing premature bearing failure, reducing the impact on just one of these issues can have a large impact on the bearing life. But when we start to address all three, then we can reach excellence in our lubrication programs.

It's all about the friction levels

A lot of expertise needs to be designed into the bearing selection and lubrication requirements, no technology will likely ever replace the need for trained and experienced lubrication experts. But when it boils down to it, it is all about friction - that's why they are called anti-friction bearings.

Once the correct bearing is installed properly and the right lubricant is chosen, it comes down to managing that friction in the bearing by using the correct regreasing volume and frequency. Simple to understand but often difficult to put into practice.

Time based lubrication vs condition-based: using ultrasound to avoid under and over-lubrication

One technique is to use time-based lubrication. In this case, regreasing is done based on time, with a predetermined amount of grease. This method is often based on an ideal calculation that is not reflective of the real-life condition that influences the friction in the bearing. This often leads to under greasing or over greasing the bearing.

A step-change in lubrication practices came with condition-based lubrication. Using ultrasound to measure the friction in real-time to determine exactly when lubrication (and how much) is required to bring the friction back to or near the ideal level. Moving to ultrasound-assisted lubrication will ensure we do not over or under lubricate but has still not addressed the two other lubrication related issues: using the correct lubricant, and contamination.

What about automatic lubricators?

To address these two other lubrication issues many have turned to automatic

lubrication devices or auto lubers. Automatic lubrication provides a safer and more convenient method of supplying the precise amount of lubricant into the bearings on a more frequent basis.

These devices ensure we always use the correct grease stored in the device but also reduce or eliminate the possibility of contamination caused by the operational environment. These devices are time-based and set to dispense lubricant on a set frequency or run time.

The auto lubricant devices have evolved to become smarter. Many of them not only dispense the lubricant but can also set alarms based on excessive feedback and low lubricant.

The best of two worlds: SmartLube – single point lubricator, remotely operated, based on friction levels

We have two solutions addressing the different aspects of the common lubrication issues. On one side we have ultrasound-assisted lubrication, using friction to determine when and how much lubrication is required. Combined with good lubrication practices, it will provide benefits but still requires an investment in time and training to ensure the proper lubricant is used to reduce the potential of contamination.

On the other side, we have automatic lubrication devices ensuring the correct, contaminant-free lubricant but still based on time or running hours versus the condition or friction in the bearing, often still leading to not optimizing lubrication frequency.

What if we were able to combine the proven precision and best practice of condition-based lubrication using ultrasound with the convenience, safety, and accuracy of automatic lubrication devices? We would then have a solution that allows us to lubricate our bearings only when required by measuring friction and ensuring we always use the correct, contaminant-free lubricant every time. That's exactly what the SmartLube from UE Systems does.

Lubricate based on friction, from any device, anywhere

When we use technology to make all this remotely operated, we can now monitor the real-time friction of our bearings and, when needed, remotely dispense the correct lubricant. All this with the confidence that the lubricant is getting to the bearing with real-time alerts and notifications from any internet-connected device, anywhere in the world!

The OnTrak SmartLube by UE Systems has the power of real-time bearing friction monitoring and the convenience, safety, and accuracy of single-point bearing lubricators. Lubrication experts can now lubricate remotely with confidence from anywhere, anytime, on any device.

How does it work?

This disruptive device works with a simple concept: ultrasonic sensors are permanently mounted on the bearings to monitor friction levels. All this data is sent to a central processing unit – the OnTrak – and can be viewed in dashboards using any internet-connected device. The OnTrak then is also connected to single point lubrication devices. Based on the friction levels and on setup alarms, we now have the possibility to tell the OnTrak that a certain bearing needs lubricant. The OnTrak will then instruct the SmartLube – single point lubricator – to dispense lubricant, just the right amount. And the best part: all can be done remotely, anywhere, anytime.

The Machine Vision Company

Accelerating Industry 4.0 in The Bearing Industry

Hangzhou DeepVision Technology Co., Ltd. (hereafter shorted as DeepVision), is a high technology company able to integrate various frontier technologies including machine vision, computer image processing, artificial intelligence and so on.

The company can independently develop intelligent CCD and AI camera, research into image acquisition based on FPGA platform, manufacture automated equipment, and provide software and hardware for image pre-processing and feature identification.

Since the establishment of the company, DeepVision has provided Turnkey machine vision solutions and inspection equipment to world leading bearing manufacturers, such as NSK, Schaeffler and Nachi, helping them to improve defect visual inspection, improve product quality and reduce labor cost. With many success stories, the company has been recognized by the customers and investors as a revolutionary company actively driving the advancement of the AI automatic visual inspection in global industrial sectors.

On 10 September 2018, Qualcomm and Sequoia China invested 500,000 USD in DeepVision. On 12 October 2020, DeepVision announced that it had acquired Pre-A round financing of nearly 50 million RMB led by Vertex Ventures and followed by Qualcomm.

Why can DeepVision quickly draw great attention from these world-famous investment companies? Why can DeepVision support the leading bearing companies to resolve the challenging issues which many others cannot? What are their competitive advantages and what are the true values they can bring to the Customers? What is DeepVision's company vision and where is the company heading to in the coming years? With this series of questions, Bearing News interviewed the founder, Mr. Shuailin Wang to unveil the success stories behind.

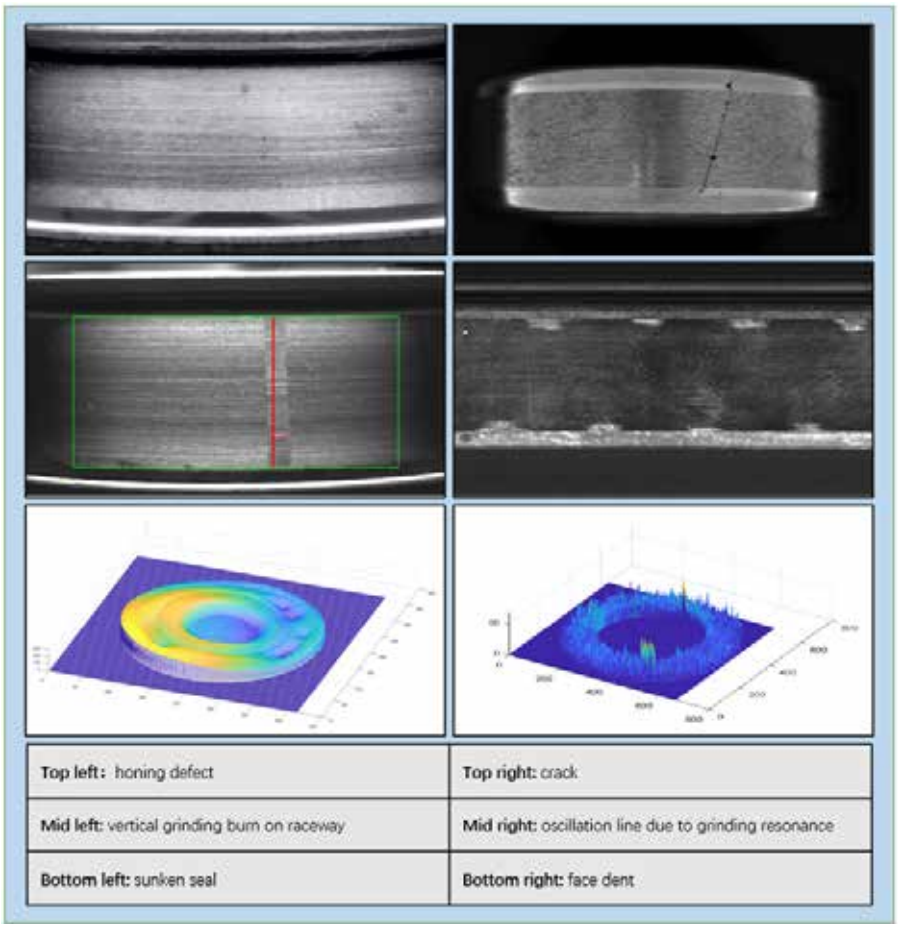
Shuailin Wang
Founder at Hangzhou DeepVision Technology

Can you please briefly introduce the history and evolution of DeepVision?

Hangzhou DeepVision was registered a few years ago. But before that, our sister company Beijing DeepVision had already run a big number of projects with bearing and bearing component companies, who were seeking machine vision solutions on automatic defect visual inspection. After successfully conquering a series of challenges and difficulties together with these customers in the bearing field, we became assured that we can work to satisfy various kinds of challenging machine vision requirements from customers in bearing industry. With such confidence and also the strong belief that there exists huge demand of machine vision solutions from the sectors of bearing and automotive components in the coming years, we came to the decision to establish a new company in Hangzhou sitting closer to the Customers and be very much focused on these industrial sectors mentioned,

Till now, we have succeeded in developing various kinds of solutions targeting high precision and high-speed automatic vision inspection. We have now more than 50 customers operating in the sectors of bearings, automotive components, aerospace components, new sources of energy, textile and 3C electronics and so on. So far, we have already signed and executed contracts with many leading players in various sectors.

In the field of the bearing industry, we are providing machine vision solutions to detect various kinds of defects on finished bearings, rings, rollers, shields and so on. NSK, Schaeffler, Nachi and large Chinese bearing companies in China have already purchased equipment and services from us. Furthermore, the commercial and technical discussions are ongoing with other leading bearing companies, such as SKF, Timken and Koyo.



What are the products and solutions DeepVision can provide to the bearing industry?

For bearing industry, our mature solutions include but not limited to:

- BC series intelligent surface visual inspection machines for finished bearings
- BTO/BTI series intelligent surface visual inspection machines for bearing rings
- BG series intelligent surface visual inspection machines for rollers
- RR series intelligent surface visual inspection machines for rocker arm bearings
- CV series modular visual inspection machines for single station

In addition, we are in the process of developing BN series intelligent surface visual inspection machines for bearing needles. We are scheduling to launch BN series products to the market within 6 – 12 months.

Taking finished bearing as an example, the types of defects we can inspect are grinding burns, dents, scratches, rusty spots, cracks, turning marks, sunken shields, missing/extra/

overlapped characters, and dark spots between characters and so on.

Currently, most visual inspection solution companies in bearing and automotive components sectors are automation integration companies. Unfortunately, among them, there are very few companies specialized in R&D on visual inspection technology. This situation gives the great opportunity to DeepVision, who can utilize its know-how and expertise to fill in the gap.

Our technology roadmap has essential distinction from most others' - DeepVision has R&D capability with a full technology chain that covers:

- Smart camera development and design;
- Edge computing;
- Image algorithm;
- Design of light field and light path;
- AI algorithm;
- Design of automatic equipment;
- Also some other core technical competences.

All of these enable us to achieve higher inspection efficiency and higher one-time pass rate, and consequently lower false detection rate and lower miss-detection rate.

Our competitive advantages are also reflected on a completely new technological structure, which is applying

DeepVision's superior advantages – automatic visual defect inspection

Technology DEEPVISION

In general

- Much higher computing power (distributed computing at camera + FPGA parallel computing)
- 12-bit camera catching much more image details (human eye = 8 bit)
- Characters: right or wrong and if broken or not (competitors check only there are characters or not, or how many characters)
- Qualified rate reaching around 98%
- Precision able to reach micron level
- Can do line change-over by simply clicking on one button

Bearings	Rollers	Ground/Honed Rings
• Sunken seals • Sunken shields	• Soft rollers • Frequent line change-overs	• Vibration waviness or chatter marks • Various types of Honing marks/defects • Bulging line due to damaged grinding wheel • Stop of workpiece rotation during grinding

distributed computing with partial computation situating at the camera. This replaces the traditional model of centralized data processing done by centralized industrial PC. As a result, DeepVision can achieve higher precision, higher speed and higher accuracy.

While many other labs are conducting theoretical research, DeepVision has achieved defect coverage rate of above 99%, and qualified rate of about 98%, thanks to repetitive experiments and verifications on the front lines together with the bearing and bearing component companies. In addition, our measurement precision has reached micron level.

With these technological advancements you have achieved, what values can DeepVision contribute to the customers in the bearing industry?

Mainly in the following four areas:

- Improve the quality of the bearing products leaving the manufacturing sites, reduce the number of customer complaints, improve the end customers' satisfaction, improve the image of the bearing and bearing component companies, and help DeepVision's customers to win more orders and gain more market shares.
- Reduce the cost of inspection. Each visual inspection machine can replace at least 3-5 online inspectors, and customers can recover the investment on each machine within 1-3 years.
- The bearing and bearing component companies are in better position to control, trace and feedback the data in the manufacturing processes. With this upgraded visual data collection, the Customer can practically realize the true online diagnosis and online feedback. It is indeed a breakthrough in terms of product quality statistic control on each production batch.
- Certainly, also ease the challenges of labor shortage most companies in China are generally facing today.

How will DeepVision develop further towards the customer market in bearing industry?

Our DeepVision's development planning has been based on:

- The environment and the trend of the speedy development of AI and digitalization in the world and the worsening labor shortages in China's manufacturing industries.
- The growing domestic and global market demand on machine vision solutions.
- The judgement of our strengths and weaknesses from comprehensive, deep and detailed analysis and benchmarking with all major players in the same field.

While we are growing the company and our research, sales and manufacturing teams, we are benchmarking with the most well-known machine vision companies in the world, and continuously taking actions

to improve and strengthen our company's management system, quality system and supply chain management system.

We foresee our sale volume will be doubled year on year over the next few years. The growth will come not only from the bearing and bearing component companies in China, but also those in the international market. Therefore, we are already in proactive contact with leading bearing companies outside China. And it is indeed our great pleasure to receive the interview from Bearing News, so that more global customers will get to know much more about us. We look forward to receiving business and technical inquiries from them, and we are eager to grow business together with them and help them to solve practical issues at their manufacturing locations.

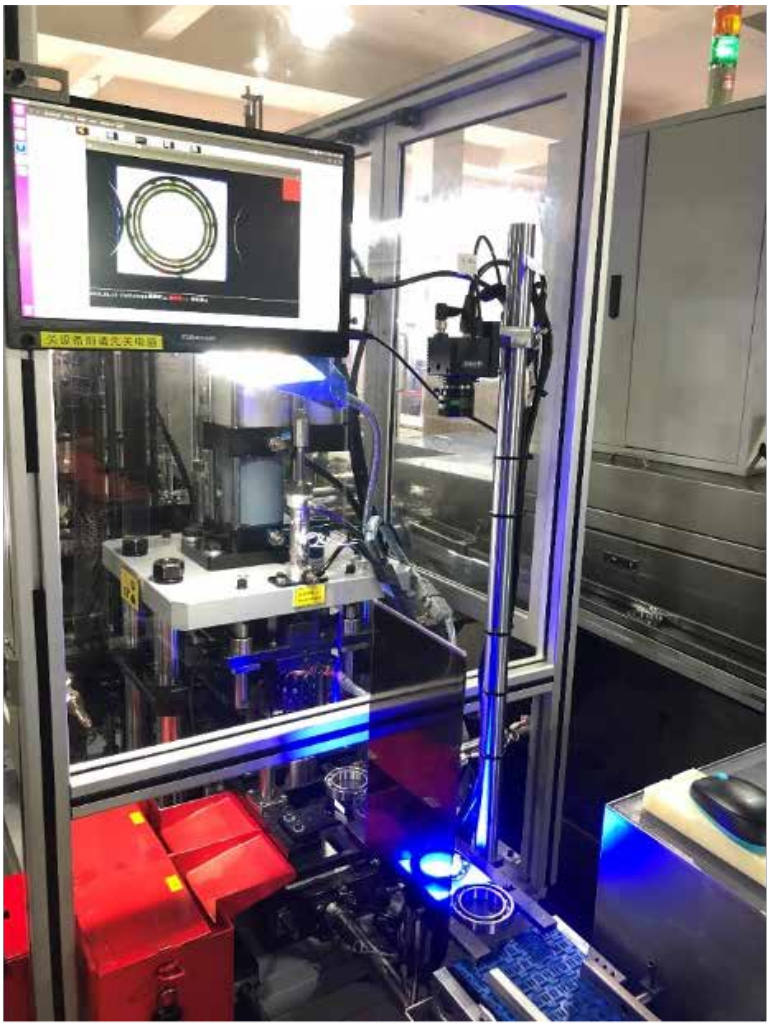
Now, we are extremely busy in deliveries. For meeting the foreseen growing demand, we must speed up the development of manufacturing capacity. The growing capacity shall partly come from our mature and high-performing equipment suppliers, and partly from expanding our in-house capacity by constructing a new manufacturing site in Hangzhou, which is under preparation and scheduled to start production in 2021. Combining all the existing and new capacities, we should be able to have enough capacity to catch up with the fast demand increase in the coming years.

In the area of R&D, we have now an extraordinarily strong R&D team with independent research and development capability, and we have the most advanced core technologies domestically and globally. But we are keeping reminding ourselves that we should never be satisfied with what we have achieved today, but instead continue to innovate to keep our leading technological position in the market.

Our team believes DeepVision has a very bright and broad future in the global bearing industry. While seizing the business opportunities, developing new technologies and growing further and further, DeepVision team must apply management knowledge, skills, and tools to construct and maintain a healthy and robust management system, which should be the foundation for our growth ahead.

We highly appreciate this interview from Bearing News. And we look forward to hearing soon from more and more domestic and global bearing and bearing component customers!

Please visit our website on www.deepvision-tech.com or send inquiries to info@deepvision-tech.com



SCHAEFFLER

Ball Bearings

- Angular contact ball bearings
- Deep groove ball bearings
- Self aligning ball bearings
- Spindle bearings
- Thin section bearings

Roller Bearings

- Barrel roller bearings
- Cylindrical roller bearings
- Needle roller bearings
- Spherical roller bearings
- TORB toroidal roller bearings
- Tapered roller bearings

Other Rolling Bearings

- Bearings for screw drives
- Crossed roller bearings
- Rotary table bearings
- Slewing rings
- Track rollers, back up rollers and cam rollers

WWW.GODIVA-BEARINGS.CO.UK

Dudley: +44 (0) 1384 240 005
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Newcastle: +44 (0) 191 272 5225
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— Brave Test Rig-300

A BRAVE new world *for bearings*

An experimental verification facility that will provide unprecedented insights into the mechanisms behind bearing failures and performance prediction is being built by SKF.

Some ten billion bearings are manufactured each year and, given the harsh conditions to which they are often subjected, they are incredibly reliable. Indeed, approximately 90% of these bearings outlive the equipment to which they are fitted. Only 0.5% of bearings fail in service, but this still means that some 50 million are replaced due to damage or failure every year, and each of these failures will likely have financial implications for their operators in terms of lost production, damage to adjacent parts and the cost of repairs.

There are numerous reasons why bearings can damage or fail. Generally speaking, around one third fail due to fatigue, while another third fail due to issues with lubrication. Contamination causes a sixth of bearing failures, while the balance is accounted for by other factors, such as improper handling and mounting, heavier or different loading than was anticipated, and poor fitting.

When attempting to predict how, and perhaps more importantly when, a bearing will fail, a huge number of variables must be taken into account, including the application for which it will be used, the environment in which it will operate, the lubricants used and the loads to which it will be subjected, to name but a few. As such, when developing new bearings, verifying their performance and for how long they will last can be a slow, expensive and complex process.

SKF is looking to solve this problem at its Research and Technology Development (RTD) centre in Houten, The Netherlands. The company has started work on the construction of an experimental verification facility there that it will use to increase its knowledge of the mechanisms that cause bearings to fail. It will also use the facility, which will

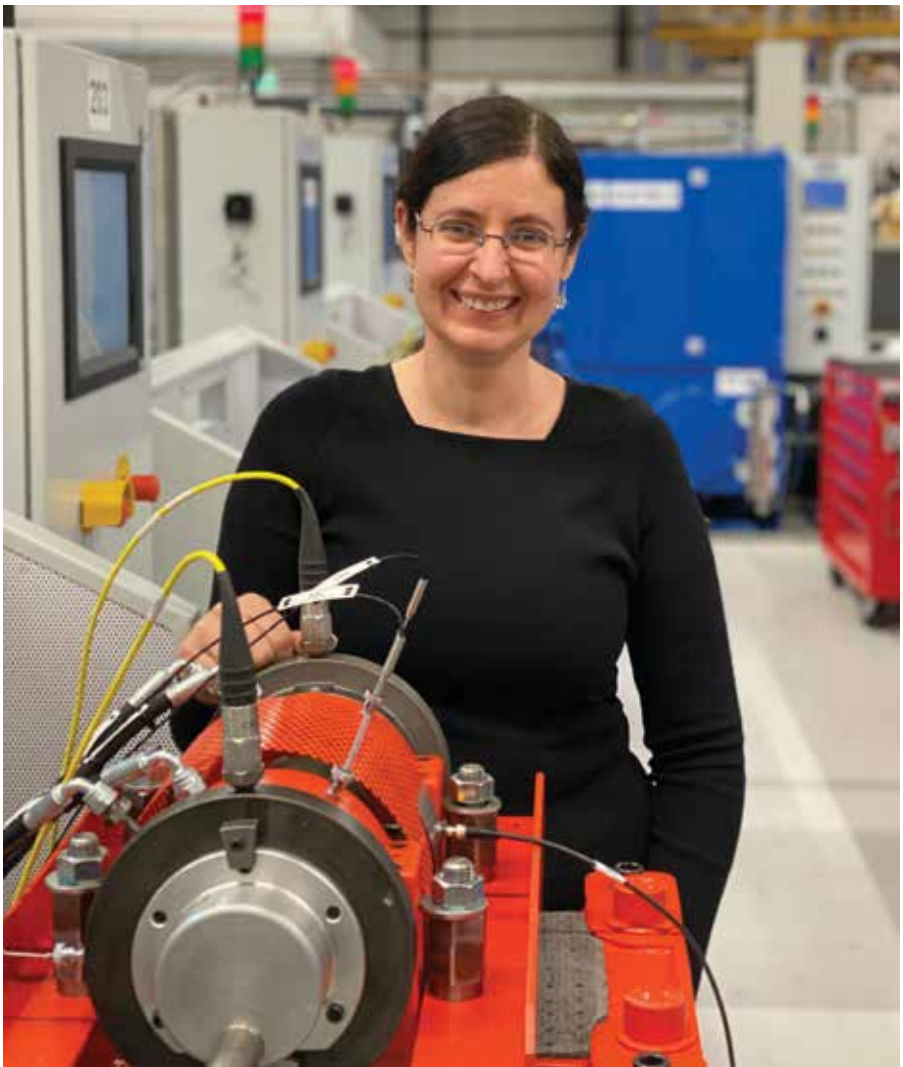
be called Bearing Rigs for Accelerated Verification Experiments (BRAVE), to develop ways to predict the remaining useful life of these critical components rapidly, accurately and repeatably.

Team Leader for Bearing Steels, Urszula Sachadel, and Edwin Tummers, Team Leader for Experimental Verification at SKF have been running this project. "We needed a flexible testing facility where we could simulate different application conditions and see how a bearing system, including the materials from which it is made, and the lubrication employed, performs when operating under different loads and at different speeds. We also needed to be able to do that in a way that allows us to perform investigations on that system, so we can determine how defects are generated, how they progress and how long the bearing will last until maintenance is required," says Tummers.

When completed, BRAVE will feature a number of rigs specifically designed and tailored to meet SKF specifications will be used by researchers to develop and experimentally verify bearing failure models. The functions of these rigs will be categorised as 'contaminate', 'initiate' and 'propagate', and they will be often used in sequence. Sachadel explains: "With the contaminate set-up, for example, we can generate defects, such as dents, abrasion, electrical damage and corrosive damage in the bearings in different ways. We can also apply different lubricants. In the initiate set-up, we can then run the bearings under certain conditions to create some initial damage to them. Finally, in propagate, we can determine how different load and speed conditions influence the rate at which this damage spreads". Each set-up type can also be used in isolation, or in a 'mix-and-match' approach, enabling a wide range of tests to be performed. In this way, Sachadel says, SKF researchers can screen many different variants of bearings very quickly to determine the best solution for a given application. Test procedures will be developed, controlled and monitored closely, and all of the data, regarding things such as vibration, temperature and load history will be recorded. This data can then be analysed in detail during or after the experiments.

— *Edwin Tummers*

— *Urszula Sachadel*



Sachadel continues: "Using BRAVE, we will be able to quickly evaluate potential bearing solutions, screen them, and understand the impact of different manufacturing processes on their performance. Further, in the future, we can use the data we gather to support our development of artificial intelligence and machine learning techniques to predict or improve the performance of our bearings."

BRAVE will be of particular benefit to SKF's Rotating Equipment Performance (REP) business and its remanufacturing operations. Sachadel explains: "We plan to look at the bearings after different stages of remanufacturing, to determine how the process affects their performance and how to boost it."

Work on the facility is currently scheduled for completion in early 2021. Sachadel concludes: "We're going to learn a lot of new things through BRAVE, which we look forward to sharing with our customers."

For further information, please contact
Nia Kihlström, +46 31-3372897
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What is BEARING EXPO 2021 ?

3 days “Live” Online Exhibition, B2B Meetings and Conference with Bearing & Power Transmission Industry Peers

B2B Meetings

- Meet 1-on-1 by video or chat function
- Join B2B speed meeting sessions and meetings on invitation
- Digital exchange of contact details

Exhibition

- Live virtual booth for 3 days
- Online company profile on BEARING-EXPO.com
- Live video or chat function
- Digital exchange of contact details

“Ask The Expert“ panels

- Ask your questions to the Experts during "Expert Q&A" panels
- Visit live virtual exhibition
- Join Conference sessions

1500+
ATTENDEES

4000+
B2B MEETINGS

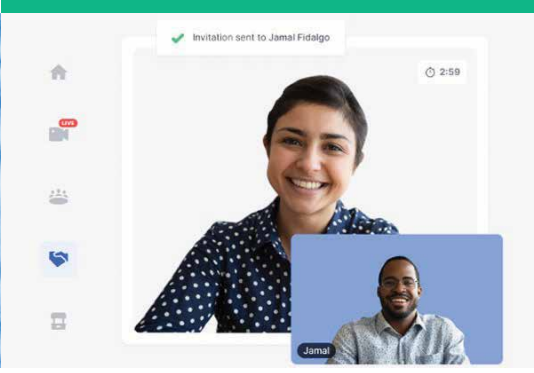
60+
COUNTRIES

50+
EXHIBITORS

18+
SPEAKERS

Conference

- 18+ speakers
- Sessions on economic recovery and future analysis
- Technical presentations and workshops



Speakers & Experts

Hagen Elgeti
Elgeti Engineering GmbH
Development of Bearing Suppliers and Quality Control during Purchasing

Juergen Lauer
Rohmann GmbH
Eddy Current Inspection on Bearing Rings and Rollers

Mark Roberts
OTB Solutions
How to design and deliver conversations in the Bearing Industry, that lead to revenue (virtually)?

Sebastiano Rizzo
Tsubaki Nakashima Co. Ltd.
Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control

Dave Hull
Precision Components
The Evolution and Future of the Global Bearing Industry

Markus Raabe
Mesys AG
"You need a Bearing Stiffness? Which one?" Remarks and Influence Factors for Stiffness of Shaft-Bearing Systems

Todd Snelgrove
Experts in Value
Bearing Distributors and Manufacturers working together to change the discussion with customers to “Value First Then Price”

Christoph Martin
Georg Martin GmbH
Bearing Clearance Compensation and Shimming Strategies

Haris Trobradovic
SDT Ultrasound Solutions
Lubrication is not an island: Ultrasound Guided Condition Based Lubrication

Vikas Manral
SolutionBuggy
Recovery of the Bearing Industry

Ian Knight
Enluse BV
The Lube Room is the Foundation of Bearing Reliability

Per Arnold Elgqvist Olsson
Tribologia
Bearing Reliability Assurance

Toon Van Grunderbeeck
Lubretec
Lubrication Reliability Fundamentals

Rich Wurzbach
MRG Laboratories
New techniques for grease sampling and analysis to enhance reliability and extend bearing and grease life

Pratap Kambley
Caravan Reliability Services
Case study on "How fretting corrosion can crack bearings in a wind application" and "The use of ultrasound for monitoring slow speed bearings"

David Beattie
DASH Engineering
Mining Industry Application for Bearings: Myths & Reality

Blair Fraser
UE Systems
Reimagine Bearing Lubrication with IIoT and Ultrasound

Alejandro Perez Martinez
Grupo MTF
Correlation between laser shaft alignment & Bearing Life: A Holistic point of view

Bearing EXPO Program 2021

	Time	Speaker Presentations & Expert Panels — Central European Time (Brussels)
15 March	10:00	**Haris Trobradovic** • Lubrication is not an island: Ultrasound Guided Condition Based Lubrication
	11:00	**Juergen Lauer** • Eddy Current Inspection on Bearing Rings and Rollers
	12:00-13:00	**Break**
	13:00	**Hagen Elgeti** • Development of Bearing Suppliers and Quality Control during Purchasing
	14:00	**Christoph Martin** • Bearing Clearance Compensation and Shimming Strategies
	15:00	**Ian Knight** • The Lube Room is the Foundation of Bearing Reliability
	16:00	**Dave Hull** • The Evolution and Future of the Global Bearing Industry
	17:00	**Mark Roberts** • How to design and deliver conversations in the Bearing Industry, that lead to revenue (virtually)?
	18:00 -19:00	**Break**
	19:00	**Rich Wurzbach** • New techniques for grease sampling and analysis to enhance reliability and extend bearing and grease life
	20:00	**Blair Fraser** • Reimagine Bearing Lubrication with IIoT and Ultrasound
	21:00	**Alejandro Perez Martinez** • Correlation between laser shaft alignment & Bearing Life: A Holistic point of view
	22:00	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control
	23:00	**Markus Raabe** • "You need a Bearing Stiffness? Which one?" Remarks and Influence Factors for Stiffness of Shaft-Bearing Systems
16 March	05:30	**Pratap Kambley** • Case study on "How fretting corrosion can crack bearings in a wind application" and "The use of ultrasound for monitoring slow speed bearings"
	06:30	**David Beattie** • Mining Industry Application for Bearings: Myths & Reality
	07:30 -08:30	**Break**
	08:30	**Vikas Manral** • Recovery of the Bearing Industry
	10:00	**Markus Raabe** • "You need a Bearing Stiffness? Which one?" Remarks and Influence Factors for Stiffness of Shaft-Bearing Systems
	11:00	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control
	12:00 - 13:00	**Break**
	13:00	**Per Arnold Elgqvist** • Bearing Reliability Assurance
	14:00	**Toon Van Grunderbeeck** • Lubrication Reliability Fundamentals
	15:00	**Juergen Lauer** • Eddy Current Inspection on Bearing Rings and Rollers
	16:00	**Todd Snelgroeve** • Bearing Distributors and Manufacturers working together to change the discussion with customers to "Value First Then Price"
	17:00	**Hagen Elgeti** • Development of Bearing Suppliers and Quality Control during Purchasing
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	06:30	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control
	07:30	**Dave Hull** • The Evolution and Future of the Global Bearing Industry
	09:00	**End Of Event**

Bearing EXPO Program 2021

Speaker Presentations & Expert Panels

US Eastern Time (New York)

	Time	
15 March	04:00	**Haris Trobradovic** • Lubrication is not an island: Ultrasound Guided Condition Based Lubrication
	05:00	**Juergen Lauer** • Eddy Current Inspection on Bearing Rings and Rollers
	06:00- 07:00	**Break**
	07:00	**Hagen Elgeti** • Development of Bearing Suppliers and Quality Control during Purchasing
	08:00	**Christoph Martin** • Bearing Clearance Compensation and Shimming Strategies
	09:00	**Ian Knight** • The Lube Room is the Foundation of Bearing Reliability
	10:00	**Dave Hull** • The Evolution and Future of the Global Bearing Industry
	11:00	**Mark Roberts** • How to design and deliver conversations in the Bearing Industry, that lead to revenue (virtually)?
	12:00 -13:00	**Break**
	13:00	**Rich Wurzbach** • New techniques for grease sampling and analysis to enhance reliability and extend bearing and grease life
	14:00	**Blair Fraser** • Reimagine Bearing Lubrication with IIoT and Ultrasound
	15:00	**Alejandro Perez Martinez** • Correlation between laser shaft alignment & Bearing Life: A Holistic point of view
	16:00	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control
	17:00	**Markus Raabe** • "You need a Bearing Stiffness? Which one?" Remarks and Influence Factors for Stiffness of Shaft-Bearing Systems
	23:30	**Pratap Kambley** • Case study on "How fretting corrosion can crack bearings in a wind application" and "The use of ultrasound for monitoring slow speed bearings"
16 March	00:30	**David Beattie** • Mining Industry Application for Bearings: Myths & Reality
	01:30 - 02:30	**Break**
	02:30	**Vikas Manral** • Recovery of the Bearing Industry
	04:00	**Markus Raabe** • "You need a Bearing Stiffness? Which one?" Remarks and Influence Factors for Stiffness of Shaft-Bearing Systems
	05:00	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control
	06:00 - 07:00	**Break**
	07:00	**Per Arnold Elgqvist** • Bearing Reliability Assurance
	08:00	**Toon Van Grunderbeeck** • Lubrication Reliability Fundamentals
	09:00	**Juergen Lauer** • Eddy Current Inspection on Bearing Rings and Rollers
	10:00	**Todd Snelgroeve** • Bearing Distributors and Manufacturers working together to change the discussion with customers to "Value First Then Price"
	11:00	**Hagen Elgeti** • Development of Bearing Suppliers and Quality Control during Purchasing
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18 March	00:30	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control
	01:30	**Dave Hull** • The Evolution and Future of the Global Bearing Industry
	03.00	**End Of Event**

Bearing EXPO Program 2021

	Time	Speaker Presentations & Expert Panels	Asia Pacific Time (Mumbai)
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	19:30	**Ian Knight** • The Lube Room is the Foundation of Bearing Reliability	
	20:30	**Dave Hull** • The Evolution and Future of the Global Bearing Industry	
	21:30	**Mark Roberts** • How to design and deliver conversations in the Bearing Industry, that lead to revenue (virtually)?	
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	02:30	**Sebastiano Rizzo** • Modelling of Bearing Ball Lapping Machines for Vibration Monitoring and Quality Control	
	03:30	**Markus Raabe** • "You need a Bearing Stiffness? Which one?" Remarks and Influence Factors for Stiffness of Shaft-Bearing Systems	
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	12:00	**Dave Hull** • The Evolution and Future of the Global Bearing Industry	
	13:30	**End Of Event**	

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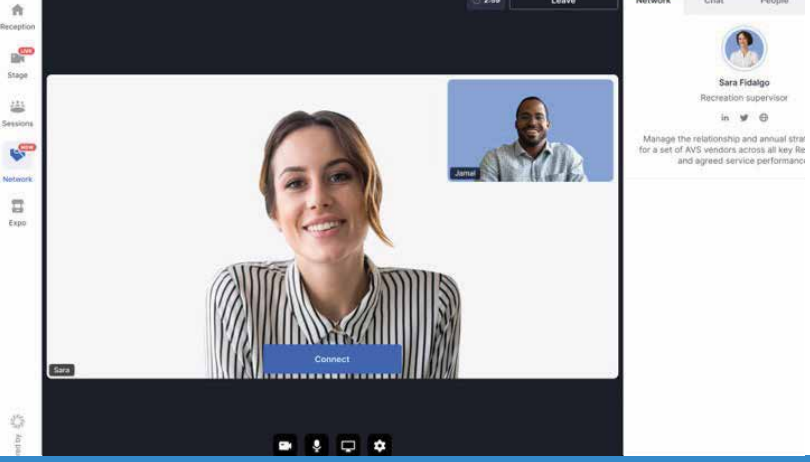

B2B MEETINGS

BEARING EXPO B2B MEETINGS are the great place to connect with potential leads, friends, and customers while you are all in the same digital platform. Normally sales leads have been lined up for in-person meetings months in advance. This will be changed and made more effective with our SPEED NETWORKING SESSIONS between distributors, manufacturers, solution providers and end-users.

Attendees are also able to select the peers and plan the 1-on-1 video meetings by invitations. Join today and create a memorable experience for your prospects with a well-planned out virtual meeting.

EXHIBITION

Catch the Moment. Do not let the pandemic thwart your event, product launch and exposure plans. Pivoting your in-person event into a virtual event is a great way to take advantage of the large digital possibilities that has been forming for years. Thankfully, all industries have become well versed in receiving online requests and managing their marketing.

Beside the 3 days virtual booth at the live digital BEARING EXPO event, exhibitor companies will automatically activate their online company profile at Bearing-Expo.com for 1 year, by participating as an exhibitor. Overall, look at this as an opportunity to expand your B2B organizations digital presence worldwide through the execution of top-tier virtual event.

Who Attends BEARING EXPO?

Exhibitors

- Bearing Manufacturers
- Power Transmission Companies
- Distributor Companies
- Lubrication Companies
- Equipment Manufacturers
- Bearing Production Machinery Companies
- Solution Providers
- Engineering Companies
- Associations and Service Organizations

Visitors & B2B Attendees

- Manufacturers
- Distributors
- Service Providers
- Mechanical Engineers
- Reliability Engineers
- Lubrication Engineers
- Maintenance Engineers
- Bearing & Power Transmission Professionals

Industries

- Bearing & Power Transmission
- Motion Control
- Maintenance
- Automation
- Automotive Components
- Asset Management
- Lubrication
- Reliability
- Other Industry Segments (Food & Beverages, Mining, Cement, Steel, Off-highway, Machine Tools and Construction)

Why Attend BEARING EXPO ?

TOP 10 REASONS TO ATTEND

1. Meet potential customers

Find new customers for your solutions and products

2. Increase your company visibility and branding

Promote your company, products and solutions with the exhibition and sponsorship opportunities

3. Expand your distributors network

Find new distributors and expand your sales network worldwide

4. Find new suppliers

Meet new potential suppliers and diversify your product and solutions portfolio

5. Stay up-to-date on new technologies

Get new ideas and insight information from International key note speakers

6. Gain market insights

Share ideas, knowledge and discuss industry related issues with professionals during the conference, B2B sessions and generate new ideas

7. Experience all facets of the live digital event

Get in touch with the manufacturing, distribution, lubrication, OEM, MRO peers from the bearing and power transmission industries for 3 days

8. Collect statistics and contact digitally

Exchange contact details digitally and keep record statistics and metrics for all booth visits and meetings

“BEARING EXPO covers every facet for the bearing manufacturer, distributor, solution providers and end-user in one single live digital event.”

9. Replay recorded conference presentations

Replay the recorded commercial and technical conference presentations and workshops

10. Connect to the largest bearing & power transmission network

Companies who join the event will automatically receive the print and online BearingNews and Motion&Drives magazine publications at their address. Companies who join the exhibition will automatically activate their online booth at www.bearing-expo.com for 1 year

Participation Options

VISITORS & B2B MEETINGS

- Schedule 1-on-1 video or chat meetings
- Join B2B speed Networking meeting sessions
- Collect digital contact details of new peers
- Visit Exhibition area
- Join “Ask The Expert” panel sessions
- Attend the conference and workshop presentations

BECOME A SPEAKER

- Bearing & Power Transmission industry market insights and road to recovery topics
- Technical presentations on bearings, lubrication, maintenance and related topics
- Manufacturing technologies and future outlook topics

Contact **info@bearing-expo.com** for more information.

Register Today!

www.bearing-expo.com/expo2021

EXHIBITORS

- Live virtual booth for 3 days
- Host visitors at your booth with live video and chat function
- Online booth for 1 year on BEARING-EXPO.com
- Digital exchange of contact details
- Schedule 1-on-1 video or chat meetings
- Join B2B speed Networking meeting sessions (5min.)
- Collect digital contact details of new peers
- Visit Exhibition area
- Join “Ask The Expert” panel sessions
- Attend the conference and workshop presentations

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.

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The Alternative Power

– remains proactive and optimistic with a realistic view

RKB Bearing Industries Group is a Swiss manufacturing organization that has been operating in the bearing industry since 1936. We are proud of our more than 80 years of active presence in the bearings industry and we are committed to developing further this valuable legacy. COVID-19 meant for RKB, as for all other important manufacturers, additional challenges generated by its direct and indirect effects. As far as the direct effect is concerned, RKB had to find and implement appropriate solutions for a severe decrease in the demand of all regions and industrial sectors. Equally important, we had to properly adjust our internal activity to the indirect effects of COVID-19 in terms of work safety and working procedures. The fact that RKB has its headquarters in Switzerland was also beneficial and the fast and helpful decisions of the Swiss government allowed us to keep on working. We are focused on development and innovation and we offer a diverse product portfolio covering most industries and ranging from small-scale size bearings to over 4 tons bearings. The fact that bearings are crucial components for a huge number of industrial applications represents a major opportunity, but also a challenge for RKB. Providing necessary products proved to be a solid basis for the continuity of our business even in adverse circumstances.

Essential industries have never stopped during these challenging times. Therefore, bearings continue to be needed. With this optimistic but also realistic view, we pro-actively tried to successfully face this year's negative market environment, mainly characterized by decreased demand and multiple uncertainties.

In answering the current challenges, RKB Management believes it was important that we never stopped identifying and implementing solid solutions regarding the full range of our activity, from design and production to clients' training and service. In a context when all clients are focused on cost optimization, it was also important that we continue to provide tangible competitive advantages for our customers. In this respect, we act so that our products and all the related activities we are performing deliver an attractive return on investment (ROI) and value for money to our customers.

To overcome all the difficulties generated by the new coronavirus pandemic, RKB adapted to the times and chose smart working. Our colleagues continued to be performance-focused and effective during this difficult period. They were amazing and showed a great team spirit. We used video calls all the time to keep in touch with everyone. In addition, we revised documents, increased our knowledge, always reading and learning, and organized online seminars.

The lessons of the past crises were valuable in dealing with the current one. For example, in the time of the steel industry crisis, we diversified our product range to reach other businesses. When the Euro Crisis arrived, we expanded our presence worldwide via partners and branches.

As a result, we now have a worldwide distribution network and exports to more than 50 countries. RKB sales force grew based on long-term partnerships and trust, mutual respect and interest in achieving each party's business objectives.

RKB business model considers warehouse availability and just in time service as a critical central resource for the ongoing organic growth of our company. The evaluation of RKB business performance during this year confirms the validity of this strategic option. RKB has one of the three largest stock of standard and technological rolling bearings in Europe, carefully supervised by an advanced software system - RKB Active Strategic Stock Management.

Our large and locally based warehouses solved many critical situations that our clients across the world were facing. They made possible RKB prompt reactions to many urgent clients' requests and confirmed our just-in-time delivery commitment.

Getting A Grip On Safety

Minimising The Safety Risks Posed by Exposure to Grease, Oil and Chemical Compounds

Contact with oil, grease and specialised lubricants is a daily occurrence for workers in many industries. The prevalence of these substances in a working environment creates safety issues that range from detrimental health implications through to productivity losses. For safety and operations managers aiming to minimise risk, today's available hand protection solutions incorporate advanced technologies that deliver suitable barrier protection and superior handling capability in both dry and oily industrial applications.

Dermal Exposure Concerns

Liquids and chemical compounds commonly found in (or generated by) industries such as oil and gas production, mining, assembly, stamping, metal-working and manufacturing are known to be harmful to humans. Equally, many occupations — such as machinery installation and maintenance workers — necessitate constant contact with lubricants and oils that are readily absorbed through the skin and can cause irritation or contamination.

The relative degree of harm varies according to the chemical composition of each specific substance, as well as the probability of direct contact or exposure. Possible undesirable outcomes of dermal exposure to liquids and oils varies widely, with conditions ranging from skin irritation and allergies (including contact dermatitis), through to more serious complaints in the case of known — or as yet unidentified — carcinogenic compounds. The link between dermal contact and presenting symptoms

> “The best defence against unwanted dermal contact is provision of suitable personal protective equipment (PPE).”

may not be immediately apparent and therefore initially go unrecognised. For example, exposure to oil — a combination of substances including powerful neurotoxins — can lead to nausea, euphoria, headache and dizziness. Each of these is an indication that the body’s nervous system is suffering damage, but the correlation between skin contact and these symptoms is not necessarily a logical link to the affected worker or safety staff.

As many of these potentially harmful materials are an inherent and unavoidable part of the industry sector in which they are found, or derived from required processes and actions, the best defence against unwanted dermal contact is provision of suitable personal protective equipment (PPE). To provide an adequate safeguard, hand protection solutions should incorporate advanced liquid repellence technology, such as a liquid impermeable nitrile coating that prevents oils and lubricants from even incidental contact with a worker’s skin. The liquid layer should be integrated into a knit glove design that allows the wearer flexibility and movement, while still providing full mechanical protection.

Grip Versus Slip

An equally problematic effect of incidental or sustained contact with liquids is compromised grip, which can easily lead to injury and decreased productivity.

Mechanical equipment — including engines, generators, dredges, pumps and gearboxes — usually requires regular lubrication to maintain functionality, but the presence of oils and degreasers makes maintenance tasks more difficult and can extend the time required to inspect, remove, replace and reassemble parts and machinery.

> “Compromised grip can easily lead to injury and decreased productivity.”

If the hand protection solution selected doesn’t provide adequate grip, objects can be easily dropped or mishandled, particularly when oils and lubricants are present. Grip also dictates how much force is needed to handle an item or tool, meaning that excessive force may be required for extended periods. This can quickly lead to hand and arm fatigue, productivity losses and the real possibility of developing musculoskeletal disorders in the long-term.

Advanced hand protection grip technology is now available in the form of a coating treatment that produces an irregular texture on the glove. The texture pushes oils and liquids away from the surface of an object on contact, relieving hand and arm strain caused by poor grip and improving dexterity, safety and productivity.

In situations where workers are exposed to oils, lubricants and other chemical compounds, a thorough risk assessment process should cover the full gamut of unwanted potential outcomes —from direct dermal exposure through to the ill effects of compromised grip and handling.

Understanding the full picture will better enable safety and operations managers to make an informed PPE selection that best meets the specific needs of an application. Check ansell.com for more information.

PTFE thrust bearing conversion improves operations at hydropower station

Michell Bearings has completed a PTFE conversion of white metal thrust pads at a hydroelectric power plant in Tennessee.

Constructed in the mid-1930s, the Norris Dam was the first major project for the Tennessee Valley Authority (TVA). :Its purpose was to bring economic development to the region and control the flooding that had long plagued the Valley.

TVA worked with Michell Bearings after experiencing numerous thrust bearing failures over the life of one of the two generator units. The failures of the original white metal bearings resulted in excessive downtime and associated loss of revenue.

Michell Bearings was awarded a design contract to investigate the potential problems with the 1930's design, which had been subject to various attempts over the years to improve reliability. The engineers at Michell Bearings created a 3D model of the thrust bearing support structure and performed a finite element analysis to determine any issues affecting the bearing's performance.

Michell Bearings' in-house performance prediction software was used to evaluate the performance of the existing white metal pads.

The bearing's thrust pads were replaced using a PTFE lined alternative as a result of the study. The PTFE material provides a greater safety factor when compared with the white metal solution. PTFE is more durable and has a well-established and proven track record within the hydro power sector. The study concluded that the material will also increase the life of the bearing and provide greater reliability.

Steve Dixon, CEO at Michell Bearings, said: "Although the original contract was awarded as a study, we were pleased to hear that our advice was taken on board and led to the supply of the PTFE thrust pads for the Norris unit."

Previously Engineering Director at Michell Bearings, Steve took on the role of CEO in May 2020. "We have been researching the advantages of PTFE for over 20 years and so we were confident that the material would solve TVA's problem."

Michell Bearings and TVA are working on an additional two projects at the Cherokee and Douglas hydropower plants. Michell Bearings will be presenting a paper on the findings of this project at the Hydrovision exhibition in June 2021.

For more information visit: www.michellbearings.com








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— Needle roller bearings also play a major role in topics of future importance such as lightweight robots. Here, they ensure the necessary rigidity while requiring little space. (photo:Schaeffler)

70 years old but with an entire future ahead:

The cage-guided needle roller bearing from SCHAEFFLER

- In 1950, the idea of a cage-guided needle roller bearing conceived by Dr.-Ing. E.h. Georg Schaeffler was filed as a patent application, which revolutionised bearing technology
- Georg F. W. Schaeffler: “One of the most important innovations in our company's history as an automotive and industrial supplier”
- The cage-guided needle roller bearing also plays an exceptional role in topics of future importance, such as collaborative robotics and electromobility
- More than 100 billion Schaeffler needle roller bearings have already been sold

Birmingham, UK | 09. December 2020 | 70 years ago, Dr.-Ing. E.h. Georg Schaeffler revolutionised bearing technology. The idea: to improve guidance of the needles in the needle roller bearing by using a cage. The first practical tests involving cage-guided needle roller bearings began in February 1950. The results were convincing – the components exhibited extremely low wear and friction. The application for a patent in September 1950 laid the foundation for the product's success. In February 1951, just one year after construction of the first prototype, the first volume production orders were obtained from automotive manufacturers, and use in industrial applications was to follow. "With this invention, my father, Georg Schaeffler, laid the foundation for the rapid growth of our company. The cage-guided needle roller bearing is one of the most important innovations in our company's history as an automotive and industrial supplier," says Georg F. W. Schaeffler, Family Shareholder and Chairman of the Supervisory Board. "The development of this very product is, in itself, an impressive example of what sets us apart: we have utilised all synergies in the cage-guided needle roller bearing, which will allow us to serve all relevant target markets with this innovative product and generate real customer benefits – in both the automotive and the industrial sector."

— With the idea of the needle cage, Dr.-Ing. E.h. Georg Schaeffler revolutionised bearing technology. (photo:Schaeffler)

Higher speeds with less friction

With the invention Dr.-Ing. E.h. Georg Schaeffler eliminated the serious disadvantages associated with the full complement needle roller bearings that had previously been used as standard – the long needle rollers tended to move in a transverse direction during rotation of the bearing (skewing), which would then cause the bearing to jam. Furthermore, a substantial amount of sliding friction was generated between the counter-rotating needle rollers. The development of the new needle cage overcame these disadvantages and permitted considerably higher speeds and less friction. This allowed engineers to substitute other bearing designs for cage-guided needle roller bearings and significantly improve the performance of their applications.

— Brothers Dr. Wilhelm and Dr.-Ing E.h. Georg Schaeffler set out to see the customer armed with a sample case of various needle roller bearings. (photo:Schaeffler)

— Replica of the first cage-guided needle roller bearing from Schaeffler. (photo:Schaeffler)

— Insight into needle roller bearing production in 1950. (photo:Schaeffler)

In particular, needle roller bearings made an invaluable contribution to the development of small, high-performance, and affordable vehicles. “Without reliable needle roller bearings, modern automotive drives would still be inconceivable today,” says Matthias Zink, CEO Automotive Technologies at Schaeffler. The use of needle roller bearings in mechanical and plant engineering, construction and agricultural machinery, and in conveyor technology, was also being gradually introduced.

Role in future markets

Needle roller bearings will continue to play a key role in the future. In e-mobility, needle roller bearings are vital for the function of numerous electrified transmissions. Needle roller and cage assemblies facilitate bearing arrangements with a minimal design envelope, since their section height only corresponds to the diameter of the needle rollers. In addition, they have a high load carrying capacity and are inexpensive compared with other bearing designs. KZK needle roller bearings (crank pin cages) are used, for example, in e-axles with a coaxial design. One application example is the Schaeffler e-axle drive, which has been produced for the Audi e-tron since 2018.

—Example of an automotive application for needle bearings: The Schaeffler e-axle drive, which has been produced for the Audi e-tron since 2018. (photo:Schaeffler)

In industry too, where lightweight robots are increasingly in demand, the use of needle bearings permits light and compact joint designs by means of downsizing. The needle bearings provide minimal variability and the highest level of safety. The most recent example is the angular contact needle roller bearing XZU from Schaeffler, which is used both as an articulated arm bearing in lightweight robots and cobots, and as the main bearing arrangement in the new RTWH precision gearbox, a ready-to-install reduction gear unit for robot joints.

Technological development

What originally started life as an ingenious idea by Dr.-Ing. E.h. Georg Schaeffler, has been continuously developed by Schaeffler engineers over the course of 70 years, both in terms of performance and the variety of available types. Compared to a machined needle roller bearing from the 1950s, the operating life for bearings with the same dimensions has increased 15-fold, and the static load carrying capacity has tripled. The power density, which has been enormously improved thanks to the needle roller and cage assembly, offers considerable downsizing potential for applications that are easier on energy and resources.

— The angular contact needle roller bearing XZU from Schaeffler is used in lightweight robots and collaborative robots. (photo:Schaeffler)

There has also been a steady increase in the variety of types. Today, the Schaeffler needle roller bearing portfolio comprises more than 15,000 variants to fulfill a wide variety of requirements. Since the patent application was filed 70 years ago, Schaeffler has sold a total of more than 100 billion needle roller bearings. The length of the wires used in the production of 60 billion needle roller bearings annually would be sufficient to wind around the earth's equator 18 times. Almost 170 million needle rollers are produced from this wire every day.

simatool – the right choice for tools

The correct mounting and dismounting of bearings and radial shaft seals is impossible without the right special tools. Did you know that 16% of early bearing failures are due to improper removal?

If the necessary tools are missing, unnecessarily high loading forces arise during installation, which is reflected in the short service life of the bearings. In addition, standstill production plants mean loss of profit, which ultimately results in high costs for the company.

– Dismount a deep groove ball bearing from a housing with the simatool BP 160

During maintenance work, there is always great time pressure in which every minute or even every second is crucial. For these reasons, choosing the right tool is fundamental!

Under the name simatool, the Swiss manufacturer simatec offers a wide range of proven, high-quality tools, the best prerequisites for quick, safe and professional work.

For this reason, the simatool tool sets have been used around the world for almost 40 years in machine and maintenance workshops in almost every industry. The tools enable the user to carry out maintenance work much faster, safer and gentler. All tools are made from premium materials with Swiss precision and quality. The simatools come in a robust plastic case and are easy to take with you to any location.

—simatool Product overview

What solutions does simatec offer?

Fitting Tool FT 33, Fitting Tool FT-P: Mounting of rolling bearings on shafts and in housings by hammering or pressing with a bore diameter of 10-80 mm.

Ball Bearing Puller BP61, Ball Bearing Puller BP 160: Disassembly of over 110 different deep groove ball bearings from shafts and from housings with a bore diameter of 10-160 mm.

Seal Puller SP 50: The Seal Puller SP 50 toolset can be used to remove radial shaft seals with extreme ease.

Twin Puller TP 150: Combination BP 61 + SP 50 for dismounting deep groove ball bearings and radial shaft seals

Maintenance Kit MK 10-30: Combination FT33 + BP 61 + SP 50 for mounting and dismounting of bearings and radial shaft seals

Bearing Handling Tool BHT: This enables very large bearings to be brought into the desired position safely and in the correct position before assembly. Available in two different sizes.

—The simatool BP 160 comes in a custom molded carrying case

New simatool toolset: Bearing Puller BP 160 – Professional removal kit for all hard jobs

simatec ag has expanded its simatool product range and, with the BP 160 bearing puller, has created an extension to the BP 61, which has already proven itself a thousand times over. The new

simatool toolset offers the ideal solution for removing larger deep groove ball bearings.

Application area

The Bearing Puller BP 160 removal tool set is the perfect tool for the professional removal of over 50 different deep groove ball bearings with an inner diameter of 30 mm to 160 mm. The BP 160 also offers the right solution if the bearing has to be removed from a shaft and a housing at the same time. But how is that possible? For removal, the bearing cage must be opened at two opposite points in order to insert the ball adapter in the bearing race. These are then rotated 90 degrees so that the ball adapters can guarantee a secure hold during the pull-off process.

Of course, this innovative method also offers the right solutions for expansion situations from shafts or from housings. Sealed bearings can also be easily removed with our simatool Seal Puller SP 50 after removing the corresponding seal.

— Dismount a deep groove ball bearing from a shaft and from a housing with the simatool BP 160

— simatool Bearing Puller BP 160

Benefits

The compact tool case contains a spindle with centering attachment, a pulling arm support beam, pull rods, extensions and six high-quality ball adapter pairs. The following advantages result from this:

- √ The spindle is already screwed into the pulling arm support beam and makes the tool ready for use faster than the competition.
- √ The self-retaining spindle attachment ensures a symmetrical application of force and thus reduces the risk of damaging the shaft due slipping to a minimum
- √ Adjacent components do not have to be removed, which leads to considerable time savings
- √ All tool components are available as spare parts

Detailed information and which solutions are offered with simatool toolsets can be found at www.simatec.com

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Lead-free plain bearing solutions for commercial vehicle and industrial applications

KS Kolbenschmidt has further expanded its portfolio of plain bearings for commercial vehicle and industrial customers. The main focus is on the complete elimination of the heavy metal lead and thus the implementation of future-proof, eco-friendly solutions for any application. The supplier is also supporting customers with all-embracing services including the efficient development of the bearing design, test vehicle diagnostics, EHD simulation or customer-specific tests on in-house test benches.

Lead is still a widely used industrial metal, valued for its enhanced formability and workability as well as its resistance to weathering and corrosion. However, this heavy metal is also harmful to the environment and health. The Plain Bearings unit of KS Kolbenschmidt therefore early on dispensed with lead in its new developments and thus took a leading role in the changeover to zero-lead-bearings in the EU passenger car segment where since 2011, it has been using only lead-free plain bearings.

Based on the experience gained in the passenger car sector, it is recommended that commercial vehicle and industrial customers also start converting to lead-free plain bearing solutions at an early stage. Particularly in view of the long product life cycles, it is important to ensure that the material design is future-proof today. KS Kolbenschmidt offers high-performance, lead-free solutions in all product families. These range from machined solid bronze components through wound bushings and thrust washers made of various steel composite materials to coated high-performance bearings.

Main and connecting rod bearings for commercial vehicle engines

When it comes to engine plain bearings for commercial vehicles, this plain bearing expert can draw on its many years of series production experience with lead-free crankshaft and connecting rod bearings in the passenger car sector: the lead-free steel/aluminum bearing shells KS R25 and KS R53 have proven their robustness millions of times over in series production.

Depending on the engine concept and application area, however, the polymer-coated bearing shells KS R53L1 and KS R55L1, the lead-free electroplated bearing KS S213D or the high-performance sputter bearing KS S213W can also be used as all are lead-free and thus future-proof.

Applications for industry and off-road

Apart from the combustion engine, low-maintenance or maintenance-free metal-polymer plain bearings of the Permaglide proprietary brand are frequently used in commercial vehicle and industrial applications. Here, too, KS Kolbenschmidt offers zero-lead solutions: steel-bronze-PTFE plain bearings such as KS P141 and KS P180 which combine extremely low coefficients of friction with high wear resistance. Or the innovative steel-bronze thermoplastic plain bearings KS P240, KS P241 and KS P243. These are particularly suitable for high-duty, grease-lubricated applications. The performance and reliability of these lead-free solutions have been proven, for example, in the actuators of commercial vehicle brakes. Following successful customer validation, KS Kolbenschmidt is supplying the first series applications in which leaded bearings have been completely eliminated.

In off-road and industrial applications, lead-bronze and brass materials that are easy to machine have proven themselves over decades and are predominantly machined. The in-house continuous casting plant makes it possible to offer customers lead-free solutions in this area as well. The aluminum bronze KS 920, for example, is noted for its high mechanical strength and excellent corrosion resistance. Kolbenschmidt offers the high-precision components made from this in a wide range of dimensions.

How To ?
Upskill Face-to-Face Salespeople for Virtual Sales

We have never experienced so much market disruption, constraints and uncertainty. Salespeople who once visited end users and observed their industrial mechanical bearing challenges may not be allowed to enter buildings. Resilient sales teams are adapting to the new normal and many once face-to-face meetings are being replaced with virtual meetings.

What challenges are sales teams experiencing and how do we coach and train salespeople to be effective in a virtual sales environment?

Prior to Covid-19 we experienced:

- Buyers moving to ecommerce and digital
- 45% of sales were closed remotely
- 92% of sales involved a phone call
- 50% of buyers shared in a recent study they are buying what they bought in prior years
- 22% of buyers shared they are buying more than they bought in prior years
- 45% of buyers have shared they have experienced supply chain interruptions
- 89% of senior leads shared building business relationships with customers are critical to success
- Only 15% of sales teams have been trained how to strategically build business relationships to the status of trusted advisor

Salespeople achieving quota has declined each year since 2016 and I predict less than 50% of salespeople will achieve their sales goals in 2020.

60% of once face-to-face salespeople are struggling to sell virtually today

If you have not trained your once Face-to-Face salespeople how to sell virtually it is very likely 60% of your sales team are struggling, disengaged and frustrated today.

We recently conducted customer research for a distributor and just over 60% of their customers shared they preferred virtual selling to face-to-face meetings.

What are the top sales skills virtual sales teams must improve?

#1 Sales Mindset

The first place we need to start to gain any sales velocity is to understand your sales team's mindset and reframe any limiting beliefs.

"You are helping your customers solve problems and overcome challenges not selling them something they do not need!"

#2 Sales Skills

Sadly less than 50% of sales teams have received sales skills training.

I suggest you assess your salespeople and pay particular attention to skills needed in virtual selling like: Qualifying, Active Listening, Comfort using various online meeting tools and the ability to deliver a concise business case based on value.

#3 Value propositions

Do your salespeople have a current value proposition designed for their ideal customer profile today?

Does your sales team have messaging for each buyer persona?

Sadly most Sales teams I find are using a dated value proposition and are growing frustrated and often not engaged when what has always worked no longer resonates with customers.

#4 Industry Knowledge

What buyer's want and value today are insights and advice not found on most company websites.

Buyers value the salesperson's market experience and learning how others in the industry have solved problems they are facing now.

Have you equipped your salespeople with success stories that highlight the value your products and services provide?

#5 Know How Your Customers Make Money

Buyers share on win loss calls how they want and need sales reps to become trusted advisors connecting what they are selling to the impact it has on the buyers bottom line...but sadly only 15% of salespeople have mastered this skill today.

In conclusion..

The current market challenges have made serving your customers more difficult.Sales teams must adapt and understand how their customers want and need to be served.

If your sales team would like some help conducting voice of customer research to update your value proposition and messaging let's schedule a call.

If you want to assess your sales team's skills and understand the training they need to be effective in virtual sales please contact me and let's schedule a call.

About the Author:

Mark Roberts *is a senior level sales and marketing leader with over 35 years' experience driving profitable sales growth in market leading organizations.*

He has led sales and training at companies like Timken, VMI, Gardner Denver, Mobility Works, and Frito-Lay. Mark is an author, public speaker, sales trainer, and sales coach. In 2018, he received the Business Excellence award from National Sales and Marketing Association and in 2019, The Highspot Sales Enablement Award. He was also recognized by Sales Hacker Inc. in the Sales Enablement Category. Mark is the founder of OTB Solutions, LLC and the popular business development blog, www.nosmokeandmirrors.com , ranked #1 in fixing sales problems. Today, he is the founder and president of OTB Sales where he helps clients diagnose and improve sales effectiveness, and hire and develop their sales talent to improve sales results. His prescriptive data driven approach to sales training and coaching he learned while attending Harvard delivers the maximum ROI in the shortest amount of time.

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MAK CHEM & LUBES join A&S International Ltd

MAK CHEM International & MAK LUBES International brands become part of the growing product range represented by the UK based technical sales consultancy.

THEALE, Reading, Berkshire, UK - A&S International is excited to start the new year with not one but two excellent new additions to its growing range of quality brands. MAK CHEM's range of maintenance chemicals have been acquired along with the MAK LUBES range of maintenance lubricants.

A&S International will offer both product lines to their global distributor network & developing UK direct client base with immediate effect. Sales of these new quality maintenance chemicals & lubricants steadily grew during the second half of 2020 despite the limiting business conditions created by the COVID-19 pandemic.

Particular success has already been enjoyed by the MAK CHEM brand in Greece, Philippines & Portugal. The majority of the products can be easily & effectively demonstrated to clients; however, due to the current inability to visit industrial sites in many countries, a range of demonstration videos have been produced for inclusion on the corporate websites & social media.

Companies that are interested in the profitable business opportunity of marketing & selling the MAK CHEM & MAK LUBES product lines in their territories should contact the A&S International team via the website. New distributor partners will be warmly welcomed & assisted with product training and prompt technical support: www.aands.international/contact

> "It is fantastic to start 2021 with the great news that the MAK CHEM & LUBES International brands are now part of our growing range of products. We have ambitious plans to develop the global sales of these high-performance maintenance chemicals & lubricants via our team of loyal distributors, direct clients here in the UK as well as a new network of distributors. Our team is pleased to see the high level of interest from around the world despite the continuing challenges of doing business in a pandemic."
>
> *Commented Angus Macdonald, Co-Founder & Director of A&S International Ltd.*

About A&S International Ltd

An experienced technical sales consultancy representing a range of quality brands via a global network of expert, qualified distributors. Products include Viper Wire Rope Lubricator, TST Flaw Detection, Oil Spill Eater II Bioremediation, isoPOD, FLUITEC International & 5th Order Industry Training. www.aands.international

About MAK CHEM International

Premium performing chemical products for cleaning, maintenance and improving machine performance – including NSF Registered cleaning solutions for the food & beverage industries. MAK CHEM delivers cost-effective cleaning solutions for maintenance teams around the globe. www.mak-chem.org

About MAK LUBES International

High performance industrial lubricants including greases & gear oils for reducing maintenance & operating costs. A team with over 100 years of specialist knowledge and experience in maintenance lubricants delivering game-changing solutions for our clients. Our talented team utilise the mix of premium products and technical expertise to help our clients & distributors to achieve, and in many cases exceed, all their key goals. www.mak-lubes.org

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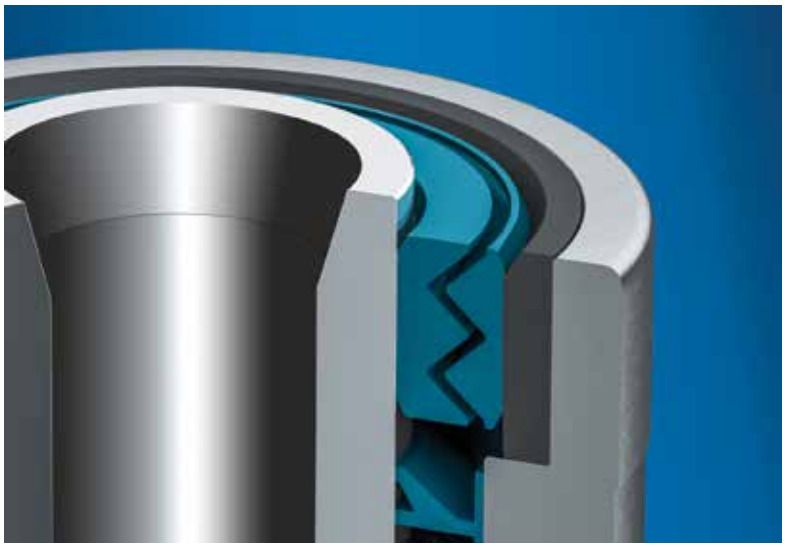
HeavyDuty rotary encoders
the high precision heavyweight champions

HeavyDuty rotary encoders from Baumer Hübner are the "original". More than half a century ago, Baumer Hübner developed this type of particularly reliable and robust rotary encoders. Since then they have been used in all situations where the going is tough and where failure is not an option. What distinguishes a HeavyDuty rotary encoder exactly and what options do they offer users?

Dockside cranes that unload thousands of tons of shipped goods daily. Conveyor systems that carry thousands of tons of mined ore from mining plants across many kilometers. Elevators that carry thousands of people daily. Automated production lines on which automobiles in various assembly stages are transported. Lifting bridges with a total weight of 1000s of tons that can carry several trains at once and that are lifted many times per day to allow ships to pass. These and many other application scenarios constitute the world of HeavyDuty rotary encoders – anytime difficult tasks must be reliably carried out under difficult conditions and over the long term.



— The sophisticated HeavyDuty impermeability concept from Baumer conforms to protection classes IP 66 and IP 67 within a broad temperature range of up to +95 degrees Celsius. Thanks to an ingenious combination of labyrinth and shaft seals, Baumer HeavyDuty rotary encoders are permanently optimally protected against all types of solids, moisture, and contamination by adherence.

The term has been linked to Hübner Berlin since the 1950s, when the company established the supreme rotary encoder class. Since that time, Hübner Berlin, which today belongs to sensor specialist Baumer, has continuously improved its products and is still considered the expert provider of HeavyDuty rotary encoders. But what do we mean when we talk about HeavyDuty products? After all, the term is not legally protected or regulated by a standard. "Heavy duty" as such simply means hard-wearing. A possible reason why some people think that HeavyDuty rotary encoders are simply encoders with thick housing walls and rust protection. In reality, the term denotes much much more.

What makes a rotary encoder "HeavyDuty"?

To Baumer Hübner, "HeavyDuty" is an all-encompassing performance promise. First of all, this means that such a rotary encoder never lets its user down, even under the most difficult conditions. And secondly that these heavyweights work as precisely as "small" rotary encoders for an extended period of time. HeavyDuty rotary encoders from Baumer Hübner accomplish this through four characteristics: Precision: A rotary encoder must deliver reliable signals to allow users to precisely control and regulate drives and generators. Plant control systems utilize these signals for speed monitoring of drives or for position feedback of machine parts. To controllers, this information is the only way to get informed and intervene, for example, if a drive exceeds or falls below a defined speed limit. Since the machines and systems are usually very big – dock cranes, bucket-wheel excavators, rolling mills, garbage shredders – they could give the above-mentioned impression that precision does not matter much. That is a mistake. Particularly because heavy loads are moved with great force, small measuring errors could have extensive consequences, for example, when setting down a container weighing several tons.

Mechanical robustness: a HeavyDuty rotary encoder must be so resilient that it can withstand hard shocks, vibration, and forces on the rotary encoder shaft for many years. Exchanging rotary encoders is expensive, not because of pricing but because of installation in places difficult to access and the system being down for the time of exchange. HeavyDuty rotary encoders are distinguished by several characteristics: Double-sided bearing setup with generously dimensioned, largely spaced bearings at both shaft ends to compensate axial and radial load, robust and thick-walled housings, and durable protection of the inside components against shocks and vibration.

— The revolutionary concept of absolute HeavyDuty rotary encoders of the HMG 10 / PMG 10 series from Baumer Hübner combines the well tried and tested double-sided bearing setup with magnetic precision sensing and the patented Energy Harvesting micro-generator in a revolutionary concept.

— HeavyDuty rotary encoders from Baumer Hübner excel through a robust design with bearings at both shaft ends. Thanks to unmatched resistance to axial and radial load, this double-sided bearing setup ensures maximum mechanical reserve capacity and unrivalled long service life.

Tightness: HeavyDuty rotary encoders are usually deployed in dusty, soiled, and damp environments. For this reason, the HeavyDuty encoder housing must be well sealed, especially at critical, neuralgic points – the shaft and electrical connections. Further, in terms of potential contact to chemicals or salt water, a good corrosion protection through appropriate housing materials and coatings is mandatory.

Electrical robustness: HeavyDuty rotary encoders must be immune against electromagnetic fields. These are generated by live, unshielded cables routed nearby, which is a quite common situation in many applications. Without adequate shielding, the electronics in the rotary encoder might be destroyed or provide erroneous measuring signals. Another point are shaft currents caused by potential differences. They may burn the bearing lubrication, which results in bearing destruction. For all these reasons, the inside electronics of HeavyDuty rotary encoders must be electrically isolated from the ambiance of operation.

Whether absolute or incremental – above the standard

As described above, there are diverse application areas for HeavyDuty rotary encoders. Therefore, the HeavyDuty portfolio of Baumer Hübner is just as diverse with many variations of incremental or absolute rotary encoders. The HOG 10 / POG 10 is the reference device among incremental rotary encoders. The rotary encoder HOG10 provides even more features only offered by Baumer that can enormously increase the fitting accuracy, as shown by the following two examples:

HeavyDuty rotary encoders are usually deployed in harsh environments with exposure to dust, moisture, and chemicals and therefore require powerful protective seals. But not all seals are equal. This is why HOG 10 is available with several sealing concepts for optimum protection in oily, damp, or dusty environments, for use in tropical and offshore climates, in cement works or other demanding environments. There are, for example, reliable and absolutely wear-free seals that endure impacts by coarse and fine-grained solids and whose sealing components function with absolute wear and tear durability. In addition, sealing free from friction prevents any performance loss. Such a sealing concept is most efficient and less energy-consuming at high speed.

Since HeavyDuty rotary encoders are generally deployed in giant installations, signal transmission must often cover a distance of 100 meters or more. For this reason Baumer attaches great importance to excellent signal quality and high-power outputs using short-circuit proof power transistors. There are even product variants that are capable of a distance up to 550 meters. Where this is not sufficient, fiber optic cables ensure noise-immune signal transmission over a distance of 1.5 kilometers.

Similarly, absolute rotary encoders such as the HMG 10 / PMG 10 also have special features beyond those of standard encoders: for example, providing precise position outputs via PROFINET. Frequently, incremental signals are also required for speed feedback in absolute rotary encoders, which is why absolute HeavyDuty encoders deliver speed signals in addition to the absolute position, for example as HTL or TTL, via serial digital interfaces such as SSI or fieldbus. Some product variants even integrate a speed switch for limit speed information via switching output.

Flexible solutions for every application

There are various mounting options, whether as hollow shaft designs (through or non-through), cone shaft, or solid shaft with optional EURO flange B10 connection. If required, HeavyDuty rotary encoders, speed switches, and tacho generators can be combined in one single robust, space-saving unit to provide varied types of output signals measured at a single drive shaft all at once. Large encoders such as HOG 16 / 22 /28 from Baumer are used for maximum speed limit monitoring of large drive shafts under the most difficult conditions, such as in coal dust, corrosive air, or in the burning heat of steel mills.

Due to the many available options, interested buyers should best check first together with our experts which HeavyDuty rotary encoder is appropriate for the intended application. No matter what product you opt for in the end – above-average precision and durability are always part of the package of HeavyDuty rotary encoders from Baumer Hübner.

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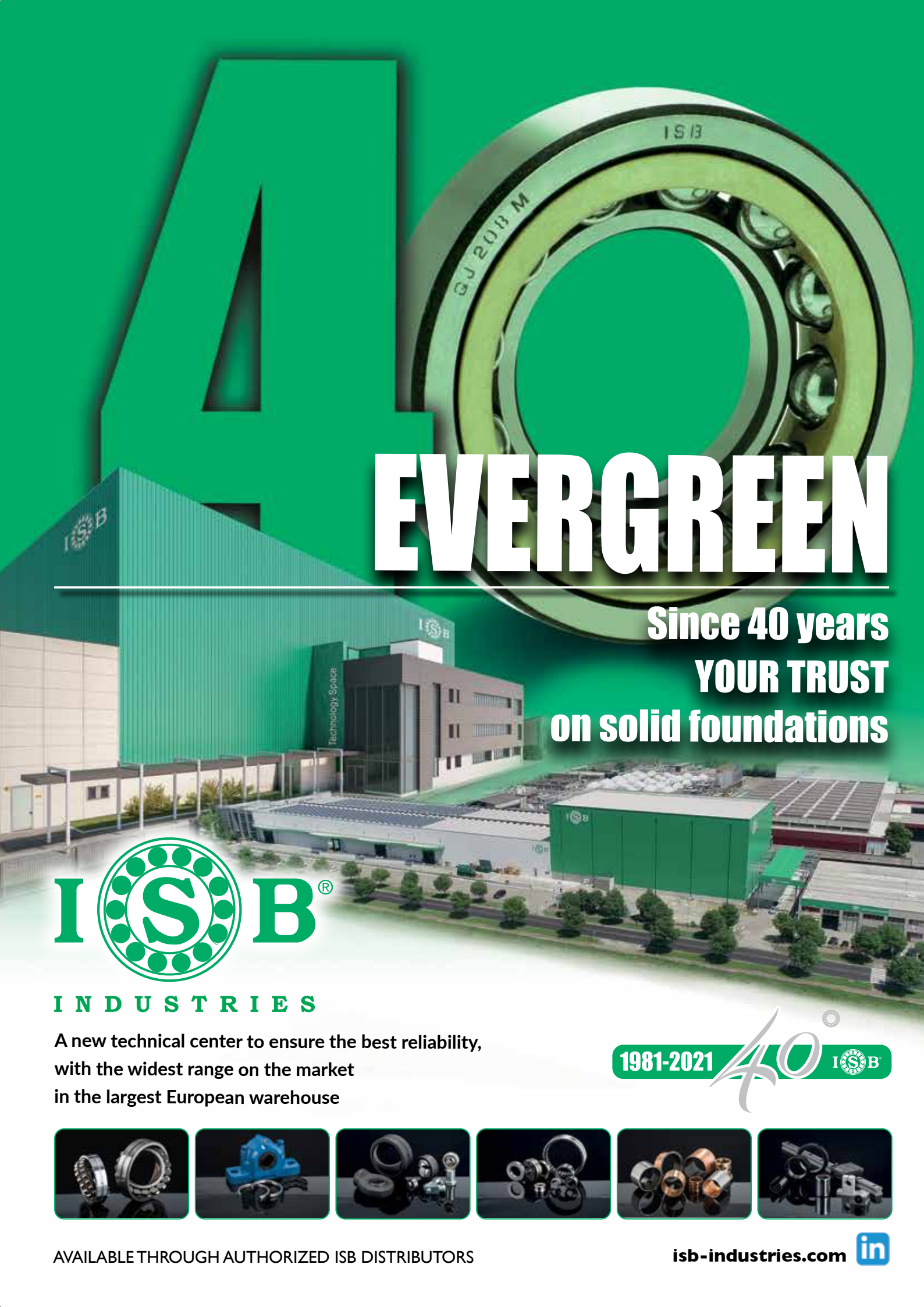
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