SCHAEFFLER

LuK INA FAG

INMOTION

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E-Wheel Drive

Schaeffler and Ford unveil concept Fiesta with space-saving electric wheel hub drives

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E-WHEEL DRIVE CONCEPT CAR COMPLETES THE SILVRETTA E-CAR RALLY

SCHAEFFLER'S FIESTA E-WHEEL DRIVE CONCEPT CAR SUCCESSFULLY COMPETED AGAINST OTHER ELECTRIC VEHICLES IN THE 4TH SILVRETTA E-CAR RALLY IN MONTAFON, AUSTRIA.

The Silvretta E-Car Rally is an annual three-day race between electric vehicles over three Alpine stages. The drivers must economise on the use of kilowatts, volts and amperes in order to avoid penalty points and to finish with sufficient battery charge. The car finished ahead of other electric vehicles, some of which are already in volume production.

The Fiesta E-Wheel Drive concept car is the result of a collaborative project between Schaeffler and Ford. The concept car is powered by two highly integrated wheel hub drives installed in the rear wheel arches. All components required for driving, deceleration and safety – such as electric motor, power electronics, controller, brake and cooling system – are mounted within the wheel rims.

These provide power outputs of 40 kW per drive, and a continuous output of 2 x 33 kW, which equates to 110 hp and 90 hp respectively. The liquid-cooled wheel hub drive delivers up to 700 Nm of torque. The voltage of the high-voltage drive is 360-420V.

Schaeffler's CTO Prof. Peter Gutzmer, who shared the cockpit with Prof. Pim van der Jagt, Managing Director of Ford Research & Advanced Engineering Europe, commented: "Schaeffler wanted to gain additional experience in terms of the level of development of the wheel hub drive, which is intended for urban electric vehicles of the future. We completed this challenging three-day rally with a pre-production model without any problems, even on long, steep hill climbs and during downhill driving with energy recovery – a significant advantage offered by electric vehicles."

YOUNG ENGINEER CREATES A BIG BANG

ALAN EGAN, FORMERLY AT KING EDWARD VI CAMP HILL BOYS SCHOOL IN KINGS HEATH, BIRMINGHAM, AND NOW AT THE UNIVERSITY OF CAMBRIDGE, HAS WON THE YOUNG ENGINEERS' DUKE OF YORK AWARD (ROSE BOWL) FOR 'CREATIVE USE OF TECHNOLOGY'.

Alan received the Award at The Big Bang UK Young Scientists and Engineers Fair at London's ExCeL Conference Centre on 15th March. Schaeffler UK is a sponsor of Young Engineers.

The aim of Alan's project, entitled 'Using colour to build better user interfaces', was to design and build a colour-based user interface that could be connected to a variety of professional electronic devices such as audio, video and lighting equipment, which would help simplify the whole user interface experience for novice users.

The project involved a wide range of technical disciplines: complex circuit design; custom-designed PCBs (Printed Circuit Boards); the use of LEDs to generate changeable colour components; mechanical design of the casing; manual soldering of electronic components to PCBs; software; manufacturing of a 3D printed frame; and designing the necessary interfacing to other electronic devices.

From left: Presenter Greg Foot, Alan Egan, and Karen Preston, Marketing Manager at Schaeffler presenting the Award to Alan

As Alan commented: "I came up with the idea of using colours as a key paradigm in the interface, primarily because the price of large graphical LCD displays was prohibitively expensive at the time. I've always been very interested in electronics and wanted to see if I could build something that was efficient and cost effective but also easy to use."


▲ HRH The Duke Of York discusses Alan Egan's project with him at the Big Bang Fair

"My aim was that by using colours, it would be easier for novices to pick up on how to use the system. That's particularly important in the case of school video or lighting desks or a small theatre. Also, by using LEDs for the majority of the interface instead of a large LCD screen, a great deal of cost is removed while adding flexibility."

As Alan concluded: "Overall, I'd have to say the project was very successful. Not only did I have a fantastic time working on the project and learnt a huge amount of new skills in a wide variety of disciplines, but I also managed to produce a device that is functional and useful, and more expandable than I'd previously imagined."

Roy Edwards, Chief Executive of the Young Engineers charity said "Alan is a very worthy winner ... an excellent example of the type of young person who is needed to drive the UK economy forward."

IADA SUPPLIER OF THE YEAR AWARD GOES TO SCHAEFFLER

SCHAEFFLER (UK) LTD HAS RECENTLY BEEN PRESENTED WITH THE 2013 'SUPPLIER OF THE YEAR AWARD' FROM IADA. THE AWARD IS VOTED FOR BY IADA MEMBERS AND IS BASED ON CUSTOMER SERVICE, QUALITY AND RANGE OF PRODUCTS, DELIVERY, RELIABILITY AND OVERALL BUSINESS PERFORMANCE.

Kate Hartigan, Managing Director of Schaeffler (UK) Ltd received the award on behalf of her team from James Gibson, Marketing Director of IADA, saying, "We are really delighted to accept this Best Supplier award, which is a most welcome recognition for 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, and hopefully win next year's award too!"


▲ Martin Ryan (Schaeffler), James Haley (IADA), Des Pattinson (Schaeffler), James Gibson (IADA), Kate Hartigan (Schaeffler), Phillip Clarke (IADA), Jan Lilly (IADA), Jamie March (IADA)

James Gibson, IADA Marketing Director echoed Kate Hartigan's comments adding that, "All the staff at Schaeffler thoroughly deserve this award as they have shown huge levels of commitment to IADA and its members by providing the very highest 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 19 members and operates over 50 branches across the UK. Key to the success of IADA over the past 15 years has been 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 – this has already led to several new contracts being signed over the past few months. ■

SCHAEFFLER UK RECOGNISED FOR QUALITY EXCELLENCE


▲ Joachim Haes (Schaeffler Group Operations Director, Lash Adjusters), Dorian Quirk (Quality Manager), Mark Tucker (Plant Controller), Dr. David Bate (Deputy Plant Manager & Production Manager), Roger Evans MBE (Plant Director), Donna Williams-Bevan (Training Officer), Sarah Townsend (consultant to Schaeffler UK), Adrian Roberts (HR Director), Vincent Kane (Chairman, Wales Quality Centre)

Schaeffler UK's automotive component plant in South Wales scooped the top prize at the recent Wales Quality Award ceremony for the plant's achievements in manufacturing quality.

Schaeffler UK received the coveted Overall Quality Award, as well as the "Process" Prize. The annual awards ceremony took place at the City Hall, Cardiff.

The Wales Quality Award is an annual competition based on the EFQM European Excellence Model. The awards are open to all companies based in Wales, including manufacturers, financial organisations, hospitals, educational establishments and local councils.

Winning a Wales Quality Award is an accolade for any business. The judging and assessment process, which is carried out by a panel of independent industry experts from the private and public sectors, has grown to become one of the most popular awards in Europe. Many organisations that take part in the awards process do so year after year, as they use the process as a fundamental part of their company's planning process to drive improvement.

Roger Evans, Plant Director at Schaeffler UK commented: "Although Schaeffler has won an award from the Wales Quality Centre each year since 2008, this is the first time that we've won the Overall Quality Award. We are very proud to receive this award, which we believe acknowledges our ongoing commitment to continuous improvement here at the plant. Together, the two awards recognise our strategy, plans and processes that we are preparing, which will ensure the success of Schaeffler UK in the future." ■

GOLDWIND EXCELLENT QUALITY AWARD 2012 FOR SCHAEFFLER

Schaeffler has won a 2012 Excellent Quality Award from Xinjiang Goldwind Science & Technology Co. Ltd., an internationally recognised manufacturer of wind turbines headquartered in China. The 2012 Excellent Quality Award was presented to Schaeffler during Goldwind's 4th Annual Supplier Conference in February. This is the third consecutive year that Goldwind has awarded a prize to Schaeffler

Goldwind's statement at the presentation was a glowing commendation: "Schaeffler has always been committed to achieving its quality objective of 'zero defects' and a focus on quality in all areas is an integral part of Schaeffler's corporate culture. In 2012, Schaeffler achieved a quality pass rate of over 99% in its bearing supplies to Goldwind, was consistently responsive and actively cooperated with us in addressing quality concerns, and made an important contribution to upgrading the reliability and quality of our turbines," said Mr. Ni Wanchun, Director of Quality at Goldwind. ■


▲ Mr Ni Wanchun (right), Director of Quality at Goldwind, presented the award to Mr Sun Weidong, Vice President Sector Management Renewable Energies, Railway and Aerospace at Schaeffler Greater China.

We welcome your comments on this or any of our articles, and would be very pleased to receive your feedback on "In Motion"
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PEOPLE NEWS

KATE HARTIGAN TO RETIRE AFTER 20 SUCCESSFUL YEARS

AFTER 20 YEARS OF SUCCESSFUL SERVICE WITH SCHAEFFLER, KATE HARTIGAN WILL BE TAKING A WELL-EARNED RETIREMENT. FOR THE NEXT FEW MONTHS UNTIL DEC 2013, KATE WILL CONTINUE TO SUPPORT SCHAEFFLER UK LTD IN AN ADVISORY CAPACITY.

On 1st August 2013, Kate's duties and responsibilities as Managing Director were transferred to Roger Evans MBE. Roger will continue in his current role as Plant Director at Llanelli. Richard Hall has assumed Kate's operational/business responsibilities as President Industrial UK & Ireland, reporting to Mr Uwe Hartmann, Senior Vice President Industrial Sales Europe. We wish Roger and Richard every success in their new roles.

Karen Preston, Marketing Services Manager at Schaeffler UK, interviewed Kate about her time at the company, the highlights and challenges along the way.

KP: In your time at Schaeffler, what would you say has been your greatest achievement?

KH: I don't think of any achievements as "mine" – our successes have been achieved by everyone working together for a common goal. An example of this is the turn round of our Llanelli plant. As part of an international group with multiple production locations, we are always at risk of losing products from the UK. Not long after my appointment as M.D. in 1999 the decision was made to transfer the production of tension pulleys to Slovakian plants.

Richard Hall presents Kate with a leaving gift on behalf of the Company.

This was a major loss and left us exposed to eventual closure.
We fought long and hard to improve performance at Llanelli to a point where its future was secured. All employees were involved in a culture change programme, which improved both attitudes and productivity by increasing skills and nurturing flexibility. But it's an ongoing challenge to remain competitive and so we cannot afford to rest on our laurels. The significant investment in new plant and processes at Llanelli over the past two years recognises the progress made during the past decade and is a further sign that the Group views our UK plant as an important part of the Engine Systems production strategy.
This significantly underpins a successful future for our factory and employees in Wales.

Another achievement for the company has been the successful integration of the INA and FAG businesses and the promotion of our Schaeffler brands in the UK. We have seen steady growth of our market share despite tough economic conditions, and that is because every person in the business understands the importance of nurturing customer relationships and ensuring that our technical and commercial service is as good as it can possibly be.

KP: What has been the biggest change that you've witnessed during your time here?

KH: I would say the change of strategy and approach in the leadership of the Group. When I joined what was then INA Bearing Company Ltd in 1994 as Financial Director, I was amazed at the level of autonomy in the subsidiary companies, as well as the lack of integrated financial reporting systems. The Company was very anti-publicity and was comparatively secretive, although it was extremely successful and growing organically.

Today, the Group is several times larger and has fully integrated both the FAG and LuK businesses and brands to become the biggest wholly family-owned Group in Germany, and a major

player in the premier bearings and precision automotive components markets. The Company is run on the lines of a public corporation and is far more communicative than in the old days. In terms of marketing and communications, we've become more visible here in the UK in certain industry sectors. We've increased our profile in key customer markets by, for example, exhibiting at selected trade show events, which have generated additional income.

KP: How has the bearing industry and customer base changed over this period?

KH: The industry has become much more competitive, because our customers have to survive in an increasingly challenging environment. However, many of the people in the industry have been in the bearing business all of their lives and this ensures some lasting relationships, which make the bearing industry a fascinating place to work.

The profile of our customers has changed too. The ratio of MRO (Aftermarket) to OEM (Original Equipment Manufacture) business has increased significantly compared to 15 years ago.

▲ Members of the Senior Management Team: l-r Martin Ryan, Steve Lacey, Richard Hall, Kate Hartigan, Adrian Roberts, Des Pattinson

There has been a reduction in large OEM customers in the UK, but revenues from Aftermarket business growth increased to more than offset this.

KP: How challenging has it been for you as a female working in a male-dominated industry?

KH: I don't know any different and I wouldn't have it any other way! I have excellent relationships with my male colleagues, both within the company and externally. In fact, in some ways, once you attain a senior management role, being a woman can actually be an advantage as it can make a difficult situation less confrontational. Or maybe that is more about keeping calm and maintaining respect for others rather than having a female presence!

KP: What did you most enjoy about working for Schaeffler?

KH: Again, working with the people in the team. That is what I will miss most when I finally wave goodbye to Schaeffler at the end of the year.

We have worked together successfully, but have managed to have fun at the same time, which I feel is very important. We spend much of our lives at work and we need to enjoy that time, although of course the outcomes must be serious. Above all it is important not to take yourself too seriously!

KP: What has been the most satisfying/ rewarding aspect of your time at Schaeffler?

KH: Without a doubt, helping to develop and grow the business with a strong, capable and committed team around me. I have often said to my colleagues here that even though we are all in the same boat, we have to make sure we are all rowing in the right direction. There have been some tough times over the years, when product was transferred to other countries from Llanelli and when redundancies had to be made.

Also, as one customer after another folded their UK production plants and transferred production to so-called lower cost locations, we have focused on applying our core values to forge strong relationships with our employees, our customers and our Group colleagues to underpin steady, profitable growth for the organisation. I've also liked how varied the role has been for me over the years. One day, I can be with a customer viewing one of our large bearing applications in a steel mill. The next visit could be with a customer using our bearings on an electric vehicle.

KP: Have there been any disappointments or regrets along the way – either personally or from a business perspective?

KH: Having to lose some really good employees to redundancy when business strategies drove volume reductions. That is always hard, but the experience drives a determination to ensure that it never happens again. Here in the UK we are doing everything we can do in order to create more efficient and productive processes to ensure that we remain as competitive as we can possibly be against internal [other production plants within the Group], as well as external competition.

KP: What are your fondest (and funniest) memories of your time here?

KH: There are of course too many to mention! However, I think it would be little cameos that remind me of individuals I have worked with over the years, or comments that made us all laugh.

That would include some quaint expressions from German colleagues – their English is always brilliant but some things don't translate exactly! In return I have to say I have caused them many a smile with some of my own attempts to use my rather limited German.

KP: What are your plans post-Schaeffler?

KH: I will be working on a part-time basis with Schaeffler until the end of the year, supporting the handover and finalizing one or two projects that kept slipping onto the back burner! During that time, I would like to develop a portfolio of non-executive directorships in which I can use my experience to contribute towards several other businesses in different sectors.
That will keep me very busy, but at the same time will be a rewarding way to keep on learning.

KP: Is there any advice you would like to offer to your successor(s)?

KH: Stick to our core values: Commitment, Respect, Integrity, Innovation and Passion. If every decision is gauged against those values and passes the test, you won't go far wrong! ■

FACT FILE: KATE HARTIGAN

Joined Schaeffler:	1994 as Financial Director
Appointed Managing Director:	January 1999
Favourite Book:	Lord of the Rings
Favourite author:	Patrick O'Brien (Aubrey/ Maturin series), plus most of the classics!
Favourite Music:	Anything that isn't punk, rap or jazz
Favourite Films:	The Harry Potter series, Lord of the Rings Trilogy, The Outlaw Josey Wales
Favourite Food:	Indian cuisine (but no meat or dairy)
Hobbies/Interests:	Reading, skiing, cinema, quizzing, dog walking

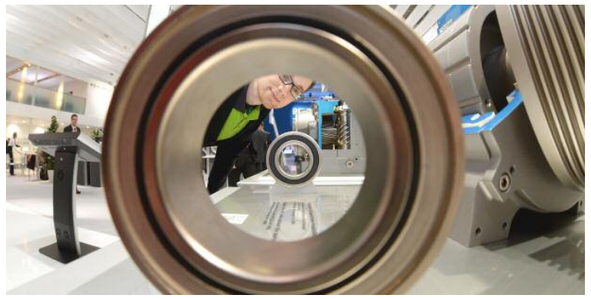
EXHIBITION NEWS

HANNOVER FAIR 2013
900 MAGNIFICENT SQUARE METRES AND A RECORD NUMBER OF VISITORS

SCHAEFFLER'S HUGE 900 SQUARE METRE EXHIBITION IN HALL 22 AT THE HANNOVER FAIR PROVIDED A PERFECT LAUNCH PAD FOR THE LATEST INNOVATIONS FROM THE GROUP.

Efficient, high-performance rolling and plain bearing components, innovative modules, comprehensive bearing support and linear guidance systems were at the core of Schaeffler's presentation at Hannover. The main focus was on improving energy efficiency while increasing power density and cost-effectiveness.

The stand contained a total of 65 exhibits and was staffed by nearly 100 Schaeffler experts across the five trade show days.



▲ Seeing things through - thanks to the preparation of exhibits and explanations from Schaeffler experts

A series of cutaway exhibits demonstrated technical solutions for specific applications including the Schaeffler Concept Motorcycle for the growing two-wheel vehicle market in Asia and South America and a full-size BR715 Turbofan aircraft engine.

◀ Interested visitors from all over the world came to the Schaeffler stand.

▲ Schaeffler's exhibition stand in Hall 22 at the Hannover Fair.

Dr. Bernard Heitzer from the German Federal Ministry of Economics and Technology with Robert Schullan, President Schaeffler Industrial.

In many cases multimedia presentations were used to help explain the exhibits. The largest multimedia display consisted of a 5m wide 'radar' touch screen wall showcasing Schaeffler's vision for the future in a virtual megacity.

The exhibition stand buzzed with life throughout the show with thousands of engineers, media representatives, and students visiting. With its experts and exhibits, Schaeffler was able to reach potential customers from over 50 industry sectors. ■

FAG SMARTCHECK VOTED MOST INNOVATIVE PRODUCT

SCHAEFFLER HAS RECEIVED THE 2013 IEN EUROPE AWARD FOR THE FAG SMARTCHECK.

The prize awarded by the industry magazine for the most innovative product of the last twelve months is traditionally presented during the Hannover Fair trade show.

IEN Europe has been providing information about new products and solutions for industry for more than 30 years. The editorial team chooses five products from this wide range of products and solutions that have been particularly well received. Readers select their favourites from these during an online poll.

The FAG SmartCheck received more than 30 percent of the votes making Schaeffler winner of the 2013 IEN Europe Award. Editor Juergen Wirtz presented the award during the Hannover Fair trade show.

The FAG SmartCheck is an innovative measuring system for the real-time monitoring of plants and machinery. Its compact dimensions and attractive price mean that smaller machines can be monitored cost-effectively for the first time ever.

Since its launch in 2011, the measuring device has been proving itself in a very wide range of applications such as vibrating screens, electric motors, fans and pumps. ■

▲ Product and Service Managers Diethelm Schueller and Volker Erberich received the award.

SCHAEFFLER UNVEILS CONCEPT MOTORCYCLE

SCHAEFFLER IS PIONEERING EFFICIENT AND COST-EFFECTIVE MOBILITY WITH A CONCEPT MOTORCYCLE FOR LOW TO MEDIUM PERFORMANCE CLASSES AT THIS YEAR'S HANNOVER FAIR.

Newly-developed components for engines, transmissions and chassis are geared towards the special requirements in the growing two-wheel vehicle market in Asia and South America.

There is a high demand here for energy-efficient, cost-effective and durable components in order to facilitate individual mobility for broad sectors of the population. As one of the leading suppliers for the global two-wheel vehicle market, Schaeffler is setting innovative trends here and is making consistent use of the synergy effects from its Automotive division.

The main trends in both sectors are the optimisation of the combustion process and mechanical efficiency as well as mechatronics and electric mobility.

"The optimisation of conventional drivetrains in motorcycles is an important factor for the mobility of the future, particularly in the densely populated urban centres of emerging nations. With our new components, we make an important contribution to reducing fuel consumption and emissions with high reliability, robustness and cost-effectiveness", says Juergen Stoelzle, Director of Schaeffler's Motorcycle sector.

Our new wheel bearing with a seal with optimised friction behaviour, our particularly high-performance but low-weight one-way starter clutch, and our chain drive system that has been specially adapted to the requirements of smaller motorcycles are excellent examples of how we achieve this." ■

NEW MATERIALS AND COATINGS INCREASE BEARING LIFE IN FOOD AND BEVERAGE APPLICATIONS

FOOD AND BEVERAGE

DR STEVE LACEY, ENGINEERING MANAGER AT SCHAEFFLER UK, DISCUSSES THE IMPORTANCE OF SELECTING A SPECIAL SURFACE COATING OR CORROSION-RESISTANT MATERIAL FOR BEARINGS OPERATING IN HARSH FOOD AND BEVERAGE ENVIRONMENTS.

In the food, beverage and packaging industries, production is typically based on highly automated, fast moving processes and systems, where every second of production counts. Avoiding unscheduled production downtime means that machine components such as bearings must be energy efficient, cost effective and capable of withstanding harsh, often highly corrosive conditions. For such applications, Schaeffler offers a wide range of robust, reliable bearings, which can all be corrosion protected, sealed and lubricated for life for continuous operation. Schaeffler is constantly developing new materials and surface coatings for bearings, to provide high levels of protection and longer operating lives.

Bearings to suit every application

Schaeffler's bearing range for food, beverage and packaging applications includes deep groove ball bearings, radial insert ball bearings, plain bearings, housed units, track rollers, slewing rings and linear guidance systems. All these products are designed to fulfil several key principles: compact design; maintenance-free operation; reliable, long operating life; modular components and sub-systems matched precisely to each other; and minimum number of interfaces through functional integration where possible.

Special materials and coatings

While Schaeffler's standard bearings guarantee optimum performance and a long service life, in many food, beverage and packaging environments, a standard bearing material or coating may need to be upgraded to prevent wear or corrosion of the bearing and to improve the service life. Schaeffler can advise customers when a coating is appropriate and what type should be used in certain applications.

▲ FAG deep groove ball bearings in a bottle labelling machine

In addition to special corrosion-resistant coatings such as Corrotect®, Schaeffler can also provide a range of corrosion-resistant materials for rolling bearings used in corrosive environments.

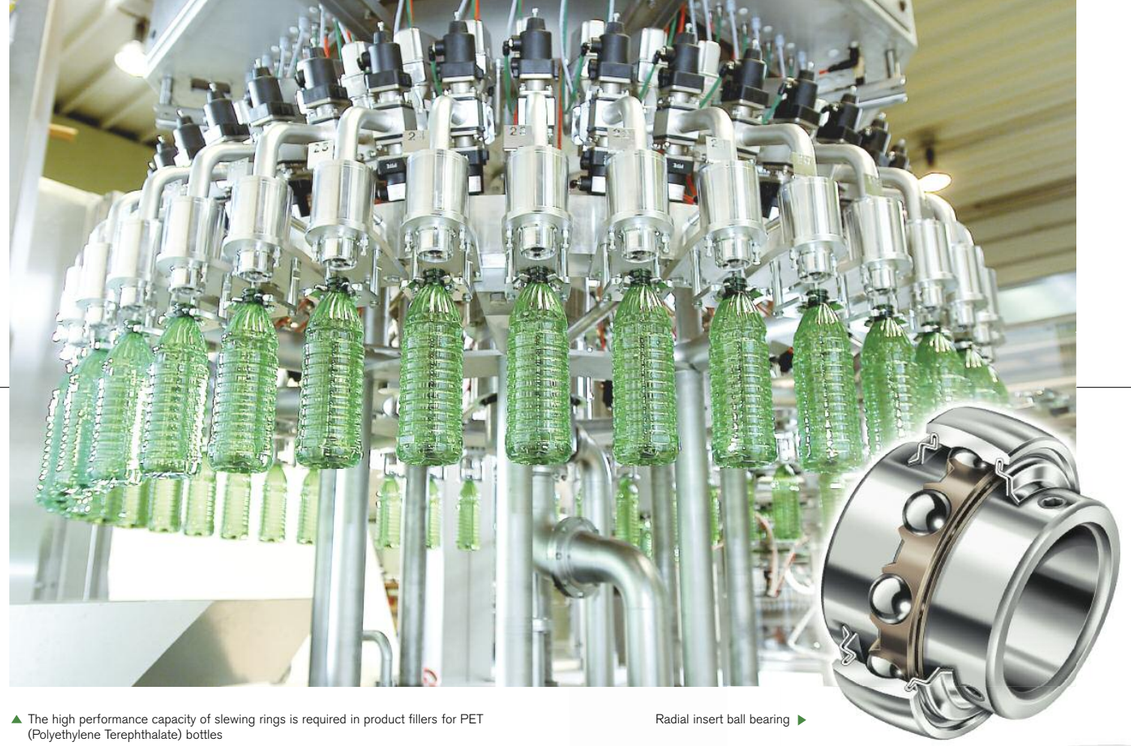
While standard steel bearing materials provide satisfactory corrosion resistance in many applications, for higher performance requirements, highly corrosion-resistant, nitrogen alloyed martensitic HNS (high nitrogen) steels – such as Schaeffler's Cronidur® and recently developed Cronitect® steels – are also available.

Cronitect® provides maximum corrosion resistance under extreme operating conditions such as dry running or aggressive media such as water, salt spray, acids and cleaning chemicals. Cronitect® steel is a high-grade martensitic hardening steel based on consistent refinement of high-grade corrosion-resistant steels.

Through its unique composition and new thermo-chemical surface layer treatment process, Cronitect® achieves an extremely high hardness. Even after 600 hours of salt spray testing in accordance with DIN 50021 SS, the material shows no signs of corrosion. Cronitect's resistance to corrosion is many times better than that of conventional corrosion-resistant steels.

The heat treatment optimises the surface zone and core properties of the base material. This produces a hard, wear-resistant surface zone with very high corrosion resistance and a tough core. Cronitect® is suitable for a wide range of industrial applications, particularly food and beverage processing (e.g. filling plants, fish processing and poultry production), materials handling, consumer products and packaging machinery.

▲ Schaeffler Cronidur® High Nitrogen steel



▲ The high performance capacity of slewing rings is required in product fillers for PET (Polyethylene Terephthalate) bottles

Radial insert ball bearing ▶

Bearings can be provided that combine conventional stainless steels such as AISI440C for the rolling elements with Cronitect® rings and bearing seals. In these configurations, the focus is on extended life under insufficient lubrication and on emergency operating features.

For example, bottling plants would typically need to replace all their AISI440C rolling bearings that come into contact with cleaning detergents every four months. With Cronitect® bearings, this interval can be doubled.

In a recent solution for a bottle capping machine company, Schaeffler replaced its original solution – a standard stud type track roller immersed in an oil bath – with a roller stud, Cronitect outer ring, corrosion-resistant steel balls and an HRS seal. This improved solution requires no lubricating oil, has extremely high resistance to corrosion and aggressive media, while presenting no risk of contamination of foodstuffs. This has resulted in improved hygiene, reduced maintenance costs and higher machine availability.

Ceramics and plastics

Other special bearing materials include ceramic rolling bearing components, which provide excellent characteristics for certain applications. Silicon nitride balls, for example, are light and offer a longer operating life than standard steel ball elements. High performance plastics such as PEEK can also be used for bearing components operating in corrosive environments.

PEEK is resistant to high temperatures and, depending on the load, is suitable for operating temperatures of up to 250°C.

The wear resistance is strongly influenced by the filler materials and is significantly better than that of the standard material PA66 with glass fibre reinforcement that is often used for bearing cages.

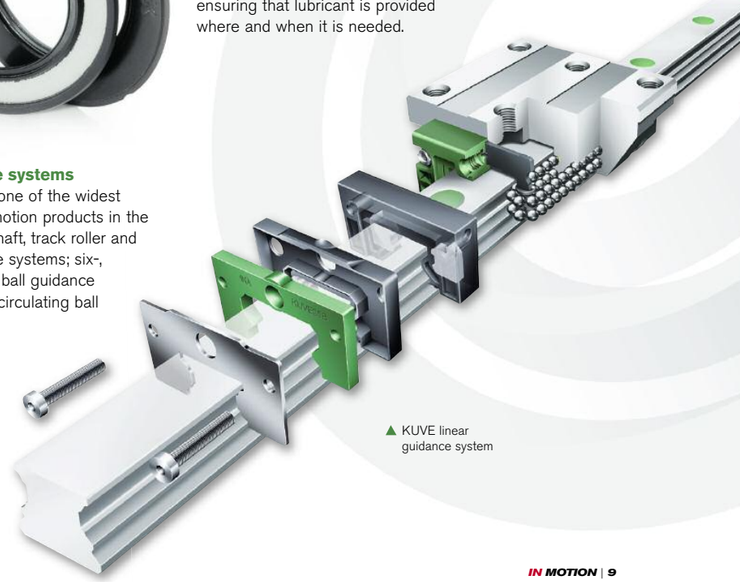
▲ HRS seals

Linear guidance systems

Schaeffler offers one of the widest ranges of linear motion products in the world, including shaft, track roller and monorail guidance systems; six-, four-and two-row ball guidance systems; linear recirculating ball bearing units; miniature guidance systems; linear actuators and linear tables; ball and roller screw drives; and a range of linear accessories such as fasteners and connectors.

For food and packaging applications, Schaeffler's KUVE-KIT for linear recirculating ball guidance systems is highly recommended. This finely matched sealing and lubrication concept takes account of all ambient conditions. The kit contains versatile components such as front and additional wiper seals, sealing strips and long term lubrication units.

These accessories protect the guideways from contamination and provide long relubrication intervals, ensuring that lubricant is provided where and when it is needed.



▲ KUVE linear guidance system

LLANELLI

SUCCESSFUL AUTOMATION PROJECTS RELY ON A BLEND OF YOUTH AND EXPERIENCE

OVER THE LAST THREE YEARS, A TEAM OF ENGINEERS AND APPRENTICES AT SCHAEFFLER UK'S MANUFACTURING PLANT IN LLANELLI, SOUTH WALES, HAS SUCCESSFULLY IMPLEMENTED A RANGE OF NEW AUTOMATION SYSTEMS ACROSS THE PLANT.

These systems have helped to improve the efficiency of individual machines and complete production lines, as well as helping to reduce manual handling, remove bottlenecks from production and reduce manufacturing throughput times.
The team itself comprises three engineers, all of who began their careers at Llanelli on the apprenticeship scheme. The team, which was established in 2010, possesses a blend of engineering skills and experience to help tackle every type of automation project that the plant requires.

The team also boasts a combined experience of 57 years at Llanelli. Darran Williams (automation technician and team leader) has worked at the plant for 25 years, Mark Williams (CNC machining specialist) for 17 years and Grant Nicholas (fabrication specialist) for 15 years. Darran and Mark have been part of the automation team from the beginning, with Grant joining two years ago.

And who have all come up through that company's apprenticeship scheme? It's truly amazing and demonstrates Schaeffler's commitment to its workforce and the value the company places on recruiting new apprentices every year."

Established in 1955, the plant in Llanelli manufactures high precision engine components (mostly mechanical tappets) for the automotive market. The plant employs 250 people, including seven engineering apprentices and one graduate trainee. Two of the apprentices work in the toolroom, the other five in maintenance and production.

The production environment is fast-paced and highly automated. In the last two years, the company has invested several million Euros in new surface coating technology for tappets, as well as a 66-tonne deep drawing press, which enables the plant to produce highly repeatable, superior quality tappets for automotive OEMs.

Around 90% of components used in these automation systems are designed and manufactured in-house at Llanelli. These include linear guides and shafts, fasteners, bearings, fixing and mounting systems, and support frameworks. Other components such as electric motors, gearboxes, sensors are bought-in.

As Darran Williams states: "The automation projects team requires many different skills: electrical, mechanical, hydraulics and pneumatics, fabrication, machining, welding and toolmaking. We also need people who can work in a team and who can look at a problem and then go away and find the most appropriate solution. For current apprentices such as Daniel [Summers], this kind of project experience is invaluable and has helped to develop his toolmaking and problem-solving skills."

This move towards using standard, automation components has helped to support new machine optimisation projects, where groups of CNC machines have been 'linked' via a single feed-in conveyor system. This has helped to 'synchronise' production and improve plant throughput.

"In terms of solutions, everything was bespoke," says Darran Williams. "For example, we used many different sizes of conveyors. We now choose from just five sizes, which minimises stock and simplifies maintenance and repair."

Neil Walters: "In terms of developing new skills and career progression, the apprentices here get the opportunity to work on some of the most technologically advanced production machines in the world. It's exciting for the apprentices but also shows how much we trust and believe in them."

"With all our apprentices, over the first two years you begin to see how they are developing, what they like and dislike and what they are really good at. Our task is to then put in place training programmes to develop their skills accordingly." ■

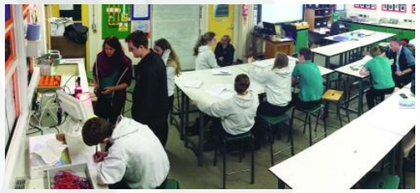
▲ Left to right: Mark Williams, Grant Nicholas, Darran Williams, Daniel Summers.

Periodically, the team receives extra help from its own pool of apprentices – this year Daniel Summers, a toolroom apprentice in his fourth year of the apprenticeship, has been helping out.

Neil Walters, Production Support Manager at Llanelli, oversees the automation projects: "These days, how many UK manufacturing companies can you walk into and find a team of three engineers with a combined 57 years' experience working for that plant?

The automation projects at Llanelli therefore vary in size and duration, from small, one-week projects to larger projects that can last for several months. Examples include the design and implementation of new conveyor systems, parts transfer and feed-in systems for various types of machinery, including CNC machines, heat treatment furnaces and washing stations. The projects themselves typically arise from Continuous Improvement initiatives.

SEVEN EESW AWARDS IN SUCCESSION FOR GWYR SCHOOL



A TEAM OF STUDENTS FROM SWANSEA HAS WON 'MOST INNOVATIVE SOLUTION TO THE PROJECT SET' FROM THE ENGINEERING EDUCATION SCHEME WALES (EESW) FOR DEVELOPING A UNIQUE METHOD OF DETECTING DEFECTS AT SCHAEFFLER UK'S PLANT IN LLANELLI SOUTH WALES.

This is not the first success we've had as a school in the EESW competition," enthuses Rhys Browning, Head of Physics at Ysgol Gyfun Gwyr School in Gowerton, Swansea. "We've now won awards some seven years in succession, for which we are very appreciative towards Schaeffler for their support during these years."

Schaeffler's plant in Llanelli produces engine components for the automotive market.

This year, Schaeffler worked with a mixed team comprising: Elis Rees, Jac Reid, Tara Beynon, Natalia John, Cadi Rhind, Nia Thomas, Ffion Wathan and Dylan Morgan. The students were first given a guided tour of Schaeffler's manufacturing plant, before being shown six potential projects to choose from.

Derrick Lewis, Technology Manager at Schaeffler UK and key contact at the company for EESW projects, describes how this year's project was selected:

▲ The eight team members

The plant has supported EESW since the scheme was first introduced across Wales in 2007. The plant acts as an EESW 'link' company and so devotes time and resources in advising students on their selected projects.

As a nationwide scheme in Wales, EESW is helping to enlighten young people about the challenges and opportunities presented by the four STEM subjects: Science, Technology, Engineering and Mathematics.

This is carried out each year through a project involving schools across Wales and industry. The aim is to encourage students to study STEM courses in higher education and to take an interest in engineering as a career.

The scheme operates through local companies, who set teams of A-Level students project briefs relating to actual industrial problems. Over a period of six months, the students then work together to solve these challenges by cooperating with engineers from the link companies.

"This year, we wanted to ensure that the students had maximum buy-in to the project from the outset. We therefore gave the team the opportunity to select the project that enthused them the most."

But there was one other key success factor, says Lewis. "This year, we also decided to train the team in project or time management skills, which we felt were critical. The tools and techniques that we trained the students in were applied very well throughout the duration of the project. In my opinion, these skills were key to the team's overall success this year."

The challenge was to devise a low cost method of detecting defects in raw material, in this case, 1.5 tonne coils of steel used in the production of mechanical tappets at Llanelli. The second stage of the project was to develop a prototype system that illustrated the method of operation in the production environment.

The students developed a low cost inspection system that comprised a vision and colour recognition system to detect a variety of surface defects on the incoming steel strip. These defects are not manufacturing defects but normally arise during transit. The defects may appear as small indentations, scuffs or scratches.

The prototype system comprised a single vision system/camera that is able to detect slight changes in the colour of the steel. A normal, defect-free surface appears as grey on the vision system's colour scale, but a defect appears as white on the colour scale. The vision system is able to inspect the steel reliably even at high production rates.

In practice, says Lewis, a production-ready version of the system would require four cameras in order to view all aspects of the steel coil or bar as it is fed to the forging press. "However, the objective of the prototype system was to prove the principle, which it certainly did," says Lewis.

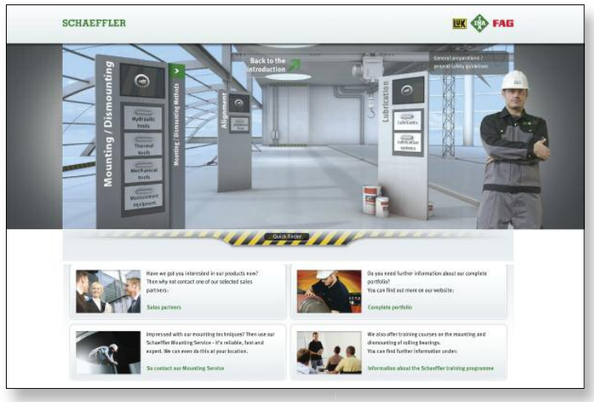
The team was rewarded for its endeavour. On 20th March 2013, the students attended the EESW's annual South Wales awards and presentation ceremony held at The Celtic Manor Resort, Newport. The team's prototype scale model solution was on display, along with a written report and presentation. The solution was awarded the 'Most Innovative Solution to the Project Set' prize. ■

▲ The vision system on display at Celtic Manor

INTERACTIVE

NEW ONLINE GUIDE TO MOUNTING ROLLING BEARINGS

SCHAEFFLER HAS LAUNCHED AN ONLINE, INTERACTIVE INFORMATION GUIDE ON HOW TO CORRECTLY INSTALL ROLLING BEARINGS AND THE TOOLS REQUIRED.



The correct mounting and dismounting of rolling element bearings can save time and dramatically increase the life of bearings, as well as maximising the availability of critical plant and machinery by avoiding costly breakdowns. The key is to ensure that the appropriate tools and equipment for the mounting and dismounting of rolling bearings are on hand for the engineer at the installation or assembly stage. Appropriate tools may include thermal mounting and dismounting tools such as induction heating devices and heating plates, mounting paste and heating rings, as well as feeler gauges, hydraulic extractors, hydraulic nuts and hand pump sets. Using the correct tools ensures that bearings are mounted and removed easily and quickly without causing damage to the bearings or surrounding equipment and in a safe and reliable way.

The new **Schaeffler Mounting Toolbox** is a web-based information guide on how to professionally install rolling bearings. As well as learning about which tools and fitting aids are required to install rolling bearings, users can also view short videos that demonstrate how these tools should be used in practice.

On entering the website (http://mounting-toolbox.schaeffler.com) users are presented with a 'Virtual Plant' home screen, which serves as the main user interface, allowing fast navigation around the website and easy access to the information provided. The objective is to make users feel that they are actually in a factory, looking over the shoulder of a professionally-qualified mounting service technician, who is demonstrating how to correctly mount the bearings.

The website provides details of mounting tools and accessories, and demonstrates the benefits of correctly mounted rolling bearings, which include longer operating life for the bearing, reduced unplanned downtime, and higher machine availability.

Moreover, correct alignment and lubrication can achieve improved energy efficiency of machines and equipment.

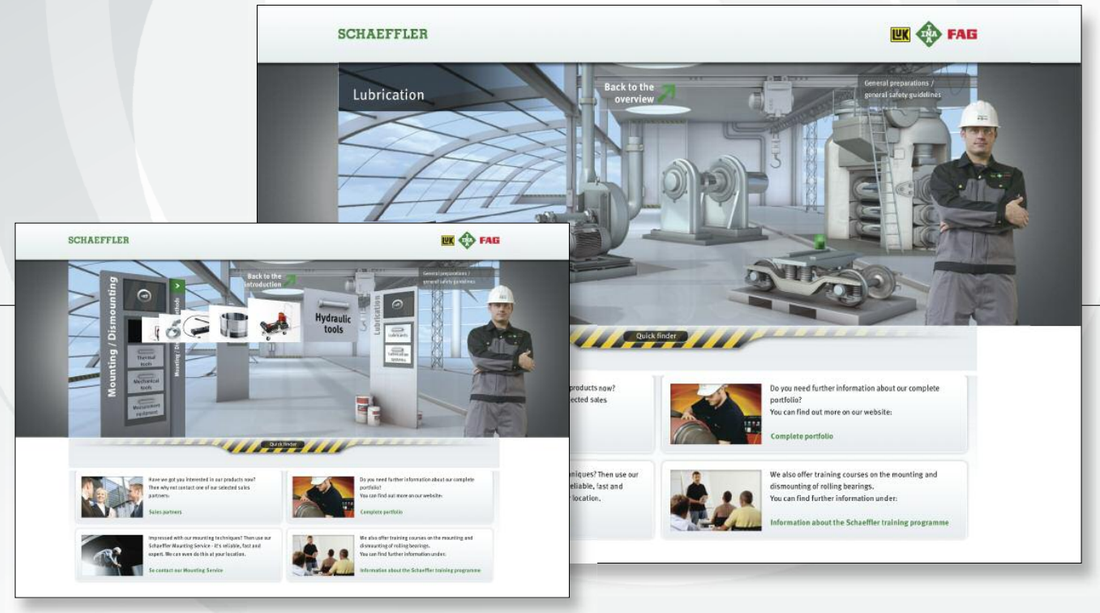
Topics Divided into Three Pillars

The Virtual Plant comprises three pillars that represent the main topics of the Mounting Toolbox: 'Mounting/ Dismounting', 'Alignment', and 'Lubrication'.

On each of these pillars, sub-categories are displayed as drawers in the pillars and can be opened with a simple click of the mouse. These drawers contain the appropriate tools and fitting aids shown in the demonstration videos. The user is also given an insight into the different mounting methods, as well as general safety guidelines and preparations.

Videos Show Mounting Experts in Action

To view the videos and get an insight into professional mounting techniques, users simply click on the camera symbol on the relevant pillar. The pillars then disappear and five machines will appear in their place. By clicking on one of the machines, the user can zoom in and view the rolling bearings it contains. The experts then demonstrate how these bearings should be mounted and dismounted in short video film sequences.



Access the information you need quickly

Internet access is all that users require to visit the Virtual Plant and to learn more about rolling bearing mounting.

The sub-categories are displayed on the pillars, drawers and machines to present a clear structure to users. An additional navigation option provides a quick overview of all topics at a glance.

The Mounting Toolbox is currently available in four languages: German, English, Russian and Spanish. ■

APP TIME

LEARN MORE ABOUT SCHAEFFLER'S RANGE OF PRODUCTS AND SERVICES, OR EXPLORE ITS 25-YEARS OF MOTORSPORT HISTORY IN TWO INNOVATIVE SMARTPHONE APPS.

SCHAEFFLER INFOPOINT APP FOR IOS AND ANDROID

THE INFOPOINT APP ALLOWS USERS TO ACCESS CONCISE INFORMATION ON CURRENT SCHAEFFLER DEVELOPMENTS, PRODUCTS AND CAREER OPPORTUNITIES.

About Schaeffler
Here you can receive information about Schaeffler, and the INA, FAG and LuK brands.

Schaeffler Library
A virtual library feature in the app provides users with a wide range of publications and catalogues that can be used online or are available to download.

Careers
Students, graduates and those with work experience can find information on careers with Schaeffler, relevant contacts, how to apply, FAQs etc. ■

SCHAEFFLER QUARTETS NOW WITH MULTIPLAYER MODE

NEW FUNCTIONS FOR THE POPULAR MOTORSPORT QUARTET APP FROM SCHAEFFLER

Schaeffler has invited enthusiasts to explore its more than 25 years of history in motorsport via the Motorsport Quartet App. Thousands of users have already downloaded the free App on their iPhones. To the delight of all Quartet fans, there is now an update: In the new multiplayer mode, you can now test your skills and go head-to-head with 'real' opponents.

The Quartet playing cards show 44 cars, with which Schaeffler partners have celebrated victories on race and rally tracks. The target is to use the technical data of the cars in such a way that you 'steal' your opponent's cards. Now, your opponent is no longer the computer. With the new multiplayer mode, you can now accept a rival's challenge via the iPhone Bluetooth connection.

The Schaeffler Motorsport Quartet can be found in the App Store by searching for 'Schaeffler Quartet'. ■

AUTOMOTIVE

NEW SCHAEFFLER AND FORD UNVEIL CONCEPT FIESTA WITH SPACE-SAVING ELECTRIC WHEEL HUB DRIVES

FORD HAS UNVEILED A NEW CONCEPT FIESTA PASSENGER CAR THAT UTILISES SCHAEFFLER'S INNOVATIVE ELECTRIC WHEEL HUB DRIVE SYSTEM, THE E-WHEEL DRIVE.

The highly integrated, liquid-cooled wheel hub drive has a total weight of just 53kg and is compact enough to fit inside a 16-inch wheel rim.

The E-Wheel Drive was presented at the recent 'Auto, Motor und Sport' congress in Germany. This co-development between Schaeffler and Ford was on display in a new concept car based on a Ford Fiesta. The vehicle is driven by two Schaeffler E-Wheel Drives installed in the rear wheel arches. All components required for drive, deceleration and driving safety – including the electric motor, power electronics, controller, brake and cooling system – are installed inside the wheel rim in the highly integrated wheel hub drive.

Increased output and torque

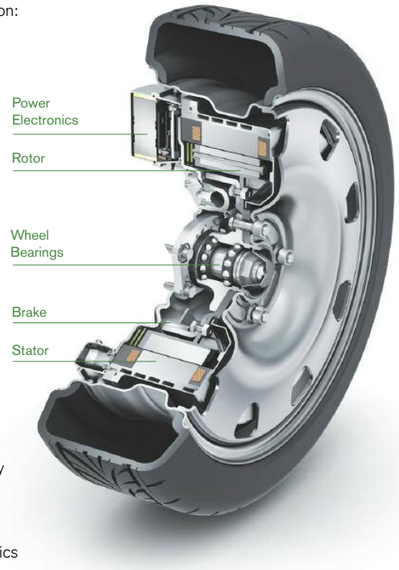
The wheel hub drives provide an output of 40kW per drive, with a continuous output of 2 x 33kW, which is equivalent to 110hp and 90hp respectively. The wheel hub drive, now in its second (Beta) stage of development, delivers a torque of up to 700Nm. Compared to the first-generation (Alpha) wheel hub drive – first unveiled in Schaeffler's Corsa-based 'Schaeffler Hybrid' concept car in 2010 – the E-Wheel Drive Beta version offers a 33% higher output, as well as a 75% increase in torque. The electrical voltage of the high-voltage drive is 360-420V.

"Overall, we were able to reduce the vehicle weight once again," stated Dr. Raphael Fischer, Director of the Wheel Hub Drives Product Group in Schaeffler's eMobility Systems Division. "This is because, as well as liquid cooling, the power electronics and controller are now also integrated to the wheel, which means that complex wiring in the vehicle can be omitted."

At the Auto, Motor und Sport Congress, Prof. Peter Gutzmer, Member of the Executive Board and CTO at Schaeffler, gave his assessment of the new drive technology innovation: "The B-segment vehicle serves as a pre-production model. However, wheel hub drives have to be integrated into new vehicle concepts in order to demonstrate their strengths to the full."

"Thanks to this highly integrated wheel hub drive, we can now re-think the city car without any restrictions. It will be a key factor in new vehicle concepts and automotive vehicle platforms in the future. For electric vehicles in urban environments – which may become obligatory in many densely populated areas – the wheel hub drive enables significant space savings to be made. In these new vehicle concepts, all components relating to propulsion, braking and driving safety are housed inside the wheel. The vehicle platform therefore provides maximum space for passengers, luggage and for the battery, electronics and communication systems. Vehicle manufacturers can also use this as a basis for creating a range of different body designs. Automotive vehicle manufacture originally started in just the same way."

The unveiling of the E-Wheel Drive development vehicle – designed in close cooperation with Ford Research & Advanced Engineering Europe – was a welcome break from the vehicle's otherwise busy test schedule, which has included extensive test drives in the cold climate of Scandinavia.



These winter tests were part of a comprehensive development and test programme in which driving dynamics also played a critical role.

"Excellent driving dynamics are among the main attributes of Ford vehicles. Our expertise and experience in this area was also key during this project.

The test drives have clearly shown that the driving behaviour of this test vehicle in terms of comfort and safety has remained at virtually the same level, despite the higher wheel-sprung masses compared to the conventional basic vehicle," explained Roger Graaf, Project Manager at Ford Research & Advanced Engineering Europe.

What is more, the Fiesta E-Wheel Drive displays extraordinary dynamics. In addition to regulating the stability of the driving dynamics, the two wheel hub drives also enable 'torque vectoring' – the selective distribution of torque to the wheels.

"In this way, highly integrated wheel hub drives also provide significant advantages in terms of maneuverability, driving dynamics and active safety, as well as perfect utilisation of space. This will play a significant role in the future, particularly in combination with independent driving," commented Prof. Gutzmer.

"The electric wheel hub drive therefore has the potential to become one of the drives of the future and a valuable addition to the range of drives that, from a global point of view, will continue to be governed by increasingly electrified drive trains based on internal combustion engines," he added. ■

▼ Schaeffler E-Wheel Drive on display in a development vehicle created in cooperation with Ford and based on a Ford Fiesta.

NEW SENSOR DETENT DETECTS NEUTRAL AND REVERSE GEAR POSITIONS IN ENGINE STOP-START SYSTEMS

SCHAEFFLER HAS DEVELOPED A NEW HIGHLY INTEGRATED SENSOR SYSTEM FOR DETECTING NEUTRAL AND REVERSE GEAR POSITIONS IN MANUAL TRANSMISSION SYSTEMS.

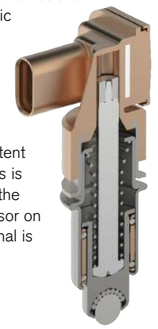
The system is currently available for use in advanced engine stop-start (ESS) systems.

Most first-generation neutral gear detection systems comprise an add-on sensor with a separate magnet fitted to three separate mounting positions. However, the new Schaeffler sensor detent requires no add-on components and is installed in just one mounting position. The highly integrated design of the sensor detent also means that the selector shaft and housing no longer require additional machining for mounting. The sensor element reliably detects the selected drive position and sends this information to control units incorporated in the vehicle. The sensor detent is characterised by high component functional integration and is the result of continuous development of existing components to include new functions.

New demands

The electrification of engine drive trains for internal combustion engines; new advanced ESS systems; the development of hybrid electric vehicles; and the automation of vehicle systems, are placing new demands on manual transmission systems. Whereas the first generation of ESS systems is still based on traditional components, the next generation of ESS systems will be integrated in the vehicle's information highway, creating significant potential for improvements in driver comfort and vehicle energy efficiency.

Traditional sensor detents have always been part of Schaeffler's product range. Schaeffler works closely with automotive OEMs worldwide in developing solutions for customising the gearshift "feel" of manual transmissions to meet the needs of specific vehicle brands and models.



The Schaeffler sensor detent combines an existing detent with a sensor that measures lift. The forced stroke of the detent that occurs during gearshifts is recorded and processed in the gearshift unit using the sensor on the detent. The relevant signal is outputted to an integrated connector.

Depending on vehicle requirements, the sensor can handle pulse width modulation (PWM) or single edge nibble transmission (SENT) protocols and can also output analogue signals. The sensor detent positions the gearshift unit in neutral in all shift gates and simultaneously detects this position, which ensures high accuracy.

By operating in conjunction with the second gearshift detent, the system enables customer-specific demands to be met in terms of gearshift and selection forces, as well as improving gearshift comfort for the driver.

The Schaeffler sensor detent uses a non-contact, wear-free sensor to detect neutral gear position. The sensor detent also detects reverse gear position and outputs the relevant signal, which means the contact reverse light switch and all mechanical interfaces are no longer required. By standardising the electronics and programmability of the sensor, the sensor detent can be easily adapted to suit the specific requirements of the vehicle.

▲ Shift system with Schaeffler sensor detent

"The new sensor detent offers a highly integrated solution for detecting neutral and reverse gear for manual transmissions and it creates one of the prerequisites for engine stop-start systems," comments Stanislav Massini, Director of Advance Development and Mechatronics at the Shift Systems Product Line at Schaeffler. "Its high level of integration means that some components, various mounting elements and some stages of the manufacturing process are no longer required."

The sensor detent plays an important part in reducing vehicle fuel consumption and engine emissions, while also cutting vehicle weight and costs. The sensor detent is already in volume production at Schaeffler and is currently available for engine stop-start applications. ■

A GUIDE TO MATERIAL SELECTION FOR ROLLING BEARINGS

MATERIALS

BY OFFERING A WIDE CHOICE OF MATERIALS AND HEAT TREATMENTS FOR ROLLING BEARINGS, PERFORMANCE AND OPERATING LIFE CAN BE OPTIMISED, EVEN FOR THE MOST DEMANDING INDUSTRIAL APPLICATIONS

In recent years, there has been a significant increase in demand for rolling bearings that, even under extreme operating conditions – including lubricant starvation, highly corrosive or high temperature environments – still provide a long operating life and optimum performance. But selecting a suitable material or heat treatment process for rolling bearings often requires expert advice and guidance. Selection depends on the application itself and the operating environment. This means a number of factors require careful consideration, such as the mechanical, chemical and thermal requirements placed on the bearings, as well as lubrication conditions.

There is a key role here for the type of materials used for the various bearing components and how these interact. Some of these materials are industry-recognised standard steels (in rolling bearing quality), but others may need to be specially developed or might involve special surface or heat treatment processes to give the material a set of characteristics that are deemed critical for the application.

Standard rolling bearing steels

For most industrial applications, standard through hardened rolling bearing steel (100Cr6) is sufficient. This versatile material is heat treated (martensitic-hardened and tempered at low temperatures), which provides consistently high hardness (between 62 and 64 HRC) distributed over the circumference and cross-section. The main attributes of this material are high hardness and wear resistance, as well as good resistance to over-rolling. Depending on the wall thickness of the components,

it may be necessary to use a higher-grade alloy to take account of hardenability.

The material also permits operating temperatures up to 120° C, with some grades offering up to 200° C. Typical applications include small combustion engines and fan bearings for steel mills.

A slight variation on the above is bainitic hardened 100Cr6 steel. With this material, there is a considerable reduction in the risk of crack formation, even with surface damage. Typical applications for these bearings include wheelset bearings for bucket wheel excavators and trams.

Case hardened steel (St4) in rolling bearing quality has good forming characteristics and provides high hardness and wear resistance, as well as good resistance to over-rolling. This material is suited to small components, such as universal joints and drawn cup needle roller bearings with closed ends.

If there is a high risk of particle over-rolling and poor lubrication conditions (e.g. refrigerating compressors, gearbox bearings for construction/agricultural machinery), carbonitrided steel (100CrMnSi6-4) is the preferred choice. This material is heat treated to provide excellent dimensional stability and hardness up to 66 HRC in the outer functional layer.

Wind turbines and trucks

A material that is used primarily for medium and large sized rolling bearings, including wind turbine main rotor bearings and wheelset bearings for trucks is case hardened (carburised and martensitic hardened) steel, which offers hardness up to 64 HRC in the form of a hard surface layer with a tough core. This treatment provides residual compressive stresses in the surface layer, providing increased fracture resistance or surface damage, as well as reduced crack formation with surface damage.

Nitrogen alloyed chromium steel (e.g. Schaeffler's Cronidur® 30) is a material that is martensitic hardened and tempered at low (or possibly high) temperature. This material provides excellent corrosion resistance, particularly against aggressive chemicals and acids.

Operating temperatures are typically up to 150° C. Main areas of application are bearings that are subjected to high loads, lubricant starvation, dry running, media lubrication and corrosive environments.

Corrosion-resistant, case hardened steel (surface layer nitriding) provides rolling bearings with even better resistance to corrosion and significantly improves resistance to over-rolling. Schaeffler's Cronitect® steel, for example, has found numerous applications in food processing, as well as in sports and fitness applications.

Special materials

Where current insulation and high wear resistance are important considerations, oxide-based ceramics (e.g. zirconium oxide ZrO2) are ideal. These sintered materials can be used in temperatures up to 600° C, with typical hardness ratings in the region of 1400 HV and a density between Si3N4 and steel. The material is normally only used for the rolling elements that are in contact with steel-based bearing rings. Main areas of application are where the bearings are subjected to low loads (hybrid bearings), lubricant starvation, dry running, media lubrication and corrosive environments.

The new FAG high-tech Cronitect® hybrid rolling bearing

In certain food processing applications and for machine tool spindle bearings, silicon nitride-based ceramic rolling elements can be specified. The advantages of this material include its reduced mass and ability to withstand higher operating temperatures (up to 700° C), as well as high speed capacity, current insulation, very high wear resistance, reduced friction and increased grease operating life.

Steel rolling mill bearings and some marine propulsion systems use case hardened rolling bearing steel (to DIN EN 10084). Examples here include 17MnCr5 and 17CrNiMo7-6. ■

SCHAEFFLER DESTROYS 26 TONNES OF COUNTERFEIT ROLLING BEARINGS

ANTI-COUNTERFEITING

FOLLOWING A SIMILAR OPERATION IN 2007 IN WHICH 40 TONNES OF COUNTERFEIT ROLLING BEARINGS WERE SEIZED, SCHAEFFLER HAS DESTROYED A FURTHER 26 TONNES OF COUNTERFEIT BEARINGS WITH A VALUE OF MORE THAN ONE MILLION EUROS.

On this occasion, the bearings were destroyed at the premises of Interseroh Franken Rohstoff, a metal recycling company based in Schweinfurt, Germany.

A large proportion of the counterfeit Schaeffler bearings were seized in raids on bearing distributors across Europe, including Italy, Germany and the UK. "Brand and product piracy is not something that is limited to China or South East Europe. It also takes place right on our doorstep," said Ingrid Bichelmeir-Böhn, leader of the Global Brand Protection Team at Schaeffler. "The German and European markets are no longer flooded with just counterfeit luxury and consumer goods, there has also been an increase in counterfeit safety-critical industrial products such as rolling bearings."

The recent seizure and subsequent process of destroying the various sizes and types of counterfeit rolling bearings involves crushing the bearings in a scrap press. The press breaks up the bearings into smaller pieces, damaging them so much that they are rendered unusable. Larger sized bearings with an outside diameter of more than one metre, which were too large for the scrap press, were destroyed manually using a blowtorch.

The spindle bearings, spherical roller bearings, ball bearings and needle roller bearings scrapped during this operation were part of a much larger seizure of confiscated counterfeit products. The majority of these products were disposed of locally under the supervision of the relevant German national authorities.

Worldwide, Schaeffler is taking ongoing action against the counterfeiting of rolling bearings and the distribution of these products, which in some cases leads to prosecution. Not only is there a threat of claims being made under civil law for 'cease and desist orders', damages and the submission of counterfeit products for destruction, but there is also a threat of prosecution under criminal law, which could lead to a fine and/or imprisonment.

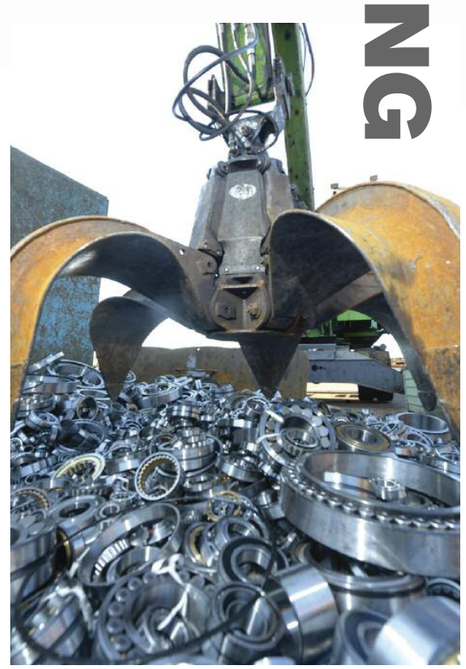
The economic losses caused by counterfeit products are difficult to estimate. As well as lost sales and damage to the image of the bearing manufacturer, high costs are also incurred for investigating, confiscating and correctly disposing of counterfeit bearings.

Not only is damage caused to legitimate companies that research, develop and manufacture bearings, but also to those companies that install counterfeit components and to their customers. A recent case in Switzerland proved once again that significant damage can be caused by the failure of a rolling bearing, particularly if the bearing is a safety-critical component on a machine or production line.

The customer in Switzerland complained that a counterfeit cylindrical rolling bearing was fitted during the repair of one of its machines. Despite regular maintenance, hot running of the bearings occurred after just six months. This was recognised in good time by the customer, but the issue still resulted in repair costs of around 17,000 euros, which far exceeded the value of the bearings.

Trade associations such as the World Bearing Association (www.stopfakebearings.com), the German Anti-Counterfeiting Association (www.markenpiraterie-apm.de) or the Quality Brands Protection Committee (www.qbpc.org.cn) ensure that the public is informed about the risks caused by the use of counterfeit industrial products.

These organisations also work closely with national authorities to create the required legal and organisational framework to effectively fight counterfeit products and to protect manufacturers and their customers. ■



RENEWABLES

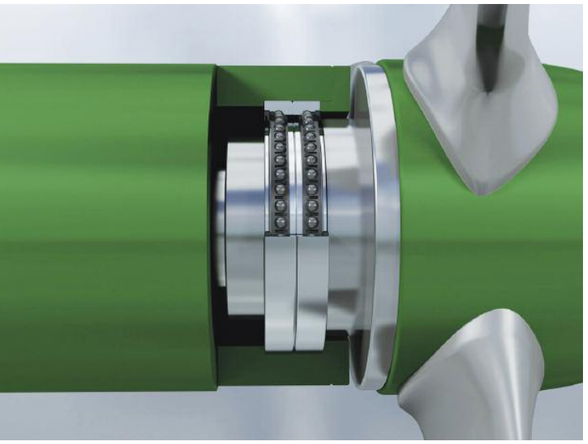
WATER POWER: CORROSION-RESISTANT AND MEDIA LUBRICATED ROLLING BEARINGS

WATER POWER WILL MAKE A SIGNIFICANT CONTRIBUTION TO SUPPLYING RENEWABLE ENERGY IN THE FUTURE. THIS APPLIES TO CONVENTIONAL APPLICATIONS SUCH AS HYDRO-STORAGE PLANTS, PUMPED-STORAGE PLANTS, AND RUN-OF-THE-RIVER WATER POWER PLANTS AS WELL AS NEW TYPES OF MARINE WATER POWER.

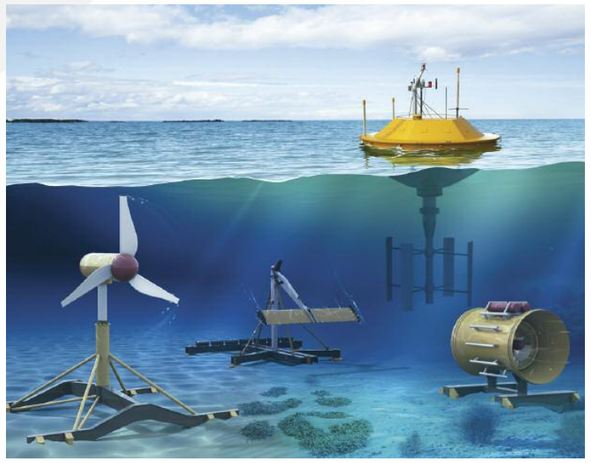
Schaeffler has been a respected, close development partner and supplier to "conventional" hydropower for many years. Applications in tidal stream and wave power are now also becoming increasingly important. Special bearing solutions are required for turbines, floating bodies, buoys or oscillating hydrofoils, depending on the concept.

Non-hermetic seals and omission of lubricant

The ambient conditions in and under water mean that special requirements are placed on the bearing support. For these applications, Schaeffler develops bearing supports that can be directly installed in water. The water is the medium that provides the lubrication. Schaeffler uses a special steel that is resistant to corrosion for the rolling bearing rings, while the rolling elements are ceramic and the cages that guide the rolling elements are manufactured from special, water-resistant plastics.



▲ Schaeffler uses a special steel that is resistant to corrosion for the rolling bearing rings, while the rolling elements are ceramic and the cages that guide the rolling elements are manufactured from special, water-resistant plastics. These are in addition to non-hermetic, light seals that allow water to enter the bearing but keep particles away from the rolling contact.



▲ Concepts for utilising tidal energy: Axial and radial turbine, axial turbine using the Venturi effect, oscillating hydrofoils.

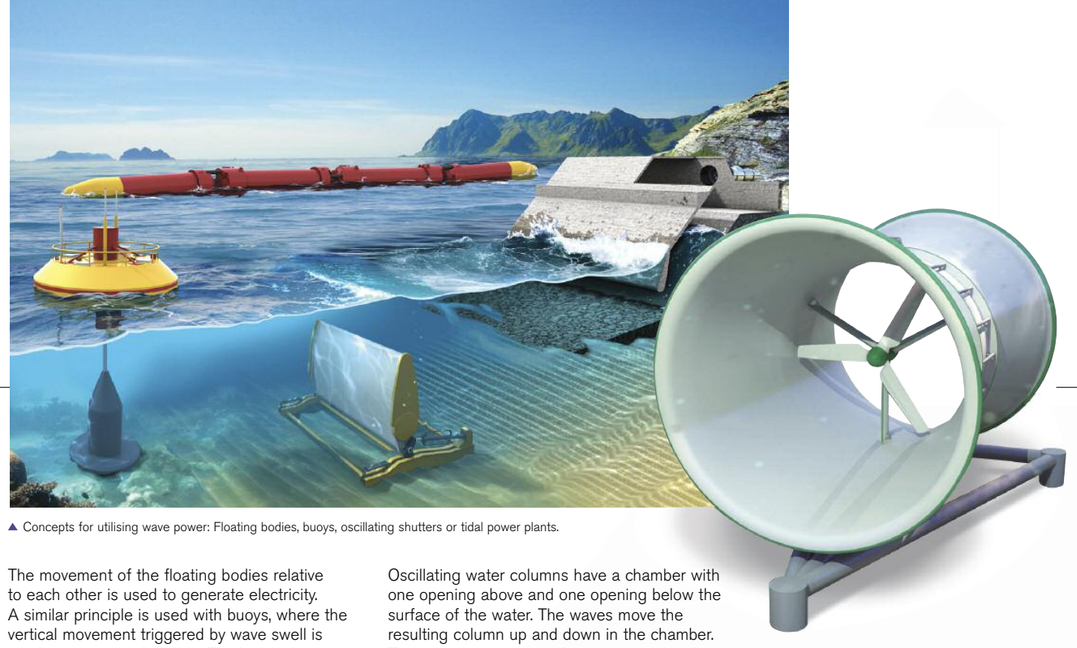
These are in addition to non-hermetic, light seals that allow water to enter the bearing but keep particles away from the rolling contact. Schaeffler is able to use decades of experience in materials technology, surface coating and seal technology for these developments.

Schaeffler does not use heavy seals that cause considerable friction. This means plants can be operated in a much more energy-efficient manner. There is no need to use oil and grease because the rolling bearings are lubricated by water. This is a major benefit in ecological terms when used in water. Reliability and low maintenance requirements play an important role in all solutions since once the plants are installed under the surface of the water, access to them is limited and they must be lifted to the surface to enable maintenance work to be carried out.

The first prototypes of media lubricated rolling bearings are already in use in pilot projects, for example, in North America.

Concepts for tidal stream and wave power plants

Axial turbines are installed under water to utilise the energy from currents and tides. In the same way that a stream of air moves the rotor in a wind turbine, in a tidal power plant the current moves the rotor that generates electricity. An axial turbine is a modification of this principle that uses the Venturi effect. During this process, the water is fed through a tapered pipe. This increases velocity of the water as well as the energy output. Concepts that use radial turbines are similar to those with axial turbines. Oscillating hydrofoils are another principle for using the energy from tidal current. The inclination angle can be adjusted so as to enable the current to produce up and down movement of the hydrofoil, which is similar to a dolphin's tail fin. This movement is used to generate electricity. Various concepts are also currently being developed to utilise wave energy. For example, one system uses several floating bodies on the surface of the water that are linked together with joints.



▲ Concepts for utilising wave power: Floating bodies, buoys, oscillating shutters or tidal power plants.

The movement of the floating bodies relative to each other is used to generate electricity. A similar principle is used with buoys, where the vertical movement triggered by wave swell is used to generate electricity. The buoys can operate independently and drive a generator under water. Another concept involves placing several buoys very close to each other in a row so that they follow the wave swell on the water's surface like a centipede. In systems similar to those using horizontally oscillating hydrofoils when using tidal energy, vertically oscillating shutters are also used in wave power technology. These move with the wave swell by means of joints. A turbine is driven by the water as it flows back.

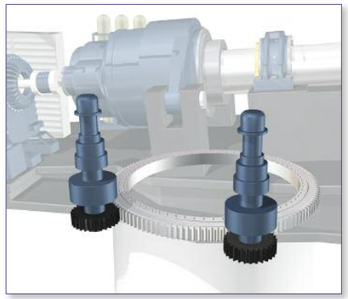
Oscillating water columns have a chamber with one opening above and one opening below the surface of the water. The waves move the resulting column up and down in the chamber. The varying air pressure between the chamber and the ambient air is used to drive an air turbine.

Schaeffler is involved in numerous projects of this type as a development partner. In addition to the expertise of its sales engineers and the Schaeffler Technology Center close to the customer's location, Schaeffler is in particular able to use the comprehensive application expertise in central sector management and the consolidated know-how of central development areas. ■

▲ For ocean current power plants, Schaeffler develops bearing supports that can be directly installed in water. The water is the medium that provides the lubrication. There is no need to use heavy seals that cause considerable friction and oil and grease are not required as a lubricant.

NEW SLEWING RINGS OFFER OUTSTANDING STRENGTH

BY WORKING CLOSELY WITH THE STEEL INDUSTRY, SCHAEFFLER HAS CO-DEVELOPED A NEW, HIGH STRENGTH QUENCHED AND TEMPERED STEEL SPECIFICALLY FOR WIND TURBINE SLEWING RINGS THAT ARE SUBJECTED TO EXTREME LOADS DURING BLADE AND TOWER ADJUSTMENT.



This new material allows full tempering and quenching of the steel and, as a result, provides outstanding strength properties, even with large ring cross sections.

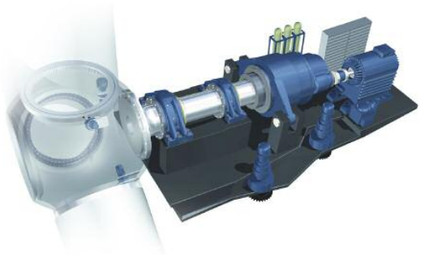
Zinc thermal spray surfaces, multi-layer painting and finished seal surfaces also provide the highest levels of reliability, bearing rating life and security against premature damage, such as fatigue of the raceways and surface corrosion. Due to the material properties and the applied surface protection, the bearings are suitable for use in ambient temperatures down to -40 deg C.

Wind turbines must be correctly aligned to the wind conditions. The tower and rotor blades are adjusted in order that they make optimum use of wind conditions and are not subjected to excessive loads that could cause damage.

For wind tracking applications, Schaeffler currently develops and manufactures slewing rings with outside diameters up to 4,100mm. Due to their design, these slewing rings can transmit radial and axial forces, as well as tilting moments. The bearings are designed as single row or double row, four-point contact bearings without gear teeth or with internal and/or external gear teeth. Their reliable function is a significant prerequisite for cost-effective operation of wind turbines.

Schaeffler Wind Power Standard (WPOS)

Schaeffler has introduced a new Wind Power Standard (WPOS) for its bearings for wind power applications, which fulfils the increasing demands in terms of reliability placed on wind turbines and components in the wind power sector. This new standard for products and processes means that Schaeffler ensures outstanding quality and reliability. By the beginning of 2014, all bearings for wind power applications will be included in this new wind power standard and will also be labelled with the WPOS mark. ■



PRODUCTS

X-LIFE P

X-LIFE LARGE CYLINDRICAL ROLLER BEARINGS OFFER NEW DESIGN OPPORTUNITIES

SCHAEFFLER HAS EXTENDED ITS PREMIUM QUALITY X-LIFE RANGE OF CYLINDRICAL ROLLER BEARINGS TO INCLUDE LARGER SIZE BEARINGS WITH OUTSIDE DIAMETERS UP TO 1,600MM.

Previously, X-life cylindrical roller bearings were available with outside diameters up to 320mm. The new extended range includes both full complement cylindrical roller bearings and cylindrical roller bearings with cages.

Higher Loads

In a bearing application that predominantly involves high radial loads, a cylindrical roller bearing is often the best choice. In this type of bearing, two rollers are guided between rigid ribs on two raceways. The raceways and ribs are part of the bearing rings, which are separated by the cylindrical rollers. The cylindrical rolling elements support the forces not at contact points, as in a ball bearing, but along contact lines and can therefore support higher loads. The general principle is that the larger the number of load-carrying rollers, the higher the basic load ratings. If very high loads are to be supported and speeds are relatively moderate, full complement cylindrical roller bearings are recommended. Where other variables and conditions such as high speed play a role, a cylindrical roller bearing with a cage must be specified.

X-life provides totally new design opportunities for applications that require large-size cylindrical roller bearings.

Longer life

By using its in-house design calculation software and improved manufacturing technologies, Schaeffler has been able to optimise the contact geometry between the roller end faces and the bearing ribs, resulting in a more uniform surface over the contact area between the rolling elements and raceway. This improved internal design results in more uniform internal load distribution.

This, combined with new heat treatment processes for the bearings, means that X-life cylindrical roller bearings now offer up to 20% higher basic dynamic load ratings and a longer nominal operating life compared to standard bearings. These improvements enable customers to optimise design envelopes by either downsizing the bearings or by using the same size bearings with improved performance.

The frictional torque in the bearing is also reduced, which results in lower bearing temperatures during operation. This means the bearings offer significantly longer operating life under the same operating conditions. Alternatively, higher loads can now be applied while maintaining the same rating life values. ■

▲ FAG cylindrical roller bearing
X-life bearings have a significantly longer operating life under the same operating conditions. Alternatively, higher loads can now be applied while maintaining the same rating life values.

SEALED X-LIFE SPHERICAL ROLLER BEARINGS MEAN GREATER EFFICIENCY AND COST-EFFECTIVENESS

▲ Schaeffler's sealed FAG E1 X-life spherical roller bearings reduce grease consumption by up to 80 percent compared to open bearing designs.

SCHAEFFLER'S NEW SEALED FAG E1 X-LIFE SPHERICAL ROLLER BEARINGS MAKE IT POSSIBLE TO REDUCE GREASE CONSUMPTION BY UP TO 80 PERCENT.

An innovative seal concept allows the egress (and therefore loss) of grease to be minimised and eliminates the need for complicated relubrication systems while maintaining the same high dynamic and static load ratings. The compact bearing, which has the same outside dimensions as the non-sealed standard bearings, is therefore almost maintenance-free and is also protected against contamination.
The omission of external seals, which can be replaced by the sealed FAG spherical roller bearings in the future, also saves valuable installation space. The new FAG E1 X-life spherical roller bearings additionally benefit from the proven properties of X-life premium quality, which provide higher dynamic load ratings and a longer operating life due to improved kinematics, optimised surfaces, and high-performance materials.

Improved energy efficiency

The floating central rib used for guiding the wear-resistant cages and rolling elements allows an optimum frictional torque and increases the performance of the new sealed bearings while making them even more energy-efficient.

The sealed FAG E1 X-life spherical roller bearings are characterised by the special contour of the sealing shields. A rib is integrated to prevent the bearing pivoting beyond a tolerance of 0.5 degrees, which would cause the sealing function to be lost. Despite the tight fit in both axial and radial directions, replacement of the sealing shield and the associated reconditioning of the bearing are ensured. Excess grease inserted into the bearing during relubrication can escape via the elastic sealing lip. After the pressure has been compensated to match the environment, the sealing shield is once again in contact with the entire circumference of the inner ring so that contamination cannot enter the bearing.

Cost-effective

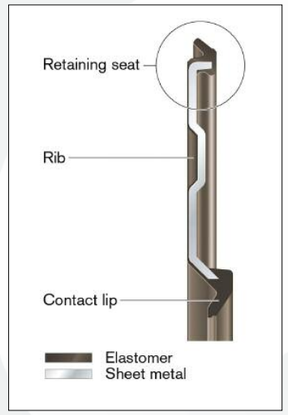
The standard version of the 240/241 series of sealed E1 X-life spherical roller bearings features a particularly high-performance elastomer that is suitable for use up to a temperature of 200 degrees Celsius. This, together with a high-temperature lubricant, allows reliable sealing even at high temperatures and thus extends the service life of the bearing. This increased cost-effectiveness is boosted by the significantly reduced costs for grease consumption and disposal, meaning that the costs of FAG E1 X-life spherical plain bearings are amortised quickly.

Low-noise design for elevators

The new FAG spherical roller bearings are also available in an optional low-noise design, which is ideal for use in elevator systems. This version of the spherical roller bearing is extraordinarily quiet thanks to its special grease and the improved rolling element and raceway surfaces. The bearing's high load ratings and minimal frictional torque also mean that it can meet the increasing demands placed on elevators in terms of their speed and height of travel.

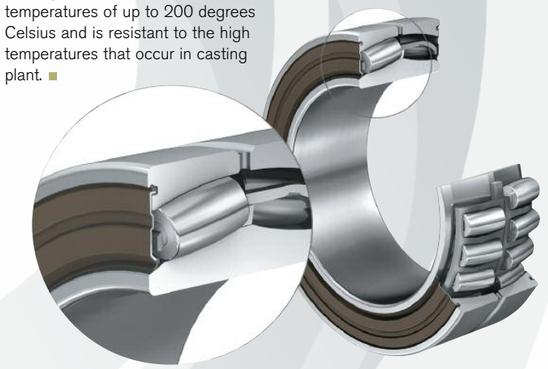
Due to their high level of robustness, the sealed FAG spherical roller bearings are frequently used in the casting plants of steelworks. These bearings have to display a high static load carrying capacity and maximum insensitivity to the ingress of foreign particles at low speeds. The reliable seal makes the sealed E1 X-life spherical roller bearing insensitive to water spray and soot particles.

▲ Ideal for use in harsh environments like the continuous casting plants of steelworks. The seal allows the bearing to be used in extreme conditions while remaining almost maintenance-free.



▲ An innovative seal concept allows the egress (and therefore loss) of grease to be minimised and eliminates the need for complicated relubrication systems while maintaining the same high dynamic and static load ratings.

The elastomer used in the standard bearing is suitable for use in temperatures of up to 200 degrees Celsius and is resistant to the high temperatures that occur in casting plant. ■



PRODUCTS

NEW PRODUCTS

EQUILIGN ENABLES FAST, EASY ALIGNMENT OF ROTATING PLANT

A NEW HANDHELD LASER OPTICAL ALIGNMENT DEVICE HAS BEEN LAUNCHED THAT ENABLES FASTER, EASIER ALIGNMENT OF SHAFTS IN ROTATING EQUIPMENT SUCH AS FANS, MOTORS, PUMPS, GEARBOXES, VENTILATORS AND COMPRESSORS.

FAG Top-Laser EQUILIGN is a compact, robust, easy-to-use device that guides the user step-by-step through the measurement process until correct shaft alignment is achieved. Graphical operating instructions and an intuitive autoflow function ensure that all maintenance technicians can use the device, regardless of their skills or experience.

The correct alignment of coupled and uncoupled shafts is critical in order to achieve high efficiency and reliability of rotating equipment. Approximately 20% of rotating equipment is incorrectly aligned.

A correctly aligned shaft means less friction and vibration are generated by the drive system, which means less wear on belts, pulleys, bearings and seals. This means the running time and reliability of rotating machinery is increased, energy costs are kept to a minimum and overall plant efficiency is improved.

FAG Top-Laser EQUILIGN is waterproof and contamination-resistant (protected to IP65), which means plant and maintenance engineers can use the device in harsh industrial environments. The device is powered by batteries or rechargeable batteries and so is ready-to-use at all times.

Even in poor light conditions, an integral light meter automatically adapts the brightness of the display to suit the environment.

The device is compact and easy to carry, weighing just 800g.

An ergonomic design also allows the user to operate the device using both thumbs.

FAG Top-Laser EQUILIGN benefits from a reliable real time display that indicates any horizontal or vertical movements during alignment. Up to 50 measurement files can be stored directly on the device. Even if operation is interrupted, the measurement data is automatically secured and the process can be continued later without any problems.

Measurement data can be outputted in metric or imperial units. Users can also select from 20 available languages, including Russian and Chinese. The device is supplied with a practical carry case and a range of accessories including mounting brackets, reflector, chains, posts and batteries.

In addition, a set of 360 shims (20 shims in each of three sizes and six thicknesses) and a withdrawal tool is available for eliminating vertical misalignment and 'soft foot'. An Accessory Kit is also available for larger shaft diameters or coupling heights. ■

SCHAEFFLER REPLACES MAIN TRUNNION BEARINGS ON PLANT VESSELS AT TATA STEEL

SCHAEFFLER UK WAS PART OF THE TEAM THAT SUCCESSFULLY COMPLETED THE REPLACEMENT OF THE MAIN TRUNNION BEARINGS ON A BOS (BASIC OXYGEN STEELMAKING) PLANT AT TATA STEEL PORT TALBOT.

MAINTENANCE

By replacing the drive-side trunnion bearings with split rolling bearings, Schaeffler also helped to save the customer five extra days of work. If solid bearings had been used, the customer would have had to disassemble the bull gear unit (i.e. the main drive unit for the vessel).

TATA Steel Port Talbot has two BOS steel making vessels (V1 and V2) in operation. The original vessel was installed in the late 1960s and upgraded in 1991-92, including trunnion bearing replacements. Each vessel has a steel making capacity of 330 tonnes. Loss of operation of a vessel would result in significant lost revenue.

Simon Life, BOS Plant Departmental Engineer at Tata Steel Port Talbot comments: "The bearing replacement work was very successful. The bearings were fitted to a high standard with expertise provided by the Schaeffler team throughout the process. During the bearing changeover, we encountered several problems with components being damaged and jacking issues. However, all problems were discussed with Tata, Schaeffler engineers and Central Engineering support, and between all parties, solutions were generated, action lists compiled and remedies implemented. Without Schaeffler's expertise, the bearing change would not have run so smoothly."

When Schaeffler UK received a telephone call from an area works engineer at the BOS Plant, advising of a sudden bearing failure on the non-drive side (NDS) of the V2 BOS plant vessel, two engineers from Schaeffler Germany were requested to be on site soon afterwards. A meeting subsequently took place to discuss and agree a plan of action.

As Dave Wall, Senior Applications Engineer at Schaeffler UK recalls: "A method statement document was drawn up by Schaeffler UK, which specified the sequence and method to replace the bearings and outline the TATA requirements. Included in this document was a detailed tooling list and a step-by-step procedure for the dismounting and mounting of the drive side (DS) and non-drive side (NDS) bearings."

"The standard 'solid' bearing on the DS was replaced by a special FAG split spherical roller bearing [SSRB], which is the recommended replacement spare, as this reduces the amount of downtime when installing the replacement bearing. The NDS bearing was to be replaced with a similar solid bearing. In addition, various surrounding components also required replacing, once the secondary damage caused by the bearing failure had been identified," confirmed Wall.

Removal of the Drive Side bearing

The cutting away of the existing bearing took a total of 36 hours. The distance between the trunnion spacers (bearing seating width) was measured in order to determine the thickness required for two special, TATA designed, split 'dovetail' spacers. These were required to ensure that the new split bearing would be correctly secured in place. The new split SRB inner ring halves with clamping rings, outer ring half and bottom roller cage halves, were fitted without any problems.

Removal of the Non-Drive Side bearing

The original bearing on the NDS had failed during operation, which had caused the BOS converter to drop down. It was now resting on the bearing housing and the housing covers. After lifting, parts of the damaged bearings were removed. All the components were sent for forensic examination to TATA Central Engineering Metallurgy & Inspection Dept.

The housing back cover, bearing pressure plate and sleeve spacer were found to be seriously damaged. New ones had to be urgently manufactured by Tata Steel's Central Engineering Shops (CES).

The bearing inner ring had disintegrated and the sleeve had to be cut off due to its deformed shape. After removing the damaged bearing, it was also discovered that the trunnion back spacer was in need of repair. Again, machining work was urgently carried out by CES.

Due to the subsequent damage to the bearing housing, Schaeffler expertise was required to manually repair this surface.

Mounting of the new Non-Drive Side bearing

The new bearing was first pre-mounted to determine the correct sleeve spacer width. The bottom half of the housing was then moved back into position and the crossbeam construction removed. Mounting of the new bearing was challenging, as the collapse of the original bearing had caused the vessel to move out of alignment.

Final mounting steps for the NDS and DS bearings

For the DS bearing, the remaining roller cage and outer ring halves were installed. For both bearings, the housing caps were fitted and each bearing was 100 percent filled with grease, including the surrounding free space. The housing covers were bolted in position and new seals with their tensioning devices were fitted. After having successfully completed the work in under 2 weeks, Schaeffler engineers were pleased to be leaving behind a very happy customer.

After the bearings were installed, the work didn't finish there. Schaeffler UK prepared a recommended practical maintenance schedule list.

"Since replacing the trunnion bearings, engineers from Schaeffler UK have also supervised two further BOS vessel bearing changes in a very short timeframe of just two months. Schaeffler has now been selected as the preferred supplier of main trunnion bearings for the two BOS plant vessels at Tata Steel Port Talbot," confirms Dave Wall. ■

APPLICATIONS

FULLY INTEGRATED LINEAR ACTUATOR AND ROLLING BEARING UNITS DESIGNED FOR SOLAR TRACKING SYSTEMS

PHOTOVOLTAIC (PV), CONCENTRATING PHOTOVOLTAIC (CPV) AND CONCENTRATING SOLAR POWER (CSP) SYSTEMS OPERATE MORE EFFICIENTLY WHEN THEIR MIRRORS, COLLECTORS AND PV MODULES ACCURATELY TRACK THE COURSE OF THE SUN DURING THE DAY.

The more precise and trouble-free these systems are, the more efficiently and profitably the solar power plants operate.

By offering its linear actuator and bearings for swivel drives as a complete system, Schaeffler has taken another step towards the full integration of precision solar tracking systems for azimuth and elevation axes.

The linear actuator responsible for stroke movements in the elevation axis was custom designed to withstand the harsh operating conditions typically found in solar power plants. The linear actuator is designed for dynamic loads of up to 5kN and static loads of up to 15kN. The actuator can reach a stroke travel of up to 1,000mm at a stroke speed of 5 mm/s.

The complete mechatronics system comprises the rolling bearings for the individual bearing positions, screw drive spindle and spindle nut, extension tube, compact housing with cover, seal, drive technology (motor and gearbox unit), the sensors, and rod end for connecting the actuator. The innovative design and high flexibility of the unit allow the stroke length and mounting to be matched precisely to individual customer requirements.

Maintenance free operation

The linear actuator can operate in high temperatures and is protected from dust, sand, wind and rain. Due to an encapsulated housing, a reduced number of fully-sealed joints, as well as an integrated motor, gearbox unit and entire drive technology, the linear actuator is able to operate maintenance-free. The sealing components provide the actuator with an IP66 protection rating, which prevents the ingress of contaminants such as water and sand. With its low-maintenance requirements and bearing supports, the linear actuator provides an operating life of up to 25 years.

The high precision axes ensure that the solar power plants generate optimum power output on a continuous basis. Schaeffler's linear actuator concept can also be adapted for use in other sectors or applications depending on the technical and geometrical requirements.

Bearings for precision swivel motion

Schaeffler's AXS angular contact rolling bearings and FAG X-life tapered roller bearings support the swivel drives that adjust the azimuth axis. These bearings have a high load carrying capacity and can be set clearance-free. This is an important prerequisite for high rigidity and positioning accuracy and therefore the efficiency of the entire tracking system.

The AXS series of rolling bearings have cylindrical rollers and raceways that are arranged at an angle to the bearing axis. The roller and cage assemblies comprise cylindrical rollers that are snapped into high-rigidity plastic cages with very close spacing.

This means that high load ratings are achieved. A special feature of the AXS series are the conical bearing rings. These are manufactured using forming methods, making them cost-effective. In addition, turned bearing seats are sufficient for supporting the bearing rings. This reduces the cost of adjacent components. ■

INNOVATIVE BEARING SUPPORTS AND READY-TO-FIT COMPLETE SOLUTIONS FOR MEDICAL TECHNOLOGY

ROLLING BEARINGS, LINEAR GUIDANCE SYSTEMS AND DRIVES HAVE TO FULFIL HIGH REQUIREMENTS IN TERMS OF PRECISION, RUNNING SMOOTHNESS, AND SAFETY - WHETHER THEY ARE USED IN C-ARMS, PATIENT COUCHES, OPERATING ROOM TABLES OR CEILING MOUNTS.

Schaeffler offers expertise and a range of products for all moving components and systems in medical technology that is unrivalled worldwide.

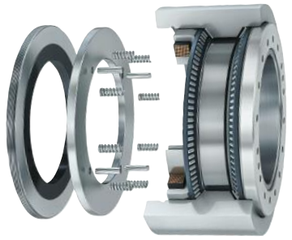
Electromechanical lifting column: A ready-to-fit complete solution for C-arms that fulfils the highest requirements

The lifting column features a robust, compact design and can move loads of up to several hundred kilograms safely, precisely, and reliably. The compact mechatronic system is designed for the requirements of C-arms used in medical technology, but it can easily be adapted to meet the demands of other applications. The lifting columns are delivered as ready-to-fit units that can be easily integrated into both new and existing systems.

The lifting column comprises a solid support tube with a cable feed, an inner tube, a motor with reduction gearing, a spindle with a safety retention nut, flexible cable trunking systems to accommodate the cables, a cable set, and flange for mounting a swivel unit. Two high-performance linear guidance systems arranged opposite each other in the lifting column ensure precise operation.

Linear applications for patient couches and operating room tables

Patient couches, operating room tables, and dentists' chairs require the highest possible level of mobility combined with a high degree of robustness.



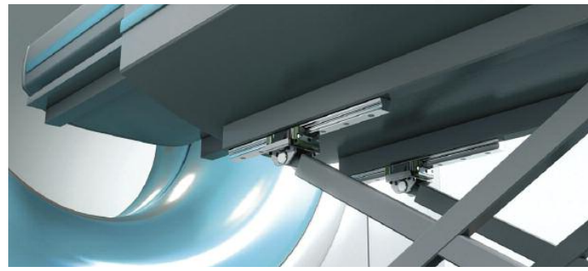
▲ The AXS axial angular contact roller bearing is also available with an integrated electromechanical brake.

INA linear guidance systems are the perfect solution here. The KUVE-B and KUSE linear recirculating ball bearing and guideway assemblies in particular fulfill even the highest requirements. These systems feature four and six rows of rolling elements respectively, which provide an extremely high load capacity. The linear recirculating ball bearing and guideway assemblies are designed for high loads on each carriage.

▲ Operating theatre ceiling mount

In addition to height adjustment, the ability to adjust operating room tables laterally and longitudinally is also important. e.g. when tests need to be carried out during an operation. If, for example, a C-arm is used for taking X-rays, the operating room table can be placed in an offset position, thus creating space underneath the patient. The KUVE-B linear system is ideal for both lateral and longitudinal adjustments: Four rows of balls make not only high weight and moment loads possible, they also ensure an even, low-friction displacement resistance. The components and individual parts are perfectly matched to one another and thus also provide a smooth-running, low-noise movement. The integrated grease reservoir ensures that the rolling elements in the linear system are permanently lubricated and therefore almost maintenance-free throughout their entire service life.

The linear guidance systems are also available with an additional Corrotect® or Protect® coatings that provide optimum protection against corrosion.



Bearings for ceiling mounts – smooth-running with high load capacity and low noise levels

Modern operating rooms are characterised by flexibility in terms of personnel assignment and the equipment used. Safety and cleanliness requirements have made laying cables on the floor a thing of the past.
The number of devices used during an operation also continues to rise.
But where can all the medical equipment and cables go? The solution is to use ceiling mounts with swivel arms that can carry the equipment and make flexible, individual positioning possible. These ceiling mounts have to support high loads, be easy to move, and provide sufficient space for supply lines.
The AXS axial angular contact roller bearing is particularly suitable for use in ceiling mounts. This bearing is mounted in pairs, supports high loads and tilting moments, and allows smooth-running, low-noise movement. The small bearing cross-section - i.e. the low section height and large inside diameter - enlarges the cross-sectional opening of the ceiling mount's support arm joint and thus makes it easier to install the numerous supply lines.

The AXS axial angular contact roller bearing is also available with an integrated electromechanical brake. This brake employs springs that press the anchor plate against the brake lining, and thus prevents the bearing unit from turning when no current is flowing. When current is applied the brake pad is released, allowing the unit to be easily repositioned. ■

▲ The KUVE-B four-row linear recirculating ball bearing and guideway assembly ensures the highest possible availability and comfort in patient couches.

▲ Compact mechatronic lifting column with C-arm.

▲ The electromechanical lifting column allows high and precisely reproducible guidance quality.

RETIREMENT

ROY MCDONALD 40 YEARS LOYAL SERVICE

FRIENDS AND COLLEAGUES SAID A FOND FAREWELL TO ROY MCDONALD WHO RETIRED AS SENIOR WAREHOUSE PERSON AFTER SERVING FOR OVER 40 YEARS WITH THE COMPANY.

"Striving for perfection, superb organisation, and always wanting to do the right thing" was how Richard Hall, President Industrial, summed up Roy's qualities, adding that, "he should be very proud of his loyalty and dedication to the Company over the last 40 years".

Richard Hall presents Roy with his leaving gift on behalf of the Company.

Roy started working at INA Bearing Company Ltd as a Warehouse Man on 20th February 1972. Two years later he was appointed Warehouse Supervisor, and after another three years, he became Warehouse Manager.

Prior to working at INA, Roy had held only two other jobs – one as a Book Man (or Foreman) in a Timber Yard in Belfast and the other in the Warehouse at Schweppes in Minworth on £11 a week, before moving across the road to INA Bearing Company.

In October the same year, he married Susan. He has two children, Robert and Meg, 5 grand children and one great grand child. Asked if he has any plans for his well earned retirement, Roy confirmed that he wants to take things easy for a while.

He is looking forward to spending time with his family, taking his grand children to school and his great grandchild to nursery.

"It has been a pleasure working with you all", says Roy on his last working day. "I can still remember when we achieved our first £1 million turnover - and there aren't many of us who can say that anymore! I will miss a lot of the people here at Schaeffler and I have enjoyed the fun and the banter over the years". We wish Roy and his family a very happy retirement.

Richard Hall and Roy McDonald with colleagues in the warehouse at Minworth.

NEW ARRIVAL...
WELCOME TO BABY ELLA GRACE

Welcome to baby Ella Grace Gibbins born on 4th January 2013 to proud parents Emma Deegan and her partner Steve. ■

Terry Melloy with Kate Hartigan

TERRY MELLOY RETIRES AFTER 41 YEARS SERVICE

WE ALSO SAY A FOND FAREWELL TO TERRY MELLOY WHO JOINED THE COMPANY IN 1972 AS A WAREHOUSE OPERATIVE.

He had heard from a neighbour that there was a vacancy at INA, based at the time in Maybrook Road, and applied for a role in the warehouse following an earlier redundancy. According to Terry, the position was advertised as "temporary"!

Summing up his time with the company, Terry says, "I've enjoyed every minute!". He remembers moving from the original premises in Maybrook Road, Minworth to the Forge Lane site. "It was all so new and much better working conditions", Terry recalls. "We had new machines – narrow aisle trucks and forklifts – and much more room in which to work. However, the job was very much a manual one; writing all cards and labels by hand and fixing them to pallets". The next significant change came when computers were first introduced into the warehouse. "It was all very different, but with a lot of support and help in the first few days, we all got used to them and can't imagine being without them now" he says.

Asked what he will miss the most about working for Schaeffler, without hesitation Terry says he will miss all the people, having made a lot of friends over the years.

Giving her farewell presentation on Terry's birthday, Kate Hartigan, Managing Director said the company would be losing a much loved, happy and cheerful person who always went out of his way to help anyone, and he was wished a long, happy and healthy retirement.

Terry, a devoted father of three and grandfather to Harry, 10, Georgina, 8 and Oliver, 3 confirmed that his wife Betty has a number of DIY jobs waiting for him although he was unsure exactly where to start. At least he can take his time deciding what he takes on first. ■

RETIREMENT

HAPPY RETIREMENT – CAROLE FORSHAW

ALL HER FRIENDS AND COLLEAGUES WISHED CAROLE FORSHAW ALL THE BEST WHEN SHE RETIRED FROM THE COMPANY AFTER 36 YEARS OF SERVICE.

Carole has undertaken a variety of roles during her time with INA and then Schaeffler, starting as a secretary to sales management before joining the Customer Services Department working on both the OEM and Distribution teams.

Carole spent the last few years working in the Materials Department.

Kate Hartigan presents Carole with her leaving gift on behalf of the Company.

GOWER CHARITY BIKE RIDE

The Gower bike ride took place on Sunday 23rd June and a number of the riders cycled either the 28 or 46 mile course. This was a challenging cycle as it was a very windy day!

However it also gave stunning views over the Gower Peninsula. All enjoyed the day and raised money for the British Heart Foundation. ■

From left to right are; Mark Thomas, Phil Stanbury, John Bailey, David Beckett, Peter Jones, Mark Williams, Peter Howell, Andrew Sheppard, Richard Delve, Vicky Derrick. Cyclists not in the picture: Dennis Horsley, Jonathan Rees, Mark Roberts.

SCHAEFFLER

Together we move the World...

Innovative technology partner for automotive, industrial and precision engineering applications

Increased energy efficiency, lower costs, strict low carbon objectives and improved operational safety are just some of the challenges presented to us by our customers. As a development partner, Schaeffler delivers the reliability, the quality and the innovation you need to move your world.

Our award-winning engineers excel at creative engineering that often involves an unconventional approach. We question established conventions, find unusual paths and dare to apply different perspectives to enable us to realise new and remarkable ideas.

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