

SCHAEFFLER



FAG

INMOTION

ISSUE 12 - Oct 2014

Formula E victory in Beijing...

Schaeffler and the ABT Sportsline team win the inaugural Formula E ePrix in Beijing



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▲ Richard Hall - President Industrial and Deputy Managing Director Schaeffler UK

RICHARD HALL PROMOTED TO PRESIDENT INDUSTRIAL AND DEPUTY MANAGING DIRECTOR AT SCHAEFFLER UK

Richard effectively takes over Kate Hartigan's President Industrial responsibilities following her retirement in 2013. Richard, who held the position of Vice President Automotive at Schaeffler UK from 2007 to 2013, is now also promoted to Deputy Managing Director, Schaeffler (UK) Ltd.

Richard joined Schaeffler in 1995 and has managed sales, marketing, engineering, customer services and logistics functions in both the Industrial

and Automotive Sales divisions. He has a BEng (Hons) Degree in Manufacturing Engineering and Business Studies from Coventry University and an MBA from Warwick Business School. In his new role as President Industrial UK & Ireland, Richard will report to Mr. Uwe Hartmann, Senior Vice President Industrial Sales Europe, Middle East and Africa.

Richard Hall commented: "I am really excited to be taking on the responsibility for Schaeffler's Industrial business for the UK and Ireland region.

We have an industry leading product portfolio of rolling bearings, plain bearings and linear systems, backed up with a wide range of condition monitoring and maintenance solutions. Based on a solid foundation of technological leadership and strong customer relationships, we have a real opportunity to take the Industrial Division further in both our growing Industrial Aftermarket business and also a number of key OEM sectors."

ALENA USEINOVIC APPOINTED VICE PRESIDENT AUTOMOTIVE

ALENA USEINOVIC HAS BEEN APPOINTED AS VICE PRESIDENT AUTOMOTIVE AT SCHAEFFLER UK, TAKING OVER DUTIES AND RESPONSIBILITIES FROM RICHARD HALL.

In the last 10 years, Alena has held various sales and business development roles for a world-leading automotive Tier One supplier. Based in both Germany and the UK, Alena gained valuable experience by working closely with customers such as Ford, BMW, GM and Mercedes. Alena has a Degree in International Business Management from Cardiff University.

Alena commented: "Moving to Schaeffler is a very exciting career move for me. The company has a strong pedigree and excellent reputation in the automotive market, as well as being a prolific developer of innovative products. Schaeffler is continuously developing new lightweight, lower friction, more energy-efficient components and systems for vehicle transmissions. This is helping to reduce the weight of the vehicle, improve fuel consumption and minimise CO₂ emissions in order to help OEMs meet ever-tighter European vehicle emissions targets.



▲ Alena Useinovic

"Innovation and collaborative working with vehicle manufacturers is critical and with the UK automotive sector showing very positive signs of growth, I look forward to helping Schaeffler UK further develop its automotive business with both existing and new customers," she added.

Richard Hall commented: "I am really proud of the UK Automotive team and the business that we have developed over the past six years. I am confident that Alena's appointment will help Schaeffler UK further strengthen its relationships with our OEM and Tier One customers."

SCHAEFFLER UK RECEIVES 2013 SUPPLIER OF THE YEAR AWARD FROM IADA

SCHAEFFLER (UK) LTD HAS RECEIVED THE 2013 'SUPPLIER OF THE YEAR AWARD' FROM IADA, THE INDEPENDENT AUTHORISED DISTRIBUTOR ALLIANCE. THE ANNUAL AWARD IS VOTED FOR BY IADA MEMBERS AND IS BASED ON CUSTOMER SERVICE, RELIABILITY, QUALITY AND RANGE OF PRODUCTS, DELIVERY AND OVERALL BUSINESS PERFORMANCE.

Richard Hall, President Industrial for the UK & Ireland and Deputy Managing Director at Schaeffler UK, received the award on behalf of his team. He commented: "To receive the Best Supplier award from IADA for the second consecutive year is a tremendous achievement. The award recognises the commitment and enthusiasm of all our staff in supporting the successful growth of the IADA members. We will continue to work hard and build on our excellent relationship with IADA."

James Gibson, IADA Marketing Director, who presented the award to Richard Hall stated: "All the staff at Schaeffler UK thoroughly deserve this award, as they have once again shown extremely high levels of commitment to IADA and its members by providing the very best levels of service and support in all areas."

IADA was formed in 1998 by a select group of independent distributors, with the aim of becoming a nationally networked supplier of MRO supply solutions. The organisation looks for ways to improve the level of service and coverage for their customers and today has 20 members and operates



▲ James Gibson, IADA Marketing Director, (left) and Richard Hall - President Industrial and Deputy Managing Director Schaeffler UK

across 50 branches throughout the UK. Key to the success of IADA is providing locally available stocks and expert technical support. In addition, IADA is working hard to gain new national supply contracts for MRO products and has appointed a dedicated team working on behalf of the members.

YOUNG ENGINEER WINS NATIONAL PRIZE WITH PHONE CHARGER FOR CYCLISTS

MATTHEW HUNTER, FORMERLY A STUDENT AT CHIPPING SODBURY SPECIALIST TECHNOLOGY SCHOOL IN BRISTOL HAS WON THE YOUNG ENGINEERS' DUKE OF YORK AWARD (ROSE BOWL) AND £1,000 PRIZE MONEY FOR 'CREATIVE USE OF TECHNOLOGY'.

Matthew received the Award at The Big Bang UK Young Scientists & Engineers Fair at the NEC, Birmingham in March. Matthew's winning device, the Cygen is designed to charge a mobile phone while cycling, without the cyclist having to worry about the phone battery going flat, resulting in loss of satnav capability and the risk of then getting lost.

The core of Matthew's product is an axial gap brushless generator with a ring of magnets attached to the spokes. The device is designed to be totally non-contact, which means that there is no residual drag when the phone is not charging. Matthew first came up with the idea while studying for his A Levels. During his work placement at Renishaw, Matthew was able to part-develop the Cygen device. This device became the

core of Matthew's A-Level Engineering and Technology (ET) Project. Renishaw also helped to manufacture a product prototype.

"I completed the ET Project at school and then decided to enter the project in



▲ Matthew and HRH the Duke of York



▲ Matthew receives the award from engineer and TV presenter Kate Bellingham (left) and Karen Preston from sponsor Schaeffler UK.

the regional [West Midlands] Big Bang Fair awards, which I ended up winning. This meant I could progress to the National Big Bang finals at the NEC and benefit from the Young Engineers' mentoring scheme," says Matthew.

Rod Edwards, Chief Executive of the Young Engineers charity, says: "I was delighted to see Matthew Hunter win this prestigious award. It was very rewarding to see Matthew show his work to the Duke of York and then go on to be presented with the Rose Bowl. Young Engineers receives no direct Government funding and only exists through the generosity of donors and sponsors like Renishaw and Schaeffler. Last year over 20,000 young people received hands-on practical engineering experience from Young Engineers in schools and clubs around the country, and none of this would be possible without this financial support"

SUPPORTING THE NEXT GENERATION OF UK ENGINEERING TALENT

SCHAEFFLER UK WAS ANNOUNCED AS 'BEST COMPANY' IN THE PATHWAY TO APPRENTICESHIP (PTA) AWARDS 2013, IN RECOGNITION OF THE COMPANY'S ONGOING SUPPORT AND COMMITMENT TO THE PROGRAMME.

Working in partnership with SEMTA and Further Education Colleges, the Welsh Government introduced the PTA programme in 2009. The scheme is a chance for young people to learn skills and gain vital work experience, while giving employers an in-depth look at potential entrants to their industry.

The PTA Awards, which are organised by SEMTA, are part of the annual Engineering Employers Federation (EEF) Future Manufacturing Awards. Neil Walters, Production Support Manager at Schaeffler UK, received the Best Company Award on behalf of the company. He commented: "Pathway to Apprenticeships is a fantastic scheme and we are therefore delighted to have won the Best Company Award this year. As a manufacturer of automotive engine components, Schaeffler UK has always recognised the importance of investing in its people. It is essential that we have a highly skilled workforce, and apprentice programmes

play a major part in meeting this need." Established in 1955, the Schaeffler plant in Llanelli manufactures high precision engine components for the automotive market. The plant currently employs 260 people and is an autonomous subsidiary of Schaeffler.

Adrian Roberts, Director of Human Resources at Schaeffler UK added: "As a company, we have always recognised that a continuous flow of new engineering apprentices into the business is critical to the ongoing success of our manufacturing plant in Llanelli. Taking on apprentices each year enables us to continually develop the pool of talent and skills that we have here. Developing strong links with our local college, Coleg Sir Gar, has played a significant part in this successful programme, giving selected youngsters a real taste of manufacturing."

Bill Peaper, National Manager - Wales at SEMTA commented: "The Pathway to Apprenticeship programme has been running since 2009.



▲ Left to right: Bill Peaper, National Manager Wales, SEMTA; Neil Walters, Production Support Manager, Schaeffler UK; Paul Byard, National Director, EEF Wales.

The awards recognise the hard work of the apprentices, companies and colleges in delivering this quality programme.

All engineering colleges across Wales are involved in nominations for the Best Company and Best Learner awards categories. These nominations include supporting evidence of why the companies and learners [apprentices] have been nominated. The nominations are then judged and shortlisted to three finalists per category, who are then invited to the awards ceremony. Schaeffler UK's production plant in Llanelli is now recognised as one of the leading lights in Wales in terms of the models and techniques it uses to train apprentices."

SCHAEFFLER UK AWARDED TECHNOLOGY CENTRE STATUS FOR LOCAL ENGINEERING EXPERTISE

AS PART OF THE SCHAEFFLER GLOBAL TECHNOLOGY NETWORK, SCHAEFFLER (UK) LTD HAS BEEN CERTIFIED AS A SCHAEFFLER TECHNOLOGY CENTRE (STC).

STCs are local centres of technical expertise in different regions of the world. With highly qualified engineers and a defined range of services, this means Schaeffler is pursuing its target of offering the same high standards of customer support all over the world.

Awarding the "Schaeffler Technology Centre" status is confirmation that, following a comprehensive audit, these high demands are being met. For more information about the Schaeffler Global Technology Network please visit: www.global-technology-network.com

Schaeffler sales staff and engineers in local Schaeffler Technology Centres form a strong team. In the regions, they bring Schaeffler's engineering and service knowledge even closer to the customer and enable technical issues to be addressed in the most effective way possible and within an optimum timescale.

Left to right: Karl-Heinz Lindner - Vice President Technical Office, Uwe Hartmann - Senior Vice President Sales Industrial, Richard Hall - President Industrial and Deputy Managing Director Schaeffler UK and Robert Schullian - President Sales Industrial.



Expert advice and support is available for all aspects of rolling bearing technology including application engineering, calculations, manufacturing processes, lubrication, mounting services, condition monitoring and installation consulting to deliver customised rolling bearing solutions to uniformly high quality standards throughout the world.

Internal audits, regular training courses, workshops and follow-up audits ensure that Schaeffler Technology Centres achieve and maintain these high standards.

Furthermore, STCs constantly share information and ideas across a worldwide network of experts within the Global Technology Network.

If more in-depth specialist knowledge is required, these networks ensure highly qualified support is provided quickly – irrespective of where it is needed in the world.

This technical collaboration between members of the Global Technology Network results in tangible benefits for Schaeffler customers. Customer projects that demonstrate definitive cost savings are clearly documented as Global Technology Solutions.



NEW TECHNICAL POCKET GUIDE AND SMARTPHONE APP FROM SCHAEFFLER

SCHAEFFLER HAS PUBLISHED A NEW 700-PAGE TECHNICAL POCKET GUIDE FOR THE UK MARKET. THE PUBLICATION IS FREE-OF-CHARGE AND IS AVAILABLE IN EITHER PRINTED HARD COPY FORMAT OR AS AN APPLE/ANDROID APP.

Schaeffler's Technical Pocket Guide is a useful technical reference book for mechanical engineers, technicians, apprentices and students across numerous technical and scientific disciplines.

Practical and easy-to-use, the Guide is intended as an educational tool that becomes a trusted companion for many people in their day-to-day work.

pneumatics, mechatronics, tolerances and fits, construction materials and components.

The user-friendly Guide bridges the gap between a comprehensive textbook and purely tabular data. The Contents section is displayed in a logical manner and even complex information is explained clearly and concisely.

The book comprises 14 colour-coded chapters for easy navigation. There are numerous diagrams and drawings, well-structured texts, tables and formulae, allowing the reader to quickly find what he or she is looking for.

Dr Steve Lacey, Engineering Manager at Schaeffler UK commented: "The Technical Pocket Guide is the perfect desktop companion and aide memoire for anyone involved in engineering, from students and apprentices at the beginning of their careers, right through to experienced mechanical engineers, chief designers and technical directors."

The Guide had specialist support from Prof. Dr-Ing. Harald Meerkamm, former head of the Chair for Engineering Design at the Friedrich-Alexander University of Erlangen-Nuremberg.

His technical and teaching experience enabled the entire content of the Guide to be carefully revised and updated.

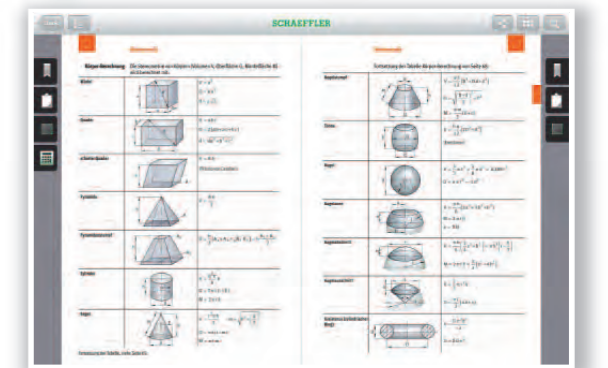
Schaeffler also offers the Technical Pocket Guide as a software App, providing a mobile reference guide.

In addition to the content of the printed version, the mobile App also includes useful 'search' and 'bookmark' functions, as well as information about Schaeffler.

A sharing function enables specific text passages to be shared via e-mail, Facebook, Twitter and Google+.



The Guide covers a variety of technical subjects including units of measurement, mathematics, statistics, physics and chemistry, as well as specialist subjects such as mechanics, acoustics, hydraulics and



THE POCKET GUIDE IS AVAILABLE FREE OF CHARGE

For your copy of the Technical Pocket Guide, please call Schaeffler UK's Marketing Department on 0121 313 5870 or email info.uk@schaeffler.com



GWYR SCHOOL WINS ITS EIGHTH EESW AWARD FOR COOLING TOWER PROJECT AT SCHAEFFLER UK

THE TEAM FROM YSGOL GYFUN GWYR SCHOOL IN GOWERTON, SWANSEA WON THE 'AIRBUS AWARD FOR BEST INNOVATIVE OR ADAPTIVE DESIGN' FROM THE ENGINEERING EDUCATION SCHEME WALES (EESW).

This is the eighth year that Gwyr has won an EESW award working with Schaeffler UK. One of the EESW judges this year described the school's project as "the best project I've seen in four years of judging." Schaeffler's manufacturing plant acts as an EESW 'link' company and so each year devotes time and resources to advising students on their projects. The EESW scheme operates through local companies such as Schaeffler, who set teams of A-Level students projects relating to actual industrial problems. Over a period of six months, the students work to solve these challenges by cooperating with engineers from the link company.



▲ Schaeffler worked with a team of eight students: Nerys Griffith, Fynn Bishop-Guest, Iwan Cole, Tom Francis, Gareth Goss, Aled Rees, Katherine Rees and Christian Stobbs. Also pictured are Rhys Browning of Ysgol Gyfun Gwyr School (left) and Derrick Lewis of Schaeffler UK (right).

"This year we did things a little differently," explains Derrick Lewis, Technical Manager at Schaeffler UK and contact for EESW projects. "We decided to give the students a one-day on-site training course that included project management tools and techniques, a problem-solving exercise, followed by a 'MOVE' [a continuous improvement programme] challenge, where the students helped to streamline workflows and eliminate waste in production areas at the plant."

The students were invited back the following week, when they were presented with a selection of five possible projects to choose from. The team was asked to discuss which of these projects appealed to them and why. "Allowing students to choose the problem they wanted to solve gave them ownership of the project," explains Lewis.

The team chose to tackle a problem involving detection and treatment of bacteria in cooling towers at the plant. Current detection methods involve a technician using agar-coated dip slides and immersing these in water from the cooling towers. These slides are then incubated for 48 hours, after which the bacteria levels are checked. This method is time consuming and costly. "Thanks to the time spent at the plant learning about the specific tools and techniques, we knew how to develop our ideas into our working prototype," states team captain Nerys Griffith.

"Derrick ensured that we spent time writing an accurate and concise statement of requirements using SMART [Specific, Measurable, Achievable, Realistic, Timely] objectives, which made it easier for me as team captain to monitor our progress throughout the project."

The team's solution involves using a sensor system that measures the turbidity and attenuation of a water sample. The sensors are connected to a Raspberry Pi computer, which compares light levels to known calibrated results. From the analysis completed, a determination is made regarding the bacteria level in the sample. If this indicates that bacteria are present at a higher level than the planned threshold, the water is then treated with biocide. A status panel shows if the water is being treated, or if biocide levels become low. Failsafe alarms are also written into the system.

A working model was demonstrated to senior staff at Schaeffler UK before being presented at the EESW's annual South Wales awards ceremony held at The Celtic Manor Resort, Newport.

"We are extremely happy to win this award," says Rhys Browning, Head of Physics at Ysgol Gyfun Gwyr School. "We'd like to thank Derrick Lewis and his team for their continued support. The valuable experience and skills learnt during the competition will aid the pupils in their chosen career pathways." ■

'MAKING KNEXIONS'

Schaeffler UK recently supported a 'Making Knexions' challenge at Morrision Comprehensive School in Swansea. The event was supported by Nigel Moore of Young Engineers, Liz James from BaseWales, and Paul Griffiths from the Technology Department at Schaeffler UK.

11-12 year old pupils were given the task of designing and testing a wind turbine constructed from paper card and the popular building system, K'NEX®. As Paul Griffiths recalls: "Confused faces quickly turned into enthusiastic ones as the pupils got to grips with the task and wanted their team to produce the best result!"



Each team was judged on the output of their wind turbine, the cost of construction and how well they worked together as a team. According to Griffiths, form tutor Paul McNeil found the session "very worthwhile" and has asked for a repeat event in the next year. The aim of the event was to create a stronger link between real-world engineers and the local primary school, which says Griffiths "was certainly achieved, and hopefully we've enthused some pupils into becoming engineers in years to come."



NEW PLUMMER BLOCK HOUSING INCREASES BEARING OPERATING LIFE BY UP TO 50%

SCHAEFFLER HAS DEVELOPED A NEW PLUMMER BLOCK HOUSING FOR SPHERICAL ROLLER BEARINGS, WHICH INCREASES THE OPERATING LIFE OF THE BEARINGS BY UP TO 50% COMPARED TO CONVENTIONAL PLUMMER BLOCK HOUSINGS.

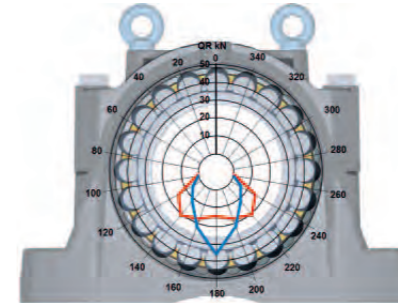
The new FAG SNS plummer block housing has been completely redesigned, providing numerous technical advantages to users, including more even load distribution on the bearings, resulting in an extended operating life. Schaeffler has also optimised the design further, resulting in a housing that is not only more cost effective to manufacture, but also easier to mount and dismount. Manufactured from high quality, spheroidal graphite cast iron, the housing ensures a high level of robustness and operational reliability. Other benefits include improved lubrication and condition monitoring of the bearings, as well as increased application flexibility and a significant reduction in overall cost of ownership. Due to the introduction of new, industry-standard mounting arrangements and dimensions, the housing can also be installed as a direct replacement for a wide variety of conventional plummer block housings.

Housing design minimises bearing load

The unique, patented design of the FAG SNS plummer block housing distributes the load on the bearings more effectively (uniformly) than previous and alternative housings.

Using its in-house developed bearing design, calculation and simulation software, Bearinx®, Schaeffler is able to analyse different housing designs with various combinations of bearings, enabling the optimisation of the complete system (i.e. housing and bearings). By introducing some subtle geometrical changes, including a small arch-shaped cutaway at the bottom centre of the housing, the load on the bottom roller (at the apex, 180 degrees) is now distributed more evenly across two or three rollers. By spreading the load from the shaft across a greater number of rolling elements, the operating life of the bearing is increased by up to 50%.

In Fig 1, the blue curve represents the rolling element load on a bearing installed in a housing with conventional support. The red curve represents the same load but in a bearing installed in the SNS housing with a cutaway. The red curve has a wider load zone and more even load distribution than the blue curve. In addition, the load on the roller at the apex is significantly higher in the blue curve. However, the red curve demonstrates that a cutaway in the feet of the housing creates a wider load zone. The maximum load from the shaft is no longer supported by the roller at the apex, but by its two neighbouring rollers.



▲ Fig 1.

Design improvements reduce lifecycle costs

Other design changes have resulted in improved bearing lubrication, mounting and condition monitoring – which together contribute to a significant reduction in the Total Cost of Ownership (TCO). A lubrication bore with a longer groove has now been added to the inside of the upper section of the housing. This means that different bearing types installed in each bearing position can now be supplied with sufficient lubricant at all times.

To enable improved condition monitoring of the bearings, connections are now provided on both sides of the housing as standard for Schaeffler's FAG SmartCheck condition monitoring device.

Schaeffler can also supply the housing with connections for its new Concept 8 automatic lubrication system.

Flexible and cost-effective

Bevels, small surfaces and an upper housing section that covers the lower housing section, eliminate potential collection points for fluid and contaminants. A variety of seals are available, which enable the bearings to operate in harsh environments such as mining, quarrying, mineral processing, food and beverage processing.

Rolling bearings of different diameters and widths can be installed in the new SNS plummer block housing.

The bearings are movable and so function as non-locating bearings. Suitable bearings include the 222, 223, 230, 231, 232, and 240 series. The FAG SNS housings can be used as direct replacements for a wide range of conventional housings.

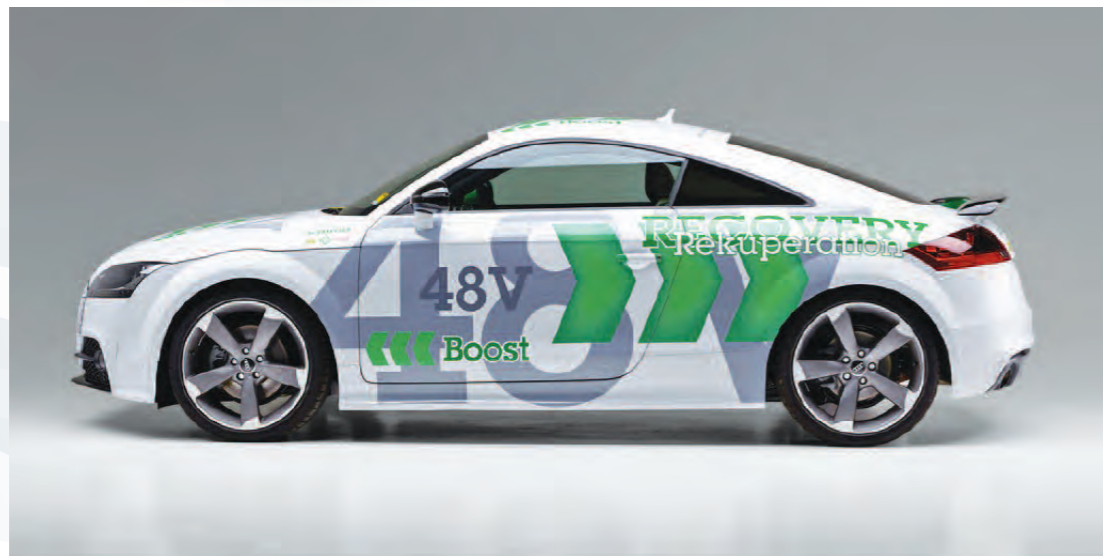


▼ FAG SNS Plummer Block

NEW SCHAEFFLER UNVEILS COMPACT 48V ELECTRIC DRIVE MODULE FOR HYBRID ELECTRIC VEHICLES



BEARINGS AND AUTOMOTIVE COMPONENT AND SYSTEMS SUPPLIER SCHAEFFLER HAS DEVELOPED A RANGE OF INNOVATIVE SYSTEMS FOR FUTURE PASSENGER VEHICLES EQUIPPED WITH ON BOARD HIGH-PERFORMANCE.

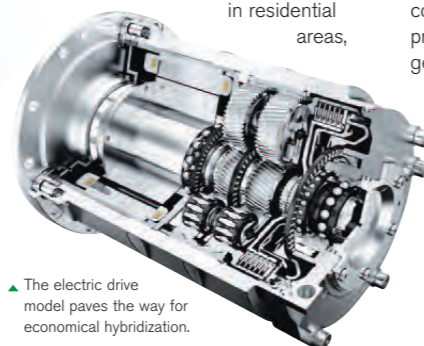


The core element of this range is a compact 48V electric drive module that includes a clutch and planetary transmission, which can be placed either on the front or the rear axle of the vehicle.

The drive module paves the way for the economical hybridisation of vehicles. The low-voltage design reduces costs compared to high-voltage solutions with their associated requirements. This economical hybridisation allows significant advances to be made in terms of increased drive efficiency, as the use of a 48V electric system opens up operational possibilities that were previously the exclusive domain of vehicles equipped with high-voltage hybrid components, including "crawling" in traffic jams – electrically powered driving in dense inner-city traffic, i.e. moving off, driving at low speeds, and parking using electric power. In addition to electric 'boosting'

during starting and electric 'sailing' – a driving mode in which the electric motor ensures constant speed while the internal combustion engine is switched off – the system also enables recovery and storage of energy during deceleration, which is key in terms of reducing fuel consumption.

The electric drive, which has an output of up to 12kW, acts as the hybrid vehicle's sole source of power when "crawling" in stop-and-go traffic. The electrically generated propulsion of Schaeffler's 48V drive module is also sufficient for driving in residential areas,



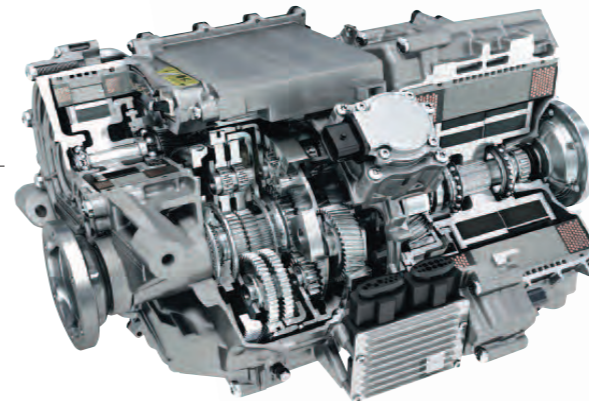
▲ The electric drive model paves the way for economical hybridization.

parking in garages and for other low speed driving situations, for example, when moving off from traffic lights.

The high performance of the 48V system also means that the drive element opens up new potential for energy recovery. Due to the higher recuperation capability, the kinetic energy released during deceleration is now no longer converted into heat that subsequently dissipates – as was previously the norm – but is instead fed back into the onboard electric system in the form of electrical energy. Therefore, a hybrid solution with combustion engine and 48V system proves to be advantageous when generating electricity from braking energy.

"Using a 48-volt solution today makes it possible to achieve outputs of up to twelve kilowatts," summarises Prof. Peter Gutzmer, CTO at Schaeffler.

▼ 48V Drive train



"This entry-level form of hybridisation therefore already offers the essential advantages of a hybrid vehicle while simultaneously providing an economically attractive, low-cost option that allows CO2 emissions to be reduced by up to 15 per cent."

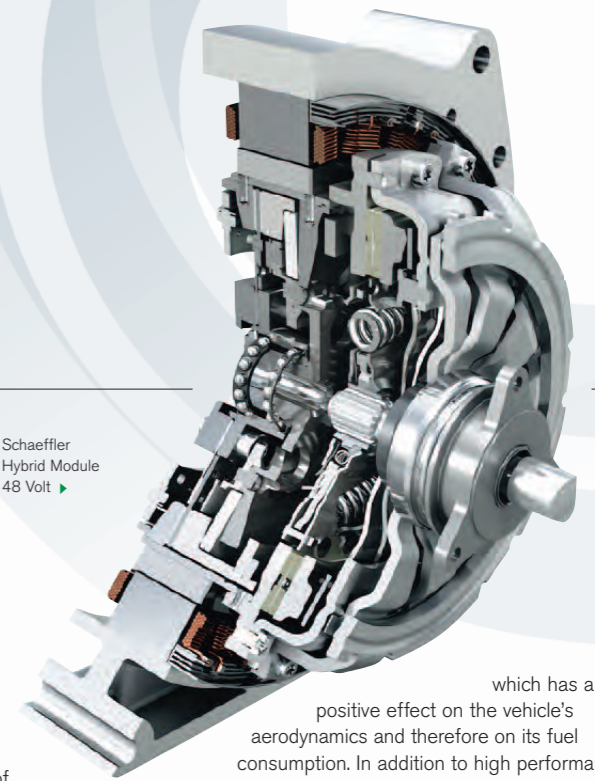
"The fact that the drive unit is connected directly to the prop shaft in rear-wheel drive vehicles prevents drag losses by the internal combustion engine. We can therefore achieve maximum efficiency and enable driving situations that were previously only offered by hybrid vehicles with significantly more complex designs," explains Dr. Tomas Smetana, Vice President Product Group Electric Axle Systems at Schaeffler. "Our combination of an electric motor and transmission also allows the flow of force to be distributed selectively, drive torques can be superimposed, and even torque vectoring – the variable distribution of torque that

serves to increase driving safety – is possible."

In its current configuration, the cylindrical component of the drive module is 235mm in length with a diameter of 165mm. This compact design means that the module can easily be integrated into the drive train and overall design of the vehicle without any space having to be sacrificed by the boot space or fuel tank.

Vehicle manufacturers that decide to install a second low-voltage on-board electric system (48V in addition to the standard 12V system) can also integrate other suitable high-performance innovations into the vehicle. These include high-performance, rapid-reaction actuators for the chassis. These allow the ground clearance to be regulated according to the driving conditions and terrain,

Schaeffler Hybrid Module 48 Volt ▶



which has a positive effect on the vehicle's aerodynamics and therefore on its fuel consumption. In addition to high performance due to the higher voltage range, a second on-board electric system also offers the advantage of smaller cable cross-sections. This reduces weight and facilitates the integration and installation of the cable harnesses in the vehicle.

A range of other functions that push today's standard 12V systems to their performance limit can now be practically integrated into the architecture of a 48V system. These range from mechanical tensioners for 48V belt-driven starter generators, to a number of electromechanical adjusters for clutch, steering, roll stabilisation, self-levelling suspension, hybrid modules, axle drive solutions and electromechanical torque vectoring units.

NEW SCHAEFFLER WORK WITH PORSCHE ON HYBRID SPORTS CAR FOR LE MANS

SCHAEFFLER HAS ANNOUNCED THAT IT WILL WORK WITH PORSCHE ON ITS NEW HYBRID LMP1 SPORTS CAR, WHICH WILL COMPETE AT THE FIA WORLD ENDURANCE CHAMPIONSHIP (WEC).



▲ Handshake of the Chief Technology Officers: Wolfgang Hatz (Porsche) and Prof. Peter Gutzmer (Schaeffler)

2014 marks the beginning of a new era in sports car racing. Not only does this year see the return of Porsche, but also, for the first time, new technical regulations come into effect for the global racing series. These regulations limit the useable amount of energy but allow considerable freedom in

the areas of hybrid and powertrain technology – and so pose new challenges to entrants. Unlike F1 various engine concepts are permitted. This makes WEC the perfect stage for manufacturers and suppliers to demonstrate their expertise.

"In the new regulations of the FIA World Endurance Championship, energy efficiency and forward-thinking technology play a crucial role.

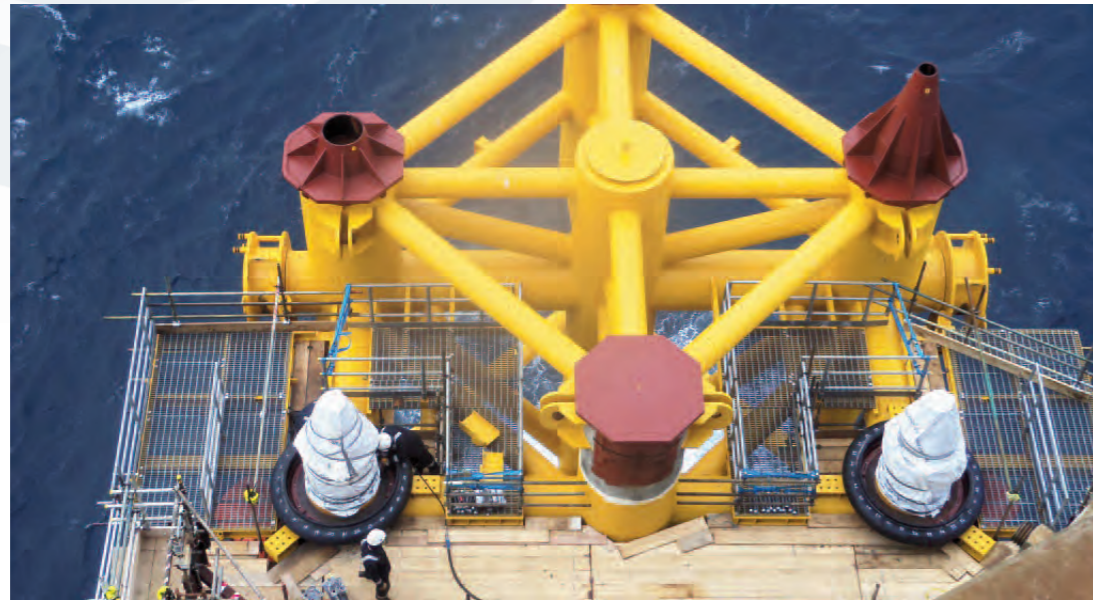
These are also the areas that Schaeffler is focusing on for automotive technology. The parallels between motorsport and production make WEC and the cooperation with Porsche an ideal platform for Schaeffler," said Prof. Peter Gutzmer, Chief Technology Officer at Schaeffler.

Porsche and Schaeffler have been working together for decades. The legendary 917, with which Porsche clinched its first two overall victories at Le Mans in 1970/71, was a development prototype for Schaeffler's hydraulic valve train components.



CUSTOM BEARINGS HELP MAXIMISE GAS RECOVERY FOR A NORTH SEA OIL AND GAS MAJOR

SCHAEFFLER UK HAS CUSTOM DESIGNED A SET OF MAINTENANCE-FREE SPHERICAL PLAIN BEARINGS TO SUPPORT A NEWLY CONSTRUCTED PROCESS MODULE EXTENSION COLUMN, WHICH IS FIXED TO THE MAIN OFFSHORE PLATFORM LOCATED IN THE NORTH SEA.



▲ Preparation for installation of sleeves and bearings

The function of the bearings is to provide a flexible support between the mono column and main rig allowing for movement of the column caused by waves and tidal current relative to the main rig.

The bearings, which have a bore diameter of one metre, are designed to transfer these loads from the column to the main rig. Chris Head, Application Engineer at Schaeffler UK commented: "After several meetings with the customer and its main contractor for the extension column, it was clear to us that the customer would require a unique design of bearing that offered both a very high level of reliability and zero maintenance."

"We therefore proposed Schaeffler's range of ELGES spherical plain bearings, but customised with extra sealing features and low friction sliding layers. These would ensure maximum reliability and zero maintenance."

Schaeffler's standard ELGES spherical plain bearing is fitted with only one seal on each side of the bearing, so a special sealing arrangement was discussed with the customer. The custom bearings are therefore fitted with additional seals and designed with an extra sliding layer in the bore.

This ensures low friction when the extension column moves relative to the main rig due to the ocean waves.

As Chris Head states: "We offered additional sealing features in the form of a grease layer, which would allow us to lubricate the outermost lip seal, added a special seal, which acts as a barrier for the grease, with another seal to prevent the grease from contaminating the bearing sliding layer."

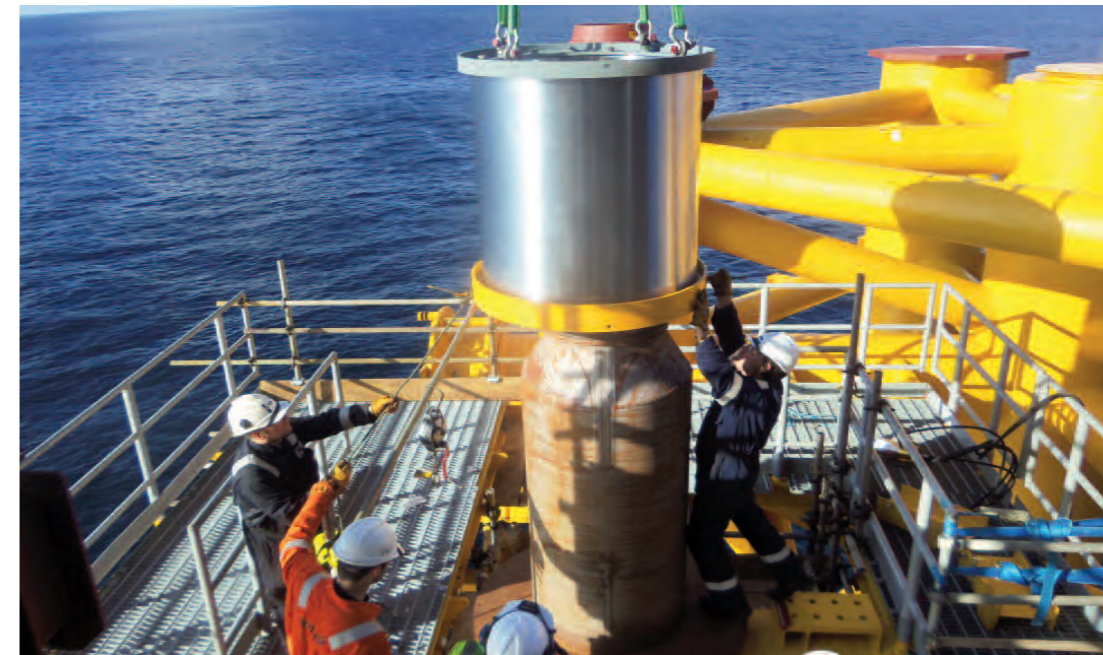
The bearings were manufactured according to strict customer specifications, with all bearing materials, components, manufacturing and quality processes all fully traceable.



Chris Head
STC Applications
Engineer,
Schaeffler UK



▲ Elges Spherical plain bearing



▲ Installing sleeve onto column prior to grouting



▲ Alan Stewart, Regional Sales Manager North, Schaeffler UK

The bearings were installed on the offshore platform extension column in May 2013, and in order to ensure that the installation of the bearings could proceed without difficulty under the challenging and constricted conditions present on an offshore platform, an installation trial was carried out. This was performed by two experienced fitters from Schaeffler and allowed important details and the special tools required for offshore installation to be included in the work planning. Thanks to Schaeffler's Global Technology Network, the service personnel were extremely well prepared, having been brought into the project planning and implementation process at an early stage by the sales and application engineering functions.

The customer was so impressed by the professional skills displayed during the installation trial that he requested a Schaeffler fitter be present when the preliminary work was carried out on the platform, in order to support the other companies involved and to monitor their work operations.

Alan Stewart, Regional Sales Manager North at Schaeffler UK commented: "This is a first for the oil and gas sector. This project is the first one in which a process module extension column of this type is supported by bearings. The customer deemed the bearings to be a high priority on this

project, as their function is absolutely critical in supporting the extension column."

He continues: "We were informed by the customer that we won this business due to our technical knowledge and expertise, and because we understood exactly what the customer required. As the bearing supplier, we successfully met all of our deadlines, helped enormously by excellent cooperation between the three main parties involved – the end customer, the construction contractor and Schaeffler."



◀ Preparing to install one sleeve onto the column

NEW

UNIQUE MULTI-POINT LUBRICATOR CATERERS FOR UP TO EIGHT DIFFERENT BEARING POSITIONS

AT MAINTEC 2014, SCHAEFFLER UNVEILED ITS UNIQUE MULTI-POINT LUBRICATOR FOR ROLLING BEARINGS. THE SYSTEM CAN BE ADJUSTED TO PROVIDE FOUR DIFFERENT LUBRICATION VOLUMES TO CATER FOR BEARINGS WITH VARYING LUBRICATION REQUIREMENTS – AN INDUSTRY FIRST.

FAG CONCEPT8 is an innovative, cost effective lubrication system for rolling bearings that ensures a constant, optimum supply of grease to the bearings without the need for manual intervention, particularly if machines are located in difficult-to-access areas or are deemed as critical to the production process.

FAG CONCEPT8 provides up to eight separate lubrication points for dispensing precisely metered quantities of lubricant to rolling bearings. The system can dispense lubricant to rolling bearings in a wide range of industrial applications, including pumps, fans, compressors, gearboxes, electric motors, machine tools, wind turbines, as well as production lines in food and beverage processing plants.

FAG CONCEPT8 is fitted with four pairs of lubrication points (eight in total), which are controlled by four individual dispensing pumps. Unlike other multi-point lubricators on the market, FAG CONCEPT8 enables users to individually control each pump in order to optimise cycle times and volumes of dispensed lubricant (lubricant can also be dispensed in a 'pulsed operation').



This means the system can be adjusted to meet up to four different bearing sizes, each with varying lubrication requirements – an industry first. Rather than having to purchase multiple single point lubricators to cope with different bearing lubrication requirements, users can now buy one FAG CONCEPT8.

FAG CONCEPT8 is also equipped with heated outlets, which ensure reliable dispensing intervals, even at low temperatures when the grease is more viscous. In addition, as the lubricant is stored in a transparent replaceable cartridge, users can easily check the lubricant level, enabling easier fill-level control.

The system is easy-to-use with an integrated LCD user display that provides clear navigation menus and two keypad control buttons for set up and adjustment.

FAG CONCEPT8 operates on Schaeffler's ARCANOL range of lubricants. This range includes 17 different greases, each one developed by Schaeffler application engineers and produced by leading international lubricant manufacturers. These greases therefore provide specific lubrication properties for almost every type of industrial application. ■



NEW

LARGE SIZE, HIGH PERFORMANCE X-LIFE TAPERED ROLLER BEARINGS REDUCE FRICTIONAL TORQUE BY UP TO 50%



THE NEW BEARINGS ARE NOW AVAILABLE IN SIZES UP TO 635MM OUTSIDE DIAMETER (OD). THIS MEANS THAT SCHAEFFLER NOW OFFER CUSTOMERS THE WIDEST RANGE OF HIGH PERFORMANCE TAPERED ROLLER BEARINGS ON THE MARKET TODAY.

FAG tapered roller bearings in X-life quality can achieve a reduction in frictional torque of up to 50% compared to conventional tapered roller bearings. The dynamic load rating (load carrying capacity) of the X-life bearing has increased by 20%, with a resulting minimum 70% improvement in the basic nominal operating life of the bearing.

As well as improving the performance and energy efficiency of the bearing, X-life tapered roller bearings also provide additional benefits in terms of a reduced design envelope, weight and friction. Design engineers can now potentially replace a standard tapered roller bearing with a smaller X-life version, therefore downsizing the system and related components. Alternatively, a standard tapered roller bearing can be replaced with an equivalent sized X-life tapered roller bearing, which will provide improved performance and energy efficiencies.

X-life tapered roller bearings also contribute significantly towards reducing operating, servicing and maintenance costs, particularly with regard to the Total Cost of Ownership (TCO).

Wind turbines, tractors and construction machinery

During the development of the X-life tapered roller bearings, particular attention was paid to achieving high



reliability and minimising friction, particularly in high load applications and those that require rotational accuracy.

This means that manufacturers of hydraulic units or gearboxes (pinion bearing supports) such as those found in wind turbines, agricultural vehicles and construction machinery can now surpass previous performance limits, whilst significantly improving operational safety. In terms of downsizing, the improved characteristics of the X-life bearings mean that the performance of the gearbox is improved, whilst the design envelope remains the same.

The 20% improvement in dynamic load rating and minimum 70% improvement

in basic rating life were achieved by improving the geometry, surface quality, materials, dimensional and running accuracies of the bearings.

The premium bearing material used in the manufacture of the X-life tapered roller bearings is specially adapted to meet the requirements of the rolling bearings and is an important factor in the increased performance of the bearings. The fine grain structure of this material provides high toughness and therefore high resistance to solid contaminants.

In addition, a logarithmic profile was developed for the bearing raceways and the outside surface of the rollers, which compensates for high stress peaks under high loads and any "skewing" that may occur during operation. These optimised surfaces assist in the formation of an elasto-hydrodynamic lubricant film, even at very low operating speeds, which enables the bearings to withstand high loads during start-up. Furthermore, significantly improved dimensional and geometrical tolerances ensure optimum load distribution.

Stress peaks are therefore avoided, which reduces material loading. The frictional torque of the new X-life tapered roller bearings has been reduced by up to 50% compared to conventional products. This is due to high dimensional and running accuracy in conjunction with improved surface topography. The revised contact geometry of the inner ring rib and roller end face also assists with the reduction of friction. As a result, bearing operating temperature has also been reduced by up to 20%.

The new X-life tapered roller bearings are not only more economical, but also result in lower bearing operating temperatures, which in turn, places significantly less strain on the lubricant. This enables maintenance intervals to be extended and results in the bearing operating at reduced noise levels. ■



SCHAEFFLER EXTENDS BALLSCREW DRIVES TO INCLUDE NEW ROLLED VERSION



THE NEW BALLSCREWS COMPLETE SCHAEFFLER'S SCREW DRIVES OFFERING, WHICH NOW INCLUDES BALLSCREW DRIVES (GROUND AND ROLLED), PLANETARY SCREW DRIVES, ROLLER SCREW DRIVES, AS WELL AS A RANGE OF BALLSCREW SUPPORT BEARINGS.

Screw drives are suitable for a variety of machine building, automation, handling and automotive engineering applications. Screw drives comprise a threaded spindle and threaded nut. Due to the rotation of the spindle, the nut moves in a linear manner along the spindle, converting the rotary motion of the drive into linear motion.

A screw drive is rigidly connected to the adjacent construction, providing axial displacement or positioning of the component. Nuts are available in a flanged or cylindrical design and in the form of single or double nuts. Preloaded (double) nuts enable high positional accuracy and rigidity. The thread on the shaft is either rolled or ground.

Selection criteria for screw drives are based on a number of requirements including positional accuracy, rigidity, freedom from clearance/preload, load carrying capacity, speed, basic rating life, frictional torque, smoothness of running, and pitch.

Ballscrew drives

In ballscrew drives, the load is transmitted from the spindle by means of precision, hardened steel balls to the nut. The nut (cylindrical or flanged) has a return system for recirculating the rolling elements. Ballscrew drives are able to offer high load carrying capacities and smooth, uniform running with high efficiency and reliability.

Schaeffler's KGT range of ballscrew drives have a contact angle of 45°. External drive forces induce an axial force, which causes axial deflection as a function of the preload. In the case of preloaded single nuts, the preload is achieved by the introduction of oversize balls, resulting in four-point contact with the raceways.

Double nuts are preloaded by the use of a spacer, which sets the nut in an 'O' arrangement. In this case, the rolling elements are in two-point contact with the raceways.

The KGT series is available in accuracy class T7 (52µm variation over a 300mm

axial travel) as standard, with a class T5 (23µm) option also available. Other tolerances can be supplied in accordance with ISO 3408-3 (DIN 69051).

Temperature, sealing & lubrication

The KGT range of ballscrew drives can be used at operating temperatures from -10°C to +80°C. Ball screw shafts (KGS) are available in diameters from 6mm up to 80mm and in lengths from 900mm up to 7600mm.

Bob Love, Business Development Manager at Schaeffler UK commented: "The new rolled ballscrews are a welcome addition to Schaeffler's range of screw drives. We expect considerable interest from OEMs, machine builders and designers of automation and production handling systems."

In addition to the supply of ballscrews, Schaeffler is also able to offer a range of shaft support bearings, including angular contact ball bearings and hybrid angular contact thrust ball bearings for short stroke ballscrew applications.

JWCI SOLVES CHEESE STORAGE CHALLENGE WITH THE HELP OF TRACK ROLLER GUIDES FROM SCHAEFFLER

JWCI PROCESS ENGINEERING HAS SOLVED A CHEESE STORAGE CHALLENGE FOR ITS CUSTOMER WITH THE HELP OF TRACK ROLLER GUIDANCE SYSTEMS FROM SCHAEFFLER UK.

The tracked storage racking systems, which were designed, manufactured and installed by JWCI, have increased cheese storage capacity at the customer's cold storage facility by more than 70% – without the customer having to expand its existing floor space. John Clarke, Managing Director at JWCI comments: "We had to meet very strict timescales and budgets on this project and so it was important that our suppliers delivered on time and within



budget – both of which I'm pleased to say Schaeffler did. We would therefore have no hesitation in specifying Schaeffler products again in the future," adds John Clarke.

He continues: "Over the last five years or so, JWCI has designed and installed storage racking systems of various designs for cheese producers. The first project involved the design and installation of a relatively small system, designed to fit the existing floor space for a customer. The second project, for a different customer, was installed as a trial racking system. The success of this spawned a third project in 2012, which involved the design and installation of a much larger cheese racking system."

In this third project, the customer – a small UK-based producer of Stilton cheese – needed to increase its production output significantly without having to invest in new cold storage facilities or expand its existing storage floor space. "Unless a solution was found to the storage issue, this could have prevented further growth of the customer's business. We therefore designed a stainless steel tracked racking system that utilised the existing storage space much more effectively, which meant the customer could increase production output significantly without having to invest in new premises or expand its existing cold storage facility," states Clarke.

"We designed, manufactured and installed a fully hygienic tracked racking system that could be easily moved by a single operator, eliminating trip hazards and resulting in a safer working environment," he adds.

The slabs of cheese are stored in temperatures of 10 to 12°C. The storage racks are 3.5 metres high and 18 metres in length and utilise almost all the existing space in the cold storage area – from floor to ceiling.

As and when required, the racks of cheese products can be manually pushed or pulled from storage by simply

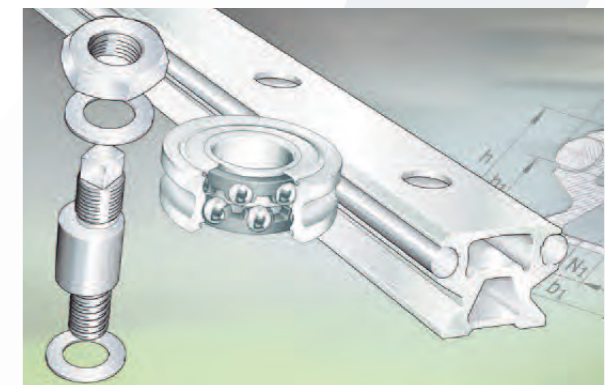


sliding the racks back and forth along the low friction top guide rails – which requires minimal effort.

▲ Tracked storage racking

Essentially, the top guide rails prevent the storage racks from falling over by supporting the loads and ensuring that the racks remain inline at all times.

JWCI designed and built the storage racking systems and assembled these on site in April 2013. For the racking system top rails, JWCI specified a total of 48 x 3-metre long LFS series guideways from Schaeffler, as well as LFR series locating track rollers and bolts.



LFR series locating track rollers are double row angular contact ball bearings that comprise an outer ring with a Gothic arch profile, an inner ring and two ball and cage assemblies. The inner ring and outer ring are made from 100Cr6 rolling bearing steel. The special outer ring provides two-point contact in the contact zone with the raceway. The bearings can support axial forces from both directions, as well as radial forces.

Chris Lait, Regional Sales Engineer at Schaeffler UK commented: "For the cheese storage racks, we custom engineered the track rollers in stainless steel in order to provide maximum corrosion resistance and to protect the guides from frequent washdowns, as well as to withstand the low ambient temperatures in the cool storage facility.

▲ Guideway, track roller and bolt

MONORAIL GUIDE FOR MACHINE TOOLS REDUCES FRICTION BY 40% AND INCLUDES LUBRICATOR

Trends in machine tool development indicate faster cutting speeds are required, as well as increased machining accuracies. Designers of machine tools and other high precision production machinery therefore require components, assemblies and systems that provide suitable levels of stability, precision and dynamics.

At the same time, high precision motion control of machine tools increasingly requires ready-to-fit, complete linear motion systems with integrated features such as sealing and lubrication, specifically matched to the application. In response to these needs, Schaeffler has extended its RUE-E range of linear recirculating

roller bearings and guideway assemblies to include a new size, the RUE25-E, which also offers a range of new integrated features and technical benefits.

For the main axis of machine tools, monorail guidance systems based on recirculating balls and rollers are well proven alongside flat cage units and linear recirculating roller bearings. These systems are ready-to-fit, preloaded and can support loads and forces from all directions. Linear recirculating roller bearing and guideway assemblies of series RUE are primarily used in these applications due to increasingly heavy workpieces, new machining materials and high

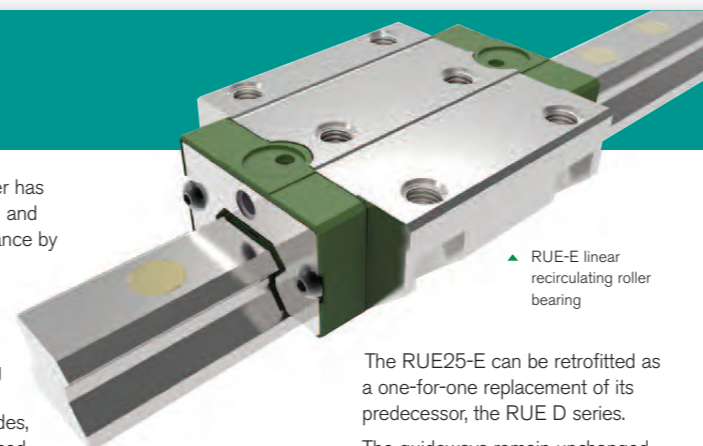
cutting forces. These units offer very high load carrying capacities, greater flexibility and integrated functions.

Schaeffler's RUE25-E maintains numerous proven features from its predecessor, the RUE-D series, but also provides more integrated functions. These include a lubricator that distributes the minimum volume of lubricant. This enables lubrication with oil (rather than grease), regardless of the mounting position and without additional precautions needing to be taken such as extra lubricant connectors on both sides of the carriage.

By optimising the design, materials and manufacturing process for the

RUE25-E, Schaeffler has also reduced friction and displacement resistance by approximately 40%. This results in improved performance in terms of the running characteristics and dynamics of the guides, as well as an increased maximum travel speed of up to 3 m/s.

The power density of the unit is therefore higher, while the size and dimensions remain similar. The new optimised sealing concept for the RUE-E series is also fully maintained.



▲ RUE-E linear recirculating roller bearing

The RUE25-E can be retrofitted as a one-for-one replacement of its predecessor, the RUE D series.

The guideways remain unchanged, but the carriages and guideways can now be combined in any way desired. The units can be specified in accuracy classes G2 or G3. The RUE25-E is available as a standard flange mounted unit, with either a long flange carriage or a high, long carriage.

ABT SPORTSLINE AND SCHAEFFLER CELEBRATE FIRST WIN IN FIA FORMULA E IN BEIJING



AS THE EXCLUSIVE TECHNOLOGY PARTNER OF TEAM ABT SPORTSLINE, SCHAEFFLER IS CELEBRATING THE TEAM'S FIRST WIN IN FIA FORMULA E, AFTER LUCAS DI GRASSI STOLE VICTORY IN THE INAUGURAL FORMULA E EVERGRANDE SPRING BEIJING EPRIX, WHICH TOOK PLACE IN BEIJING, CHINA ON 13TH SEPTEMBER 2014.



▲ A strong team behind the champion: Prof. Dr. Peter Gutzmer (the fourth from left), Schaeffler Group deputy CEO and CTO, Joerg Walz (third from right), Vice President Communications and Marketing Schaeffler Automotive, Dr. Zhang Yilin (the first from left), Schaeffler Greater China CEO.



THE FORMULA E CAR IN DETAIL

Vehicle:	Formula car, carbon/aluminum monocoque chassis
Power unit:	Rear-wheel drive from two motor generator units (MGUs)
Transmission:	Sequential 5-speed, with paddle shifters
Output (practice & qualifying):	200 kW (270 hp)
Output (race):	150 kW (202.5 hp), additional power output of 30 kW (40.5 hp) by #FanBoost for three drivers
Acceleration:	0-100 km/h in 2.9 sec
Top speed:	225 km/h
Minimum weight:	888 kg (incl. driver)
Dimensions:	Length: 5,000 mm, Width: 1,800mm, Height: 1,250 mm
Tires:	Low profile tires

The FIA Formula E series takes place in major cities around the globe using fully electric vehicles. ABT Sportsline is the only German team in an international field that includes teams from the USA, India, China and Europe. The former Formula One stars Alain Prost and Jarno Trulli have entered their own teams, as well as adventurer Richard Branson and actor Leonardo DiCaprio. More than ten drivers have Formula One experience, including Brazilian Lucas di Grassi (30), who also competes in the FIA World Endurance Championship (WEC). Team ABT Sportsline's second cockpit is occupied by German youngster Daniel Abt (21), who is also competing in GP2 as part of the

Formula One supporting programme. Schaeffler logos are featured on the cars of both Daniel Abt and Lucas di Grassi.

Formula E events are not held on permanent race tracks but on street circuits in the heart of major cities. After Beijing, Formula E will visit Putrajaya (Malaysia), followed by Punta del Este (Uruguay), Buenos Aires (Argentina), Miami (USA), Long Beach (USA), Monaco, Berlin (Germany), culminating in London (UK) where the final will take place on 27th June 2015.

At the events, practice, qualifying sessions and the race itself all take place over a single day.

▲ The all electric racing car in Formula E can reach from zero to 100km/h within three seconds.

"Helping to shape the electrification of the automobile is one of our key strategic topics of the future. Schaeffler is an innovation leader in this field, frequently pioneering new ideas. Formula E is bold and visionary, which makes it a perfect fit for us and an ideal complement to our commitments in DTM, WEC and Formula Student," commented Prof. Peter Gutzmer, Member of the Management Board for Technology at Schaeffler. "Motorsport is not only ideally suited to accelerating the further development of new technologies, but also energises the

topic of electric mobility with emotions in a fascinating way," he continued.

The collaboration with ABT Sportsline has a long-term focus and far exceeds a pure sponsoring arrangement. "We're supporting the further development of the racing car and its components in the future, supported by the knowledge and experience of our engineers at Schaeffler," added Gutzmer.

Hans-Jürgen Abt, Managing Director of ABT Sportsline commented: "We're delighted that in Schaeffler we have on board the perfect partner for the challenges we face in Formula E. From the company's presence in DTM we've come to know the passion with which all the employees support motorsport."

▼ Lucas di Grassi celebrates the race win



▲ Schaeffler chief technology officer Prof. Peter Gutzmer and team principal Hans-Jürgen Abt signing the contract

"The collaboration in the field of technology is a very important aspect. Starting in the second season, the teams will be allowed to subject some of the vehicle's components to further development – so a partner with such a wealth of engineering expertise and experience in electric mobility is obviously worth a mint," he added.

Schaeffler is a renowned supplier to the automotive industry, as well as a leading manufacturer of rolling bearings worldwide. A development partner to the automotive industry with system expertise for the entire drive train, Schaeffler is continuously developing new lightweight, lower friction, more energy-efficient components and systems for vehicle engines, transmissions and chassis. This is helping to reduce vehicle weight, improve fuel consumption and minimise CO₂ emissions.

Schaeffler is working with a number of major automotive manufacturers, both within and outside of the UK, to co-develop more energy-efficient solutions for internal combustion engine-powered vehicles. These include UniAir, the world's first fully variable hydraulic valve control system; a thermal management module for internal combustion engines that reduces CO₂ emissions by up to 4%; a lightweight spur gear differential that is 30% lighter than its predecessor and creates up to 70% free axial space in the gearbox; and low friction angular contact ball bearings for turbochargers, which are helping to set new performance benchmarks in high-end passenger cars, light duty and heavy duty trucks.

Schaeffler is also involved in the development of concepts and components for the next-generation of hybrid and all-electric vehicles. One of these, the eDifferential, is an active electric differential installed on the front and rear axles, which combines the electric drive with the option of wheel-selectable drive power control. This enables torque distribution between the right and left wheel, which enhances driving dynamics, safety and comfort.

Schaeffler also develops bearings, bottom brackets and other components for electric bicycles (e-bikes). These maintenance-free components offer longer operating life and smooth, lower friction operation, resulting in high efficiency and dynamics, as well as improved comfort.



Formula E drivers (Left) Lucas di Grassi and Daniel Abt.

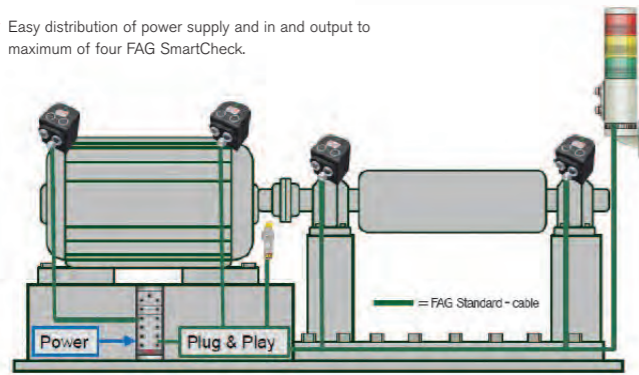
NEW POWER UNIT AND ALARM INDICATOR SIMPLIFY CONNECTION OF UP TO FOUR FAG SMARTCHECK DEVICES

SCHAEFFLER HAS LAUNCHED TWO NEW PRODUCTS THAT SIMPLIFY THE DISTRIBUTION OF POWER AND INPUT/OUTPUT (I/O) SIGNALS OF UP TO FOUR FAG SMARTCHECK ONLINE CONDITION MONITORING DEVICES, RESULTING IN REDUCED CABLING COSTS AND FASTER, EASIER INSTALLATION.

The FAG SmartConnectBox power supply unit enables easy distribution of power supply inputs and outputs to a maximum of four FAG SmartCheck devices. In addition, a standard speed sensor and Schaeffler's new FAG SmartLamp local alarm indicator unit can also be connected to the FAG SmartConnectBox.

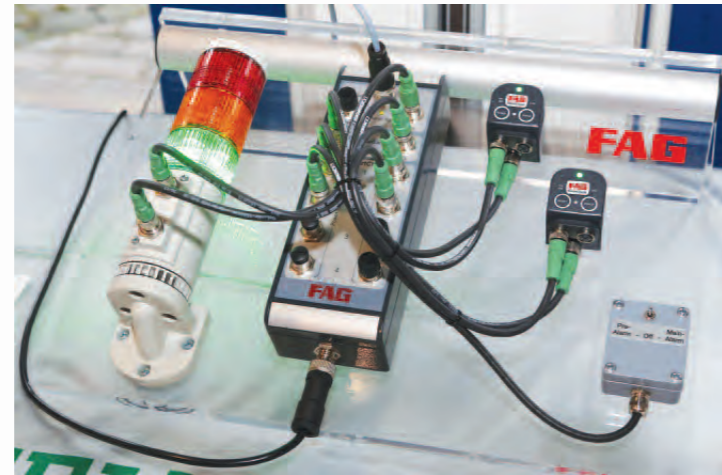
Rather than running separate cables from four FAG SmartCheck devices to a speed sensor, this new system provides a cleaner, more elegant solution for customers, particularly when monitoring the condition of large rotating machines such as electric motors, geared motors and variable speed drives.

▼ Easy distribution of power supply and in and out to maximum of four FAG SmartCheck.



FAG SmartCheck is an extremely compact, online condition monitoring device that monitors vibration and temperature, as well as a range of other machine and process-specific parameters such as pressure and flow rate.

By monitoring these parameters, users are provided with a broad basis of information in real time, which enables the accurate assessment of machine condition. The device is typically mounted direct to the machine housing.



▲ FAG SmartConnectBox and FAG SmartLamp.

FAG SmartConnectBox also provides two analogue inputs (0-10V, 4-20mA), four analogue outputs (0-10V, 4-20mA) and a digital output, enabling the system to output data to other production control systems and PLCs. FAG SmartLamp enables local visualisation of the alarm status of each SmartCheck device. This is particularly useful if the four SmartCheck devices are installed in a location that is hidden from view.



Small and lightweight, the device can fit into areas on a machine where space is restricted.

Due to its IP67 protection rating, the FAG SmartConnectBox can also be mounted direct to the machine being monitored. The user must provide the SmartConnectBox with a power supply, but configuration of the FAG SmartCheck device is not always necessary – the user simply plugs in the devices with the standard cables provided and the system is ready to use in the default setting.

EXCEPTION-BASED REMOTE CONDITION MONITORING FOR UECC SHIPS' GEARBOXES



SCHAEFFLER UK HAS INSTALLED CONDITION MONITORING SYSTEMS ON TWO SHIPS OPERATED BY UNITED EUROPEAN CAR CARRIERS (UECC). THE MONITORING SYSTEMS, WHICH ARE INSTALLED IN THE SHIPS' ENGINE CONTROL ROOMS, ARE SET UP TO MONITOR THE VIBRATION BEHAVIOUR OF THE ENGINE GEARBOXES.

As well as supplying and installing the condition monitoring hardware, Schaeffler is also providing ongoing exception-based remote monitoring services via V-SAT link.

This service not only provides an early warning system for any potential gearbox failures, but also generates useful diagnostics and trend data that UECC can give to class inspectors (e.g. Lloyds Register) during routine ship audit inspections. These gearbox diagnostics reports eliminate the need for time consuming, inspections, which cost tens of thousands of pounds per gearbox and cause costly delays while the ships remain in dry dock.

UECC is Europe's leading provider of short sea RoRo transportation. The company transports around 1.5 million units per year from a fleet of 23 vessels, two of which – the AutoStar and AutoSun – are fitted with Schaeffler's FAG DTECT X1s vibration monitoring systems.

On each ship, a single, 8-channel FAG DTECT X1s system is set up to monitor four vibration points (two on the gearbox input shaft and two on the output shaft) on each of the two main engine gearboxes. The systems are mounted close to the gearboxes in protective enclosures. A panel PC displays the vibration data from each gearbox.



▲ The UECC vessel AutoStar

UK-based company Hargreaves Marine, Schaeffler UK's partner for the marine industry, was responsible for the specification and installation of the FAG DTECT X1s systems, as well as the ongoing remote monitoring service.

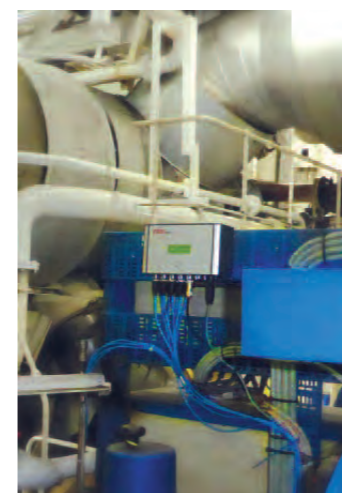
The condition monitoring systems were installed in 2013 and have already proved their worth at UECC.

Hargreaves Marine Managing Director, Bob Hargreaves says "If an alarm is generated from the FAG DTECT X1s systems, we can immediately see this regardless of where the ships are located in the world. We can see which bearing on which gearbox is responsible for triggering the alarm, and then decide whether action is required by the ship's engineers."

"We've adopted an exception-based monitoring strategy, whereby every 12 hours, vibration data from the gearbox monitoring systems is sent ashore to us via satellite link and cloud server. We can look at the vibration frequency of the bearings inside the gearbox in order to detect any deviations from the norm. We can therefore monitor the health of the gearboxes and notify the ship's engineers if any remedial action is necessary."



▲ The UECC vessel AutoSun



The systems are connected to the ship's V-SAT communications system.

The FAG DTECT X1s is a condition monitoring system that is suitable for use in a wide range of industrial and marine environments, including the monitoring of rotating components and machines such as bearings, gearboxes, turbochargers, compressors, fans, pumps and drives.

All commonly used acceleration, speed and displacement sensors can be connected to the FAG DTECT X1s, enabling process parameters such as speed, temperature, torque and pressure to be monitored.

◀ FAG DTECT X1s installation



▲ FAG DTECT X1s



OIL ANALYSIS AND VIBRATION MONITORING PROVIDE EARLY WARNING TO PLANT OPERATORS

MODERN LUBRICANTS ARE REGARDED AS 'HIGH END CONSTRUCTION PARTS' THAT PLAY AN INTEGRAL ROLE WITHIN THE MACHINE ON WHICH THEY ARE USED. IT IS CRITICAL THAT ANY SYSTEMS SET UP TO MONITOR THE CONDITION OF A MACHINE ARE ALSO CAPABLE OF MONITORING THE CONDITION OF THE LUBRICANT.

The latest generation of condition monitoring systems do just this, enabling plant operators to monitor both the condition of lubricating oils and the vibration of critical components such as gears and rolling bearings, on a wide range of heavy duty rotating plant and machinery.

The system's oil monitor works by utilising an inductive particle counter (sensor), which is able to distinguish between ferrous and non-ferrous metal particles that are present in the lubricating oil.

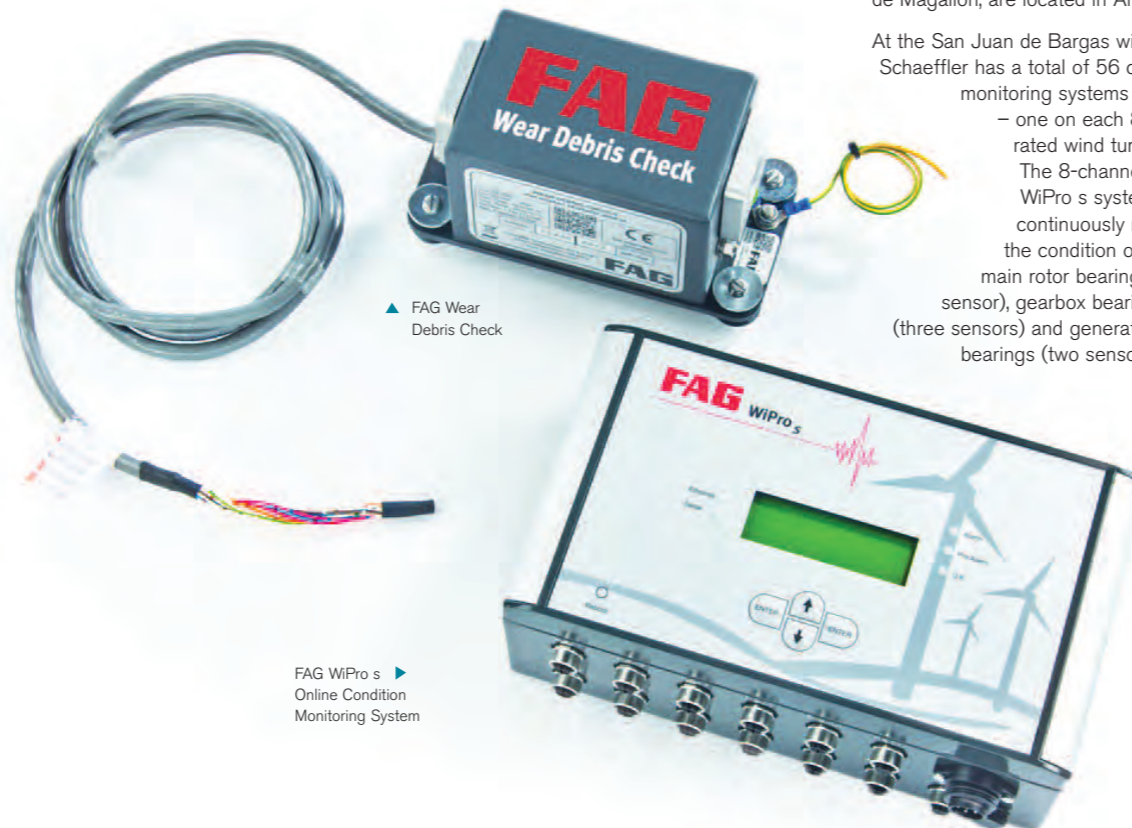
On a typical gearbox application, the particle counter or sensor is installed in the oil flow, directly before the oil filter, or as a separate circuit. The sensor operates on the principle that any wear to a component such as a bearing or gear tooth will result in small metal particles being rubbed off into the oil, often several months prior to an actual failure.

The sensor provides information on the number of particles present in the oil, and then classifies these according to their physical size. Analysing the oil in this way enables damage and wear to the gears to be detected much earlier, even in planetary gearboxes used on wind turbines.

In addition to oil analysis, the FAG Wear Debris Check can be set up to operate in conjunction with online condition monitoring systems, including Schaeffler's FAG WiPro s, a system dedicated to the condition monitoring of wind turbines. This means that companies can also monitor the vibration behaviour of the machine and its components, including rolling bearings and gear wheels. By using special interfaces, these systems can be easily integrated with online vibration monitoring systems, which can be adapted or retrofitted to suit customer requirements. By installing vibration sensors on the machine or gearbox that needs to be monitored, changes in the operating behaviour are detected, indicating early signs of damage. This enables the plant to start suitable repair work or plan some scheduled maintenance in order to prevent failure of the machine, resulting in costly production downtime.

Industrial gears and gearboxes, for example, are critical to the smooth operation of heavy plant, including wind turbines. If excess wear or damage is allowed to develop within a gearbox, this could result in secondary damage to other drive train systems, leading to high repair costs and costly downtime.

Fixed (online) condition monitoring systems can be set up to monitor both the condition of the lubricating oil and the vibration of rotating parts, enabling the early detection of damage to heavy duty, oil-lubricated industrial gears. Schaeffler's FAG Wear Debris Check oil monitoring system indicates damage or wear to bearings, cages and gears within a gearbox or other industrial gear unit. The system requires no calibration and is suitable for use in almost every industry sector, including wind turbine gearbox drive trains, providing plant operators with a reliable system for preventing unplanned downtime and reducing MRO costs.



▲ FAG Wear Debris Check

FAG WiPro s ▶ Online Condition Monitoring System

REMOTE CONDITION MONITORING BRINGS BIG SAVINGS FOR SPANISH WIND FARM

BY INSTALLING CONDITION MONITORING SYSTEMS FROM SCHAEFFLER ON 56 WIND TURBINES, SPANISH RENEWABLE ENERGY PROVIDER GEOLICA IS MAKING SIGNIFICANT ANNUAL COST SAVINGS.

For wind farms, any unplanned downtime caused by damaged wind turbine drive train components can have significant economic consequences in terms of lost production and costly repairs. To avoid this, Geolica required a condition monitoring system for its wind turbines, which would detect any signs of damage to drive train components at an early stage, avoiding any unplanned downtime and giving the company an opportunity to plan any necessary maintenance work.

As Geolica had little experience of condition monitoring systems and analysing vibration data, the company also required a remote monitoring service and technical support from the condition monitoring system supplier.

Geolica operates two wind farms in Spain with a total installed power base of 84.8MW. The wind farms, San Juan de Bargas and Santo Cristo de Magallon, are located in Aragon.

At the San Juan de Bargas wind farm, Schaeffler has a total of 56 condition monitoring systems installed – one on each 800kW rated wind turbine. The 8-channel FAG WiPro s system continuously monitors the condition of the main rotor bearings (one sensor), gearbox bearings (three sensors) and generator bearings (two sensors).



Schaeffler also provides remote monitoring services on a 24/7 basis. This includes a monthly condition monitoring report, as well as an alarm report if measured values move outside of their normal range.

FAG WiPro s

Schaeffler's FAG WiPro s is an online condition monitoring system that is suitable for the permanent monitoring of wind turbines. The system is extremely compact, offering a high degree of flexibility for end users. The system combines all control modules into a single compact housing, enabling easy installation in control cabinets. The integrated multiplexer enables the recording of signals from up to eight different sensors.

FAG WiPro s monitors vibration conditions which, if left undetected, can cause costly shutdowns of wind turbines. These conditions include damage to bearings and gears, as well as shaft misalignments. If a specified threshold value or alarm limit is exceeded, the system triggers an alarm. The vibration monitoring data can be analysed directly on site or can be retrieved via a TCP/IP communications link and analysed by either the end user or by Schaeffler.

Significant savings

Since installing the FAG WiPro s systems at the wind farm, vibration measurement data is continuously monitored by Schaeffler's Online Monitoring Centre. Schaeffler provides Geolica with detailed information about the wind turbines, which has enabled the company to adopt a condition-based maintenance strategy. Thanks to the FAG WiPro s systems and Schaeffler's online remote monitoring support, costly damage to drive train components has already been prevented on several occasions.

For example, two years after installing the condition monitoring systems, early signs of damage were detected to the raceway of the inner ring and rolling elements on an intermediate speed shaft bearing on a wind turbine gearbox. The total cost of replacing this bearing was €9,500. However, if the damage had not been detected, the cost of a new gearbox would have been around €100,000. Therefore, allowing for the annual cost of providing a remote monitoring service for Geolica (€9,000), the cost savings achieved were €81,500. ■



CONDITION MONITORING

VIP LEE

Schaeffler recently hosted a customer Golf Day at Lindrick Golf Club and, to the delight of many, Lee Westwood OBE – who has represented Europe for the last eight Ryder Cups, made a surprise appearance.

The Club had invited Lee Westwood to 'cut the ribbon' to officially open their brand new tunnel, which enables golfers to go under rather than across a busy road in-between the 10th and 11th holes.



It made for a great opportunity for some of our Schaeffler hosts and customers to get photos and autographs, and to even see him play the last hole! ■

▲ Karen Preston, Communications & Marketing Manager (left) and Rebecca Haynes, Marketing Assistant (right) with Lee Westwood OBE

LONG SERVICE AWARDS

CONGRATULATIONS TO THOSE WHO HAVE RECENTLY REACHED A LONG SERVICE MILESTONE

30 YEARS SERVICE



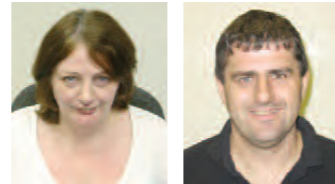
Debbie Millington
Sutton Coldfield

Neil Walters
Llanelli

John Bailey
Llanelli

Michael Thomas
Llanelli

20 YEARS SERVICE



Kathy Knight
Sutton Coldfield

David Rees
Llanelli

25 YEARS SERVICE



Greison Nethell
Llanelli

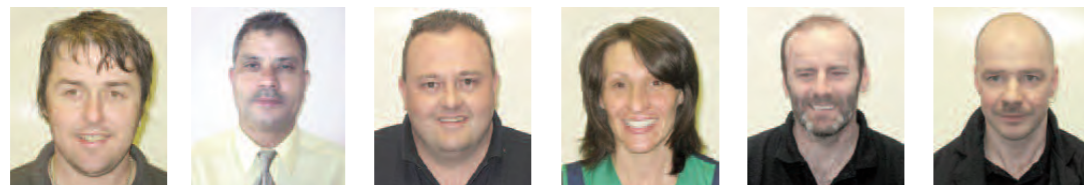
Robert Davies
Llanelli

Andrew Sheridan
Llanelli

Andrew Carter
Llanelli

Paul Jenkins
Llanelli

Huw Jenkins
Llanelli



Leighton Williams
Llanelli

Jas Moore
Sutton Coldfield

Wayne Powell
Llanelli

Anna Rees
Llanelli

Richard Hallet
Llanelli

Nigel Jenkins
Llanelli

LEADERSHIP AND PROFESSIONAL DEVELOPMENT COURSE



▲ Dr Steve Lacey, Birgitta Liesching and Richard Hall

Well done to Birgitta Liesching, Schaeffler Technology Centre – Sutton, and Paul Davies, Resident Project Engineer at Jaguar – Sutton, who have recently received their certificates after completing the leadership and professional development course!

Paul Davies

LONG SERVICE AWARDS PRESENTATIONS AT SUTTON

During the successful Christmas meal in Sutton at the end of last year, we had the chance to celebrate the long service awards for those employees who couldn't make it to the Summer Ball.



▲ Colin Woodhoods and Richard Hall



▲ Karen Preston and Richard Hall

Colin Woodhoods 40 Years
Richard Maskew 40 Years
Karen Preston 25 Years
Gary Mackintosh 10 Years

15 YEARS SERVICE

Claire Jones
Llanelli



Dorian Quirk
Llanelli



John Hutchings
Llanelli



Andrew Parkhouse
Llanelli

THE MACMARATHON

Paul Griffiths – Llanelli, is putting together a team of people to take part in this years Gower MacMarathon.

Entrants can choose to do a 22 mile or 14 mile walk to raise funds for MacMillan Cancer Care. The walk is taking place on Saturday 13th September, and once again the Company is providing transportation from the plant, to the event and back. The walk takes you along the South coast of the Gower, along a strenuous route in places, however you are rewarded with some of the most spectacular views in Wales. If you are interested in participating in this event, please contact Paul for more information or visit the MacMillan website. ■



WE ARE MACMILLAN. CANCER SUPPORT

NEW BABY NEWS!



Luke Stacey, final year Apprentice – Llanelli, has become the proud father of a baby girl. Eve Aurora Stacey was born on the 20th March 2014 at 4:24pm at Glangwilli Hospital. She was 3 weeks premature but was out of the hospital after one night. Congratulations to Luke and his new family!



Nigel Howard, Met Lab Technician – Llanelli, has also become the father of a baby girl. On the 25th April 2014 his daughter Mali Alys Hill-Howard was born and she weighed 6lb 14oz. Congratulations to Nigel and his family on the birth of Mali!

SWIMMING WITH SHARKS



Francesca with whale shark

Siobhan Griffin, New Business Coordinator – Sutton, and her daughter Francesca had the opportunity to swim with whale sharks at Ningaloo Reef, Australia's largest and most accessible fringing coral reef, on their recent trip to Australia.

The whale sharks were approximately 6m in length, and were still children, but the adults grow to 12m and weigh 21.5 tons! Siobhan has commented "it was amazing and something I will never forget, the sea was so clear and they were so serene just gliding alongside me". ■



Early diagnosis of machine condition is key to healthy engineering plant and equipment

By monitoring the vital signs, engineers are in control of their plant and machinery and can prevent unforeseen problems turning into costly breakdowns.

Online fixed systems and handheld CM devices from Schaeffler have a proven track record in a diverse range of industry sectors from steel, paper, quarrying and mining to pharmaceuticals, food processing, wind energy and marine. However, the objective is the same: to maximise production output by avoiding unplanned downtime.

Our experienced CM engineers work closely with production and plant personnel to understand and maintain efficiencies and achieve cost savings. Call us on 0121 313 5870 to arrange a no-obligation site visit by one of our engineers.

