

1/2017 | AFRICA

Schaeffler's Sales Partner Magazine

forum



Rolling Bearings and Services
for Mining and Processing

SCHAEFFLER

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Belt conveyor system reliably supplied with lubricating grease by more than 100 FAG CONCEPT8 lubricating systems



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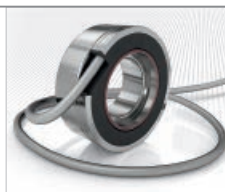


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BEARINGS 2000 (PTY) LTD

We meet an authorized Schaeffler sales partner from South Africa



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SHARED GROWTH

Dear Sales Partners,

Distributors now play an important role in fulfilling market requirements, particularly in the sectors that Schaeffler Industrial groups together as “Raw Materials”. Machine modernizations and the use of higher-performance rolling bearings matching the state of the art are common here during product lifecycles, which can span several decades.

After all, applications in this area are typically characterized by very high costs, which are generated by machine downtimes as a result of maintenance work and unplanned failures. Besides production downtimes, further damage can also occur in the application environment. This makes it all the more important to ensure high quality and optimum performance when it comes to rolling bearings, e.g. with the X-life design, the ideal selection and supply of lubricant for the application’s requirements, and the early detection of incipient wear through the use of condition monitoring systems.

More and more of our customers are analyzing the overall operating costs (TCO) of their applications. The solutions involved here are becoming increasingly digital, including commercial analysis, the sensorization of machinery, the creation of “virtual twins”, the integration of ordering systems, and logistical processing. Counterfeit products are the absolute antithesis of these requirements. In this issue of forum, you can also read about how we are working together to combat the counterfeiters.

Wolfgang Czarnach

Vice President Regional Business Unit Raw Materials
Industrial Europe



FAG CONCEPT8

KEEPS THE CONVEYOR BELT MOVING

The power plant Mátrai Erőmű Zrt. at Visonta is a subsidiary of RWE Power and one of the largest power plants in Hungary. The company has one power plant and two opencast mines at Visonta and Bükkabrany.

THE CHALLENGE

At the Visonta opencast mine, coal is transported towards the power plant along kilometers of conveyor belt. In order to ensure problem-free running, these require optimum lubrication – despite the contamination and strong vibrations. Furthermore, the lubrication points are often difficult to access or are in isolated locations. The customer was therefore looking for a relubrication system that could extend the lifetime of the rolling bearings on the conveyor belt plant and reduce the manual service work required.

SCHAEFFLER SOLUTION

The local Schaeffler distribution partner Euro-Borsod Trade Kft. recommended the lubrication system FAG CONCEPT8, filled with Schaeffler quality lubricants from the Arcanol

range. This combination allows continuous and reliable lubrication of the rolling bearings on the drums during ongoing operation. Installation of the lubrication systems as well as their ongoing maintenance and the replacement of lubricant cartridges was also undertaken by the authorized Schaeffler distribution partner.

CUSTOMER BENEFIT

The FAG CONCEPT8 system has proved itself reliable under the challenging ambient conditions in the power plant. Between 2014 and 2016, more than 100 lubricators were fitted, together with the matching lubricant cartridges. They now ensure a reliable lubricant supply to all the drum rolling bearings in the belt conveyor system. The risk of premature bearing wear, which can lead to a breakdown of the entire belt conveyor system, has been minimized. From a personnel perspective, it has been possible during this time to significantly reduce outlay not only on manual relubrication but also on time-consuming repairs. In particular, the customer was convinced in



▲ Belt tension pulley for spoil conveyor belt

technical terms by the ease of operation and the robust design of the lubrication system.

IN CONCLUSION

Since the Schaeffler solution and partnership were so satisfactory, it was decided that the opencast mine at Bükkabrany will also be equipped with Schaeffler products.



▲ FAG CONCEPT8 with Arcanol MULTITOP for belt tension pulley bearings



▲ Spoil conveyor belt in opencast mining

WE ARE YOUR PARTNER

IN THE MINING AND PROCESSING INDUSTRY

In mining and processing, rolling bearings are essential contributors to technological progress. Rough operating and environmental conditions require extremely robust bearings. More than one hundred years of experience in the rolling bearing business and a strong customer focus make Schaeffler an excellent choice as a partner.

Customers from sixty industrial sectors rely on the high quality of FAG and INA products. Our product range of over 225,000 industrial products is one of the largest in the rolling bearing industry. Condition monitoring systems,

mounting services, and maintenance tools complete our range. All of this ensures that we can offer a solution for virtually any application in the mining and processing industry.

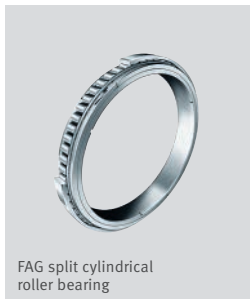
Intensive research and development as well as constant close work with manufacturers and operators all result in high levels of operational reliability for our bearings. In addition, our solutions always offer economic benefits – and this increases their efficiency.

To find out more about our solutions, visit www.schaeffler.com or contact your Schaeffler contact partner.

PRODUCTS AND SERVICES FOR YOUR SUCCESS



INA and FAG cylindrical roller bearing



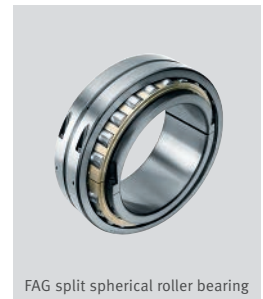
FAG split cylindrical roller bearing



INA axial cylindrical roller bearing



FAG spherical roller bearing



FAG split spherical roller bearing



FAG axial spherical roller bearing



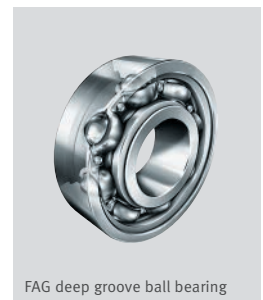
FAG tapered roller bearing



INA slewing ring



FAG four-point contact ball bearing



FAG deep groove ball bearing



INA spherical plain bearing



Machined FAG housing



Mounting service



Lubrication



Condition monitoring

INDISPENSABLE IN MINING

OUR SOLUTIONS MAKE A CONVINCING CASE IN THE FIELD



Various types of bearings can be found in conveyor system gearboxes, depending on the output required, the available design envelope, and the transmission ratio.

For the drive pulleys, we recommend split or unsplit FAG spherical roller bearings. Both types are equally capable of withstanding high loads and permit the compensation of misalignments and shaft deflections. From an economic point of view, using split spherical roller bearings is a good solution because replacing these bearings involves significantly fewer steps and takes less time.

For the non-driven return pulleys, most of which have internal bearings, special cylindrical roller bearings or spherical roller bearings are used. These bearings are particularly durable and very maintenance-friendly due to their long relubrication intervals.



▲ Split and sealed spherical roller bearing

Conveyor systems such as belt conveyors move immense amounts of material across large distances every day, making them indispensable in mining. The main applications for rolling bearings in conveyor systems include gearboxes, pulleys, and idlers.

▲ SPECIAL SERVICE: MOUNTING SERVICES



Our experienced mounting technicians can help you install and remove rolling bearings and provide advice on selecting the right mounting tools. Proper mounting is an essential prerequisite for achieving the bearing's maximum rating life.



A practical example

A surface mining company wanted to replace the bearings on the bucket wheel shaft of an excavator without having to remove the gearbox in the field to save time and costs.

Schaeffler worked closely with this customer to develop a tailor-made bearing for these requirements as well as special mounting tools. All of the required mounting and removal steps were prepared and carried out with the customer. This allowed the bearing to be replaced during a short, planned downtime, considerably reducing time and costs.



NON-STOP OPERATION IN SURFACE MINING ALL OVER THE WORLD: DUMP TRUCKS

Many impressive Schaeffler solutions are hidden in the huge wheels of dump trucks. They include not only extremely durable wheel bearings for front and rear wheels, but also complete bearing solutions for the engines and planetary gears that are integrated into the rear wheels.

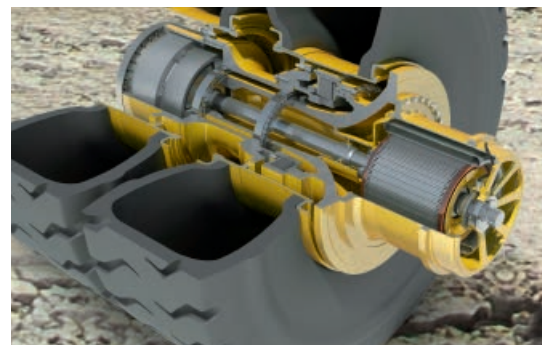
The main bearing supports for the rear wheel, for instance, are designed with two tapered roller bearings measuring up to one meter each in an O arrangement. The result is a compact design with high load carrying capacity and rigidity that offers a very long operating life. One of the reasons: Case hardening makes the bearings less sensitive to vibrations and shock loads. They are more wear-resistant, have good overrolling resistance, and reduce crack formation due to surface damage. This increases the rating life of the bearing.

For electric motors, we use current-insulated deep groove ball bearings and cylindrical roller bearings to prevent damage from electric current. These bearings have long relubrication intervals and are

suitable for large temperature fluctuations. FAG cylindrical roller bearings with robust brass cages are the ideal solution here.

OUR RECOMMENDATION FOR GEAR-BOXES

The planetary gears in the dump trucks primarily contain spherical roller bearings and cylindrical roller bearings. These bearings have a very high load carrying capacity – all in a very small design envelope. They also feature narrow tolerances which, in combination with the specially selected internal clearance, permit the loads to be distributed evenly. Thanks to cages customized for this specific application, large centrifugal forces can be absorbed reliably.



▲ Compact and durable: Bearings for planetary gearboxes

ROBUST, PRECISE, VERSATILE

TAPERED ROLLER BEARINGS IN INDUSTRIAL APPLICATIONS



▲ Axle bearing supports in agricultural machinery



▲ Rolling mills in the steel industry



▲ Grinding rollers in vertical mills



▲ Oil and gas conveyance technology



▲ Drill head bearings in the mining industry



Tapered roller bearings are characterized by high radial and axial load carrying capacity and by a large usable speed range. They are efficient at supporting forces and ensure a precise and rigid shaft guidance system due to the large effective distance between the bearings. They are adjustable, can be dismantled, and are therefore easy to fit. However, the increasing productivity in industry means that rising demands are being made of tapered roller bearings as well. They should operate for longer, generate as little friction as possible, and of course be easy to maintain. Schaeffler's response: Tapered roller bearings in X-life quality.

Numerous FAG tapered roller bearing series are available in X-life quality. An example from the metallurgy industry is shown on the opposite page.

X-LIFE QUALITY PAYS OFF

A high radial load combined with a high axial force, a large speed range, precise and rigid shaft guidance, and a low maintenance outlay: It pays to use our bearings in a wide range of industrial applications.

EXAMPLE 1: AGRICULTURAL MACHINERY

FAG tapered roller bearings in X-life quality are now indispensable for the construction and agricultural machinery sectors, where efficient and high-performance bearing supports are essential. In the axle bearing, the optimized surfaces mean that a hydrodynamic lubricant film can be formed even at low speeds, e.g. during field operation. Friction and wear are reduced. Even at the pinion shaft's top speed (driving the tractor at 50 km/h on the road), the X-life tapered roller bearings prove their quality, efficiency, and durability. In addition to saving fuel, this also increases the reliability of the machine.

EXAMPLE 2: INDUSTRIAL GEARBOXES

Tapered roller bearings find use in final drive units, tapered cylindrical gear units, wheel drives, and indexing gears. Flender gear units, for example, have been operating reliably for many years thanks to large tapered roller bearings with a high load carrying capacity from FAG. Tapered roller bearing pairs have also proven themselves as robust main bearing supports in mobile device drive systems (e.g. from Bosch-Rexroth).



▲ ROLLING MILL APPLICATIONS

FAG FOUR-ROW TAPERED ROLLER BEARINGS

Conditions in rolling mills are harsh: The reason for this is that these rolling bearings are subjected to high loads (forces, speeds, and shocks) and extremely unfavorable environmental conditions (contamination, water, and temperature).

Four-row FAG tapered roller bearings are manufactured as open and sealed bearings. They are used as roll bearings in rolling mills.

INCREASED PERFORMANCE AND DOWNSIZING

With their optimized characteristics, four-row FAG tapered roller bearings in X-life quality allow performance density to be improved and make downsizing possible. The operating life of X-life bearings is considerably longer under the same operating conditions. Conversely, higher loads can now be applied while maintaining the same rating life values.

INTEGRATED SEALS

Four-row FAG tapered roller bearings are also available with integrated seals. Sealed bearings have the same design envelope as open bearings and offer the following advantages:

- Reduced grease consumption
- Increased cleanliness of the interior of the bearing
- The high-quality grease remains in the bearing
- Extended bearing operating life



CUSTOMER BENEFITS

- Increased performance
- Longer operating life in the event of particle overrolling
- Increased fatigue strength with good lubrication
- Increased resistance to wear
- Increased cleanliness of the interior of the bearing
- Reduced grease consumption

▲ X-LIFE: YOUR BENEFIT IN TOTAL COST OF OWNERSHIP

X-life offers greater efficiency throughout the entire lifecycle of our tapered roller bearings, which therefore means greater technical and economic efficiency for your application.

- Extremely reliable
- High-performance – dynamic load ratings up to 20 % higher than those of the previous design and an increase in nominal rating life of up to 70 % under the same operating conditions
- Low friction – up to 50 % less friction compared to the previous design (up to 75 % for bearings with a large contact angle due to the increased influence of the axial load) and a bearing temperature reduction of up to 20 %

SEIZED GOODS – WHAT’S NEXT?

LARGE-SCALE DESTRUCTION OF GOODS IN TURKEY



▲ The garbage dump – a fitting symbol: Counterfeits and everything that goes along with them are garbage

Istanbul, Turkey: Our story starts back in December 2015, when suspicious goods bearing the FAG brand name were seized by the vigilant customs officials at Mersin harbor. Their suspicions were first aroused by the fact that the shipment had come from China – suspicions that they immediately shared with Schaeffler’s Brand Protection Team (BPT). It was clear to the BPT that the goods were counterfeits, and they took immediate action – firstly by issuing a demand for the seizure and destruction of the counterfeit components to the local district attorney’s office. Half a container load of counterfeit Schaeffler products with a market value of around € 250,000 was then seized, and a criminal case was brought before the courts.

THE SENTENCE IS PASSED: PRISON TIME FOR THE CULPRIT

The court ordered the counterfeit products to be destroyed and sentenced the importer to a ten-month custodial sentence. He certainly learned the hard way that selling counterfeit goods does not pay.

Unscrupulous distributors who nonetheless continue to put counterfeit rolling bearings on the market are not only delivering inferior goods and causing customers to pay good money for unsuitable products – they also expose their customers to risks with unforeseeable consequences: Unplanned production downtimes, higher warranty costs when counterfeits are installed in end products, and even danger to life and limb if they cause premature failure. The only way to prevent all of this is to stop counterfeits being put into circulation in the first place. So it’s logical that they have to be destroyed – every last one.

Since the court judgment was legally binding in Turkey, the counterfeit FAG rolling bearings made the journey to their final destination – a nearby steel-processing facility, where they were fully recycled under the watchful eye of customs officials.



... THE STORY GOES ON

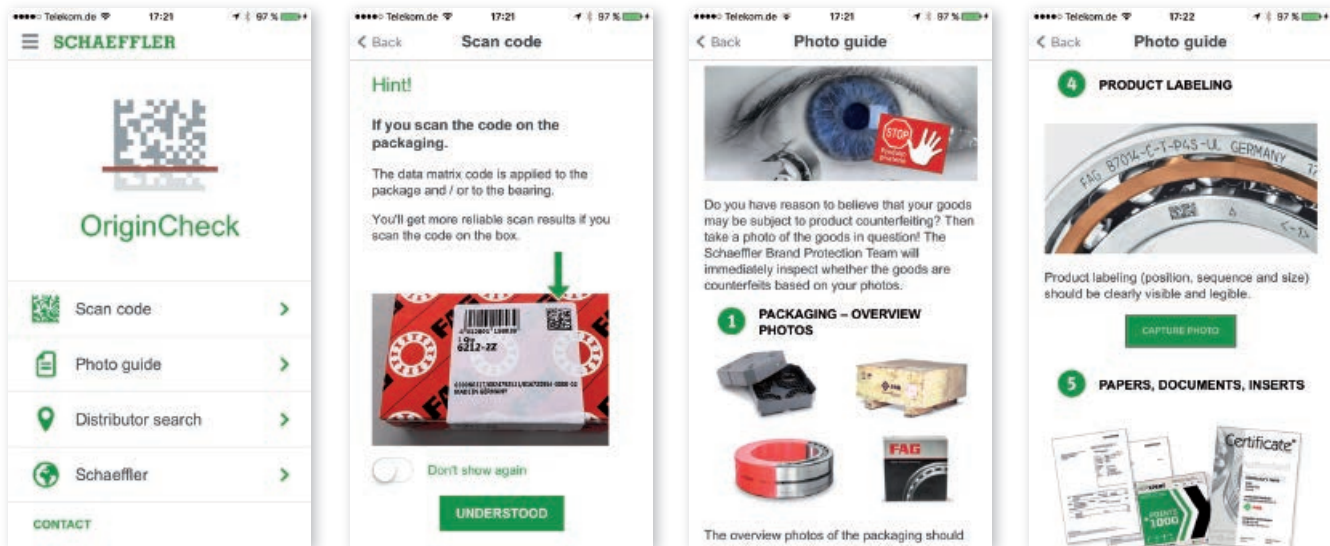
The police decided to follow up on the seizure of these goods by carrying out further raids in various cities throughout Turkey – the outcome of which included the seizure of counterfeit rolling bearings in Adana. The resulting court cases are still pending. So the BPT certainly has plenty to do! We have now introduced a new tool that will support us in our activities as we work to combat piracy – the “OriginCheck” app. This app allows everybody who purchases Schaeffler products marked with a data matrix code to verify that code. You can find out more on the next page.



▲ The counterfeit bearings were turned back into raw materials

PEACE OF MIND VIA SCAN

THE NEW ORIGINCHECK APP FROM SCHAEFFLER



Schaeffler's new OriginCheck app gives you the tools you need to quickly and easily carry out initial plausibility checks on our products. If one of these checks leads you to suspect that a product might be counterfeit, you can use the app to make direct contact with our Brand Protection Team and request clarification. The check is carried out based on the unique data matrix codes (DMC) that are placed on the packaging and which can be clearly traced.

WHAT INFORMATION DOES THE SCAN PROVIDE?

The OriginCheck app checks the DMC on the packaging and the rolling bearings themselves in real time. The user immediately receives notification regarding the authenticity of the Schaeffler DMC. The result is displayed using the following colors:

- Indicates an authentic Schaeffler DMC.
- Indicates a Schaeffler DMC that has already been scanned several times, which means that an additional check is necessary.
- Indicates an unknown DMC.

If the result of the scan is "yellow" or "red", the app can also be used to create reliable photographic documentation of the product to be checked and then send it to Schaeffler. The



The app is available for iOS and Android and can be downloaded at www.schaeffler.com/apps

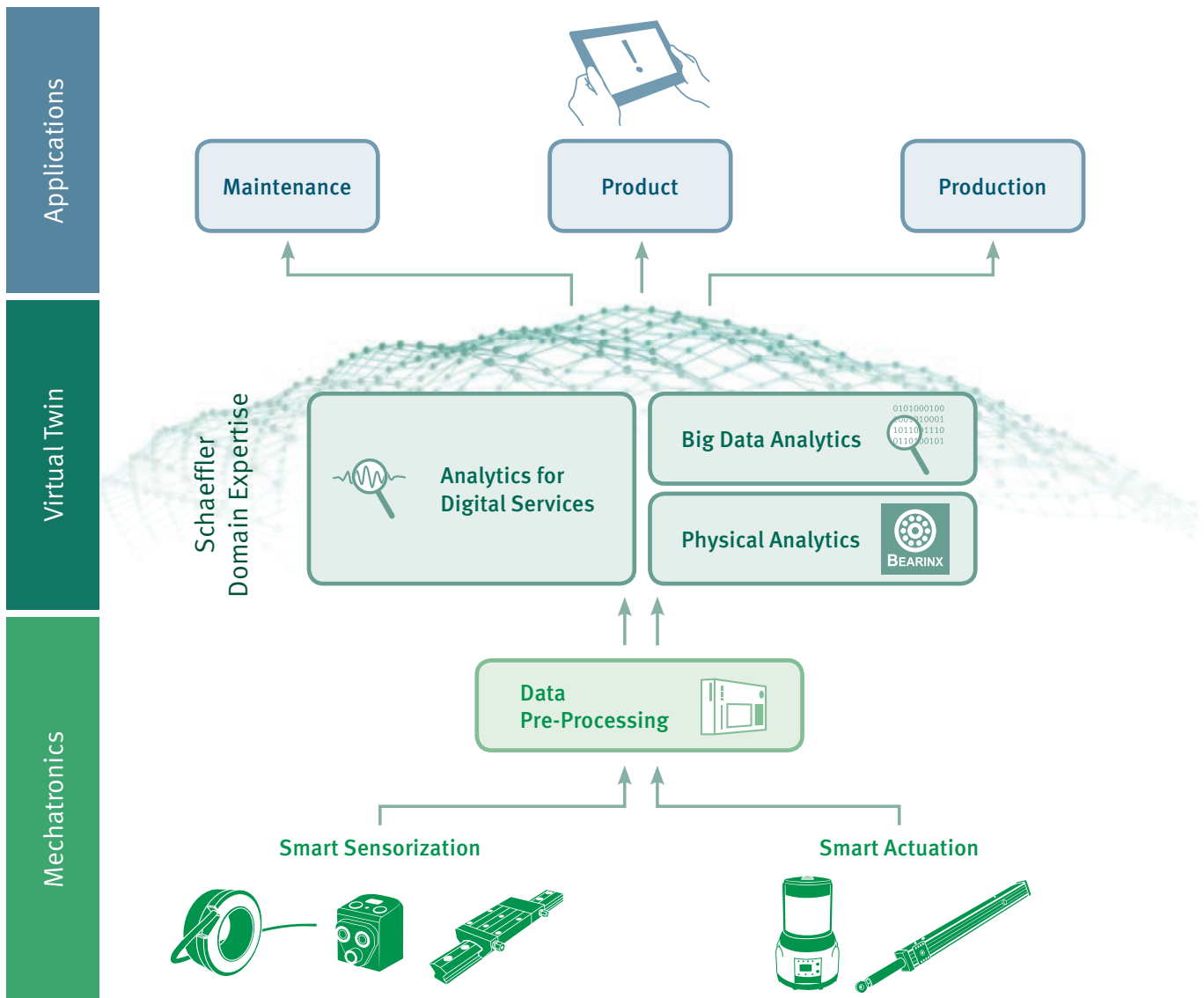
Brand Protection Team will then carry out the relevant checks and contact you.

The OriginCheck app is another step on the path to a future in which there is no risk from counterfeiters. We will keep you updated with reports from the field, so please watch this space! Please also feel free to e-mail us and tell us what you think of the new app – all opinions and comments are welcome.

Do you have any questions, problems, or ideas?
piracy@schaeffler.com

SCHAEFFLER GOES DIGITAL...

SMART ECOSYSTEM 4.0



▲ Sensors and mechatronic products from Schaeffler record data at central points in the customer's application, and these data are transformed into information in the cloud with the help of our calculation and modeling systems. The customer can then use this information in the form of digital services to control processes, maximize availability, and optimize product quality.

You want to get a fast and easy start in the world of Industry 4.0? Then you need Schaeffler's Smart Ecosystem 4.0. Components equipped with sensors, application-specific solutions, and cloud-based services mean manufacturers and operators of machines and equipment can use and apply the Internet of Things in practice.

At the 2017 Hannover Messe, we will be demonstrating how our new, sensor-equipped components can be integrated into the overall system. For example, the latest

version of the FAG SmartCheck allows you to connect directly to the Schaeffler cloud or communicate with other cloud technologies. The connection between the FAG SmartCheck and the Schaeffler cloud is remarkably easy to make via smartphone, e.g. by scanning the relevant product's QR code or using the free app.

Our new FAG VarioSense bearings are another example, and you can read more about them in the article on the following page.

...AND SO CAN YOU

DIGITAL MONITORING WITH FAG VARIOSENSE BEARINGS

Getting started in digitalization has never been easier: FAG VarioSense bearings — a combination of a standard rolling bearing and a sensor cluster — provide several sensor signals for monitoring machines and processes in one compact unit.

UNIQUE WORLDWIDE

The outstanding advantage of the sensor cluster is that your customer can individually define the number and combination of measured variables. Up to four different sensors can record data at the same time, which at the moment is a unique feature on the market. This solution — which is based on standard FAG bearings that are known for their outstanding mechanical characteristics — integrates several sensor elements into a ring-shaped housing that is just 7 mm high and requires no additional radial design envelope.

FAG VarioSense bearings are universally suitable for use in electric motors and pumps, drives for agricultural and construction machinery, electric vehicles, forklift trucks, and other machinery through to applications in wind turbines and in conveying systems and elevator technology.

START WITH DEEP GROOVE BALL BEARINGS

The new system will initially be introduced for the well-established 6205 to 6210 ranges



▲ FAG's VarioSense bearings offer requirement-based sensor configurations for the simultaneous recording of multiple measured variables

Possible measured variables



Speed



Temperature



Displacement



Angle



Load



Direction of rotation



Vibration

of deep groove ball bearings, which should happen by the start of 2018. Market launch is set to take place with the following functions: Speed, direction of rotation, temperature, and displacement / force. Other bearing types and additional sizes and functions are also currently in development, while the robust prototypes that are already available are waiting to be employed in pilot customers' applications. What is more, FAG's VarioSense bearings with their speed measuring function can be used as a 1-to-1 replacement for competitors' products and promise outstanding characteristics. Why not see for yourself?



BEARINGS 2000

A STRONG LOCAL PARTNER



▲ Bearings 2000 managing directors Michael Stamatiadis and Alex Stamatiadis

Bearings 2000 (Pty) Ltd is a 25-year-old industrial supplies distributor based in Johannesburg, South Africa. The company is the largest independent authorized distributor of FAG and INA bearing products for the Schaeffler Group in South Africa. As an authorized distributor, Bearings 2000 holds extensive stocks of Schaeffler products at all seven branches nationwide and offers the full backing of the Schaeffler Group, including manufacturer warranties, after sales support, guaranteed original products, training programs, engineering services, and condition monitoring and lubrication systems.

Bearings 2000 aims to provide a comprehensive supply solution to create added value for its customers across multiple industries, including engineering, mining, food and beverage, steel, construction, petrochemical, power generation, export, and agricultural, by reducing maintenance costs, increasing production output, and reducing downtimes.

Building on its proud history, with management that combines decades of experience with a dynamic, young,

and well-trained team, the company has embarked on an extensive investment strategy to expand its operations and systems, which resulted in exponential and sustainable growth over the last five years to establish its position as a major player in the industrial supplies sector in South Africa.

Bearings 2000 plans to continue this momentum by increasing market segment penetration, expanding its reach into five new geographic locations by 2020 and diversifying its product lines. This is all backed by Bearings 2000's main objective



▲ Bearings 2000's stock holding of Schaeffler products at its headquarters in Germiston, Johannesburg.

to provide industry-leading service through its three core strengths:

FRICTIONLESS SUPPLY FLOW

Actively developing and introducing systems and processes to reduce the "friction points" from when a product is ordered to when it reaches the customer.

TECHNOLOGY AS ROCKET FUEL

Bearings 2000 embraces ever-developing new technologies to provide rocket fuel to propel its customer service processes and create a frictionless buying experience. Examples include a fully barcoded and digital warehouse management system, an online business-to-business customer service and sales platform, mobile CRM systems, and integrated systems with logistics partners.

PEOPLE

Cultivating a culture of getting things done, openness, embracing change, and being open to new ways of performing old processes with an emphasis on personal development is how the team stay on top of their game. Bearings 2000's people embody, develop, and own these values to deliver what their customers need.



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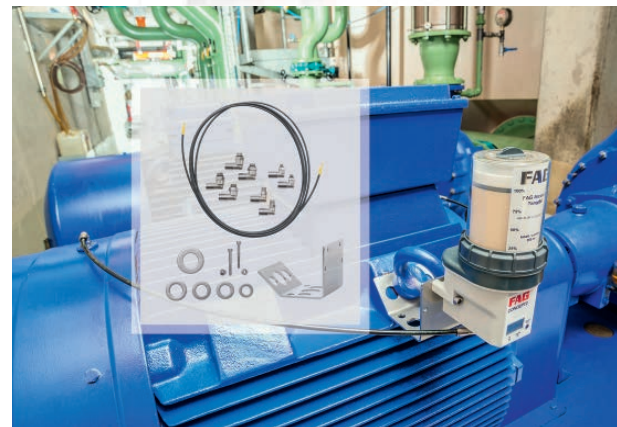
▲ HOT OFF THE PRESS: NEW IS1

This year's Hannover Messe saw the publication of the new IS1 catalog. It provides a thorough insight into Schaeffler's current range of industrial products for mounting, repairing, maintaining, and dismounting rolling bearings and thus replaces the previous version, which has also proven itself to be a reliable companion. The previous catalog includes numerous product versions that are no longer available. The extensive portfolio updates that Schaeffler carried out at the end of 2016 are also included in the new IS1 ("Mounting and Maintenance of Rolling Bearings"). New additions to the catalog include the HEATER, HYDNUIT, and SmartQB products.



▲ FAST CONVERSION TO AUTOMATIC LUBRICATION

The FAG CONCEPT2 automatic relubricating device is the perfect solution for the individual lubrication of two bearing positions in electric motors, fans, and compressors. We now offer a complete "E KIT" system specifically developed for retrofitting on electric motors. In addition to the FAG CONCEPT2 lubricator, this also includes all of the components needed to mount it (lubricant hoses, retaining brackets, and a small parts kit). The changeover from manual to fully automatic lubrication can thus be made quickly. Our E KIT is ideal for both original equipment and retrofitting, and is available at a very reasonable price.



▲ "E" for electric motor: Fast conversion with the E KIT for the FAG CONCEPT2 lubricator

▲ RESPONSIBILITY FOR TOMORROW

In mid-May of this year, Schaeffler published its first sustainability report, which provides comprehensive information about the targets and measures that made up our sustainability strategy during the 2016 financial year. The report shows the ecological, economic, and social issues that affect us and the ways in which we handle them. 24 topics of particular relevance are presented (taking account of the central interest groups) and a detailed report on each of these topics is given across the four fields of activity: "Sustainable Management", "Customers and Products", "Environment and Energy", and "Employees and Society". The report is available online and as a printed document.



You can find the complete 2016 sustainability report on our corporate website at:
www.schaeffler.com/sustainability



BEARINX-online Easy Pump

BEARINX is a leading calculation software program from Schaeffler. Our new BEARINX-online “Easy Pump” module lets you easily calculate bearing supports for fluid pumps and select the ideal bearings for the application. The program features self-explanatory menu navigation. Easy Pump has access to the INA/FAG bearing database. The detailed internal geometry is used when designing cylindrical roller, ball, and angular contact ball bearings. In addition to a precise bearing design, parameters such as the function of the seals can also be checked by inspecting the displacement at the seal positions.

BEARINX-online Easy Pump is available online and can be used free of charge. The initial registration process is quick, so you can get started straight away once it has been completed.

<http://bearinx-online-easy-pump.schaeffler.com>



FAG

SCHAEFFLER