



THE FUCHS GROUP MAGAZINE

In Motion



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» The world is changing at a rapid pace; networked society is increasing the pace. More than ever, we are acting as an agile company

that sees this change as an opportunity. Global markets and technologies are changing at extreme speed. We create value for our customers, partners and shareholders with our globally defined brand and the promise 'technology that pays back'. For us, it is clear that you can only be a global leader by being dynamic. We are always in motion. «

STEFAN FUCHS | CHAIRMAN OF THE EXECUTIVE BOARD

OUR BUSINESS MODEL – FOR OVER 85 YEARS

LUBRICANTS.TECHNOLOGY.PEOPLE. Our company rests on these three pillars. As a mission statement, they are the basis for our daily activity around the world and simultaneously the core of the FUCHS brand.



LUBRICANTS. 100 % FOCUS

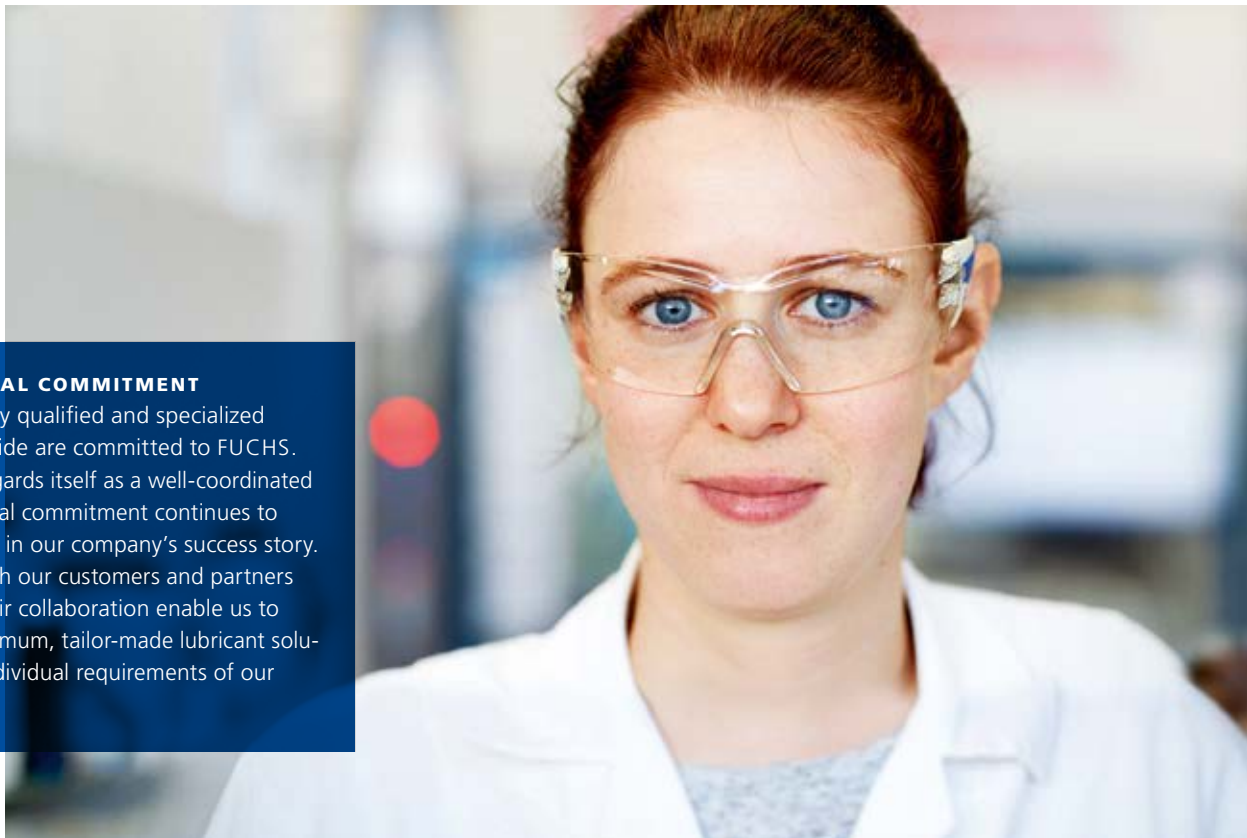
Worldwide, FUCHS focuses 100% on the development, manufacture, distribution, and sale of high-quality lubricants and related specialties for nearly all applications and industries. With over 10,000 products, we offer our customers a full portfolio of lubricants that comply with exacting national and international standards.

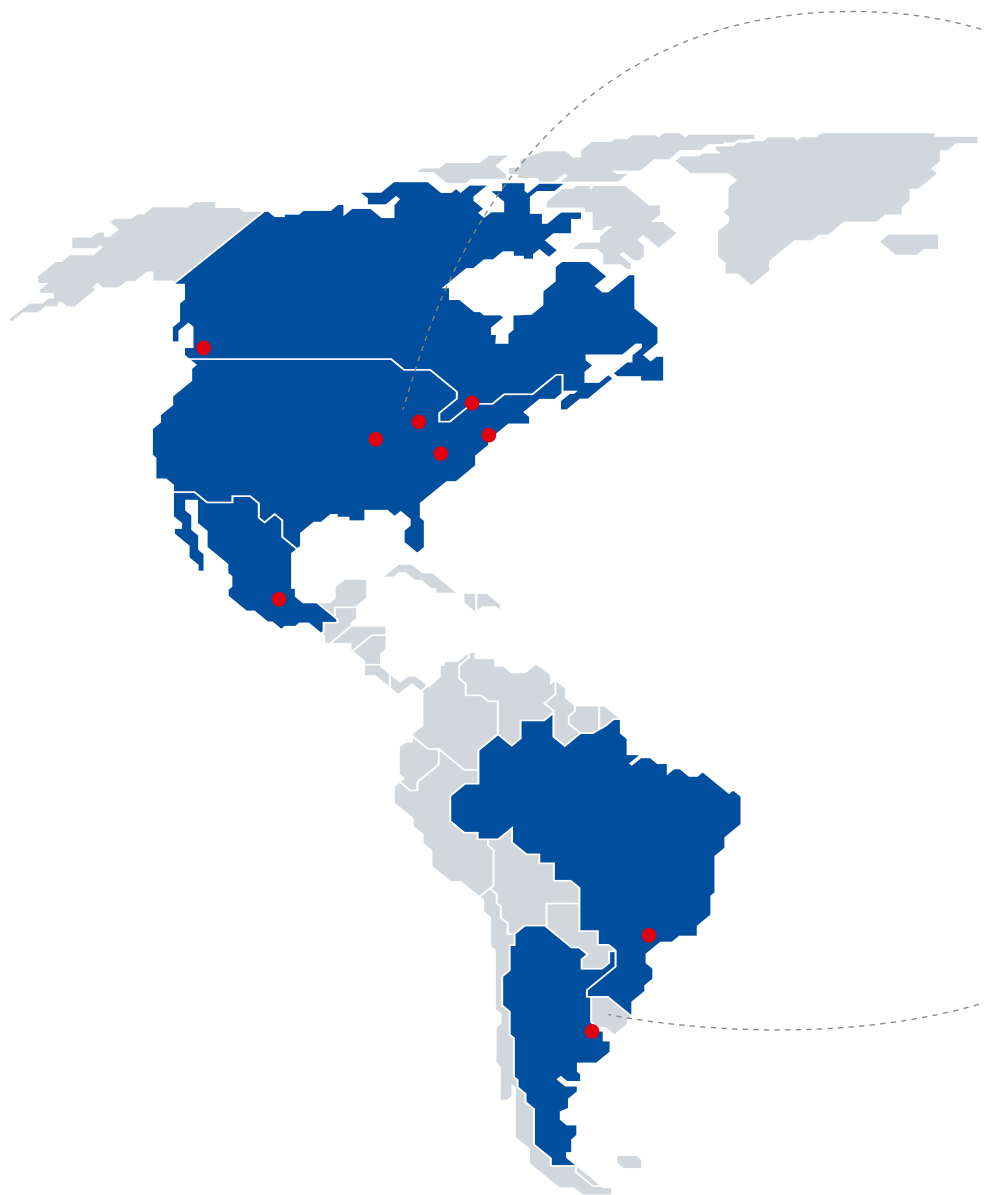
**TECHNOLOGY. HOLISTIC SOLUTIONS**

Technologically advanced, process-oriented, and holistic lubricant solutions are a key success factor for FUCHS. Our worldwide network of experts meets customer requirements on a global scale by quickly and efficiently networking fields of special expertise. We strive to be the technology and innovation leader in important business areas. Our approach focuses on effectiveness and efficiency, safety and reliability, and the sustainability of lubricants along the process and value chain with regard to supplier, raw materials, production, and the end product.

PEOPLE. PERSONAL COMMITMENT

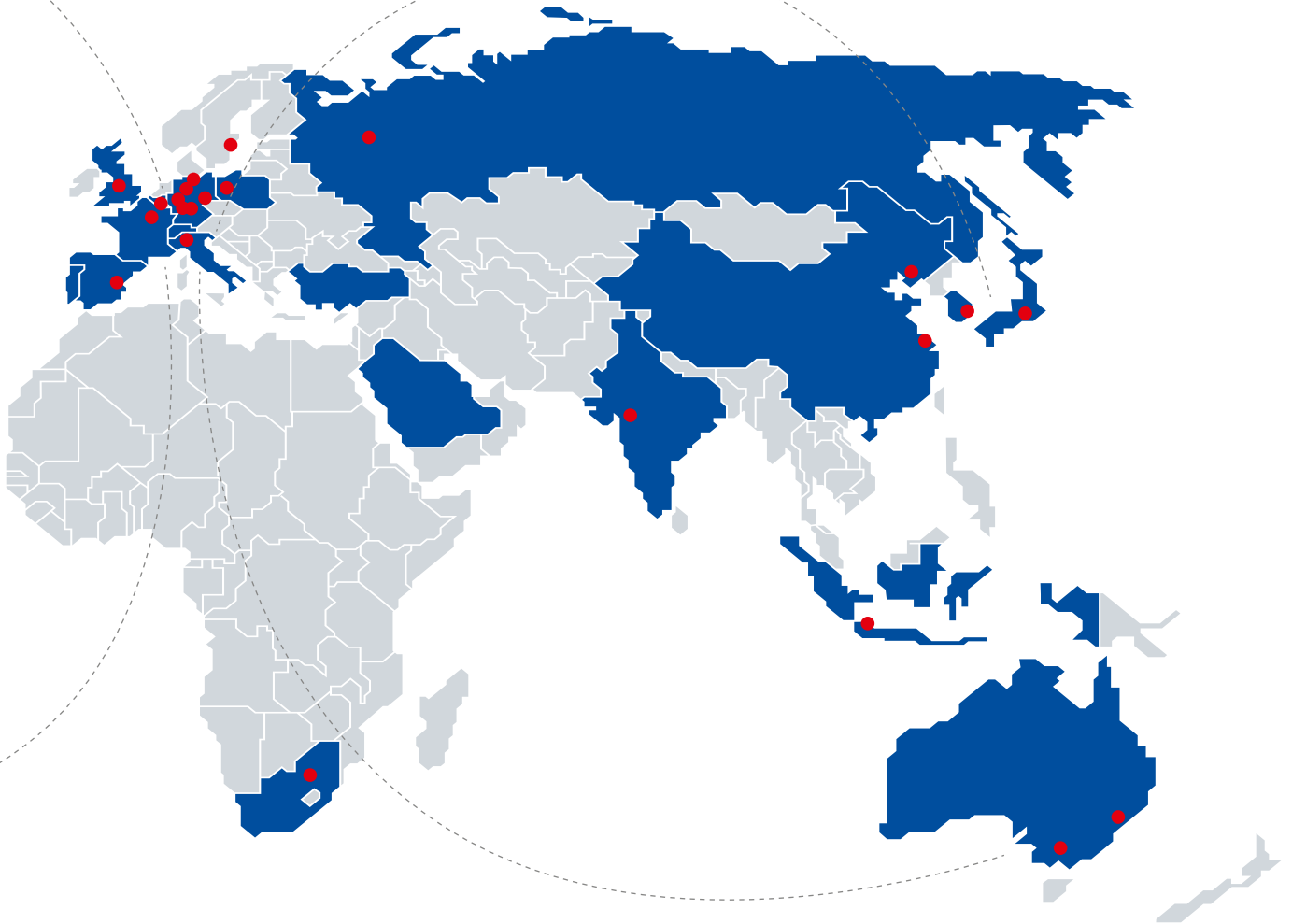
Almost 5,000 highly qualified and specialized employees worldwide are committed to FUCHS. Our global team regards itself as a well-coordinated unit, whose personal commitment continues to write new chapters in our company's success story. Intensive dialog with our customers and partners and trusting and fair collaboration enable us to always find the optimum, tailor-made lubricant solution to meet the individual requirements of our customers.





FUCHS WORLDWIDE

We are where our more than 100,000 customers need us – in over 45 countries around the globe. This local presence and our employees with their extraordinary know-how form the basis of our success. In 57 operating companies and 34 plants, they communicate every day in order to network their expert knowledge.



57

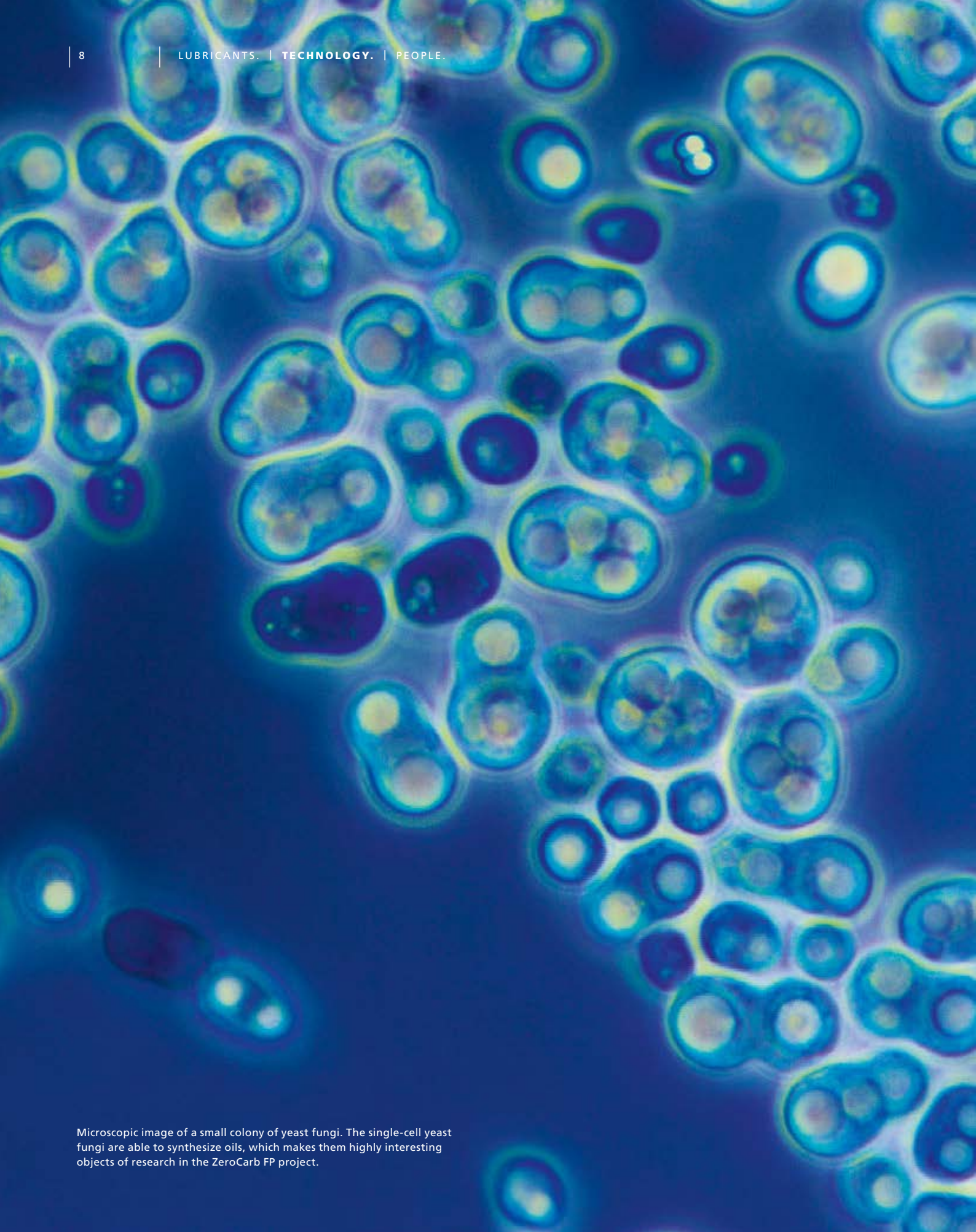
operating companies
worldwide

- 5 Germany
- 26 Other European countries
- 18 Asia-Pacific
- 2 Africa
- 4 North America
- 2 South America

34

production locations
worldwide

- 8 Germany
- 8 Other European countries
- 8 Asia-Pacific
- 1 Africa
- 7 North America
- 2 South America



Microscopic image of a small colony of yeast fungi. The single-cell yeast fungi are able to synthesize oils, which makes them highly interesting objects of research in the ZeroCarb FP project.

WASTE TO VALUE

Renewable raw materials are all the rage right now, but the ZeroCarb FP research alliance is going one step further. They want to make certain kinds of waste the basis of high-value products. FUCHS is working with project partners to, among other things, obtain key components of different lubricants from old frying fat using an innovative, resource-conserving process.

By Ulrich Pontes

The word "ZeroCarb" is printed on the white pot, which, judging by its shape, looks like it could contain face cream. The laboratory technician uses a spatula to scoop up a small amount of grease and spread it on a small metal plate. This is part of a piece of equipment on the laboratory bench, which from a distance resembles a food processor – but with a connected control PC. The laboratory technician presses a button to start the measurement: A second metal plate slides down onto the grease and, almost imperceptibly, starts to rotate.

The head of advanced development at FUCHS SCHMIERSTOFFE GmbH in Mannheim is standing next to her, talking excitedly about everything that this relatively simple-looking piece of equipment can do. The equipment in question is a rheometer, whose name is derived from the Greek word for "flow." "Many lubricants are not merely viscous; they have a small elastic component, too." He places the palm of one hand loosely on the other and turns them against each other. "If you twist a layer of lubricant like this, there is a tiny amount of restoring force." This is what the rheometer measures when it rotates the plates, with

precisely predefined parameters such as plate distance and temperature. “The lowest possible speed is two rotations per year. Per year!” emphasizes the department head.

Ultimately, the head of advanced development continues, rheometer testing like this combines multiple standard test procedures for lubricants in a single, automated measuring process. As such, this process is a key element of what he and his staff want to achieve: The developers want to see whether the lubricant in the rheometer – with the first full prototypes from the ZeroCarb research project (see “The ZeroCarb FP strategic alliance”) – behaves exactly as predicted.

An unusual genesis

This might sound unspectacular, but it is an amazing achievement because the ZeroCarb product represents a major advance in terms of sustainability. Thanks to a new synthesis process, one of its key constituents can be obtained from another, sustainable resource: used cooking oil. “In other words, the stuff that chip shops and restaurants up and down the country produce every day as waste,” says the head of advanced

development. This completes the cycle of materials in an eco-friendly manner. Renewable raw materials mean that we no longer have to choose between “food or fuel”, because now we can have “food then fuel.” But the focus is not just on lubricants: The aim of ZeroCarb is to produce other materials, with even more flexible uses. “For FUCHS, this could ultimately represent another major step away from fossil fuels toward sustainably produced raw materials,” continues the head of advanced development, emphasizing the strategic aspect.

The process of refining old frying fat to create a high-quality raw material involves two steps. The first step, in which the fat molecules are split open, is common practice in biodiesel production. The second step, however, is highly innovative and was completely redesigned from the ground up for the ZeroCarb project. An enzyme – a biochemical catalyst produced from living organisms – plays a key role here. “We exploit the synthesis activity seen in the natural world,” says the head of advanced development.

To find out more about the background to this particular step in the production process, you have to travel a good 30 kilometers northeast from the FUCHS laboratories. In a protected industrial, Bauhaus-style building in the attractive town of Zwingenberg, which lies on the Hessian Bergstrasse, are the headquarters of BRAIN AG, in a converted Fissan powder building. This research-focused biotechnology company is a project partner of FUCHS.

Refrigerators full of bacteria and algae

We are first led into a nondescript underground room containing perhaps a dozen wide refrigerators. “This is the heart of BRAIN AG – our bioarchive,” explains Dr. Wolfgang Aehle. The highly experienced chemist is responsible for corporate development in the field of performance proteins and enzymes. “These refrigerators contain our collection of microorganisms and microalgae – in total, around 53,000 different strains isolated from, for example, ground or water samples.”

These largely un-researched bacteria, yeasts and algae produce countless enzymes to help them biochemically convert molecules from their natural environment for their own metabolic processes. But some of these enzymes are potentially viable for technical applications. In domestic products, for example, they can help to increase the stain removal properties of washing agents; or they can modify organic molecules from certain kinds of waste so that they can potentially be used in the production of lubricants.

The ZeroCarb FP strategic alliance

The name stands for “zero-carbon footprint”, which the research alliance is aiming to achieve through the recycling and biotechnological refinement of carbon-containing waste streams. The subproject teams focus on different areas including wastewater, exhaust gases and byproducts of biodiesel production. Since 2013, this alliance – which, in addition to FUCHS SCHMIERSTOFFE GmbH and BRAIN AG, includes several other companies from a range of different industries – has been sponsored by the Federal Ministry of Education and Research as part of the “Industrial Biotechnology” initiative.

9 years – that’s how long the project is expected to last.

The project is divided into three phases, with phase two already approved and launched at the end of 2016.



Dirk Bogaczyk, employee from the River Emscher water management association (Emschergenossenschaft) in Essen and overall coordinator for the first phase of the ZeroCarbFP strategic alliance (2013–2016)

Mr. Bogaczyk, what is the goal of ZeroCarb FP?

To ensure the practicability of this application, the experts in Zwingenberg first need detailed input, which is to come from the enzyme. This input was provided, in this case, by the FUCHS advanced development team, explains Dr. Birgit Heinze, ZeroCarb project manager at BRAIN. And now this is where the expertise of the biotechnology specialists comes in. “The first step is screening,” says the project manager. This is a process that involves identifying potential enzyme candidates and producers, for example using microorganisms that the researchers know possess the ability to functionalize fatty acids. One door down, in the molecular biology laboratory, the microorganisms are cultivated and then tested for their ability to produce the required molecule.

“This qualitative preselection process is followed by the quantitative examination,” continues Birgit Heinze. This process involves clarifying, for example, exactly how and how effectively the enzyme works. “Parallel to this, we start to develop the actual biocatalytic process.” To simulate the technical process in which the enzyme is to convert the raw material into the final product, the scientists use a SpinChem reactor – a saucepan-sized glass container with a stirrer and perforated chamber attached. This contains the enzyme, which is on a carrier material. “Here we can see, for example, how stable the enzyme is,” says the project manager.

The challenge of upscaling

Using different methods, the researchers can optimize the performance of the enzyme, for example by promoting the evolutionary development of the original microorganism in the hope that the enzyme, too, will evolve and become more effective. “At the same time, we have to develop a second process: the biotechnological production of the enzyme itself,” says Wolfgang Aehle. It is not generally the original organism that is used here, but instead a well-researched production organism such as coliform bacteria. “Into this we transfer the genetic blueprint for the desired enzyme so that the organism can then produce this enzyme.”

The goal is essentially to create a closed, highly effective carbon cycle. To achieve this, carbon compounds from industrial waste and byproduct flows are to be biotechnologically converted – that is, using microorganisms – into new resources. We are experiencing a raw material revolution. Many industries are trying to reduce their dependence on petroleum, switch to sustainably produced raw materials and employ alternative, ecofriendly processes. Politicians are supporting this revolution with the “National Research Strategy BioEconomy 2030”, which was initiated in 2010. And given global economic and population trends, this revolution cannot come soon enough. The demand for food is expected to double by 2050, as is the volume of waste; in addition, the volume of bioplastics is expected to triple.

What, specifically, is the team researching?

The team is working in different areas. For us in the water industry association, we are, of course, interested in the processes involved in extracting carbon and other resources from wastewater. Other subprograms are focused on, for example, glycerin, a residual product of biodiesel production, while others are focusing on carbon dioxide in flue gas. With the help of biotechnological processes, these resources are to be used to produce flexible platform chemicals, bioplastics and additives for lubricants.

What are the biggest challenges?

In the field of biotechnology, upscaling is always tricky. In the research phase, producing quantities in the milliliter or milligram range is generally considered an achievement. We do not yet know whether and how processes can subsequently be upscaled to the liter or even cubic-meter range. Another challenge is to leverage synergies. Previously, the subprograms operated relatively independently, but now we have to foster a collaborative mindset and use processes and systems for a variety of applications and resource streams. This is closely connected with the third major challenge. Ultimately, it’s not enough simply to develop processes that function. They also have to be economically competitive and, ideally, remain competitive even in the face of ever-changing conditions such as fluctuations in the price of oil or demand for certain specific raw materials.



How can we improve these oils so that we are even better equipped to deal with upcoming technological advances? The head of advanced development talks to his team leader. Her tasks include coordinating the ZeroCarb activities at FUCHS.



Preparations for a rheometer analysis to ascertain the properties of the lubricant. The smaller picture shows the second, rotating plate in its start position for the measurement. Then the black cover is lowered, meaning that you can no longer see the measurement plates. The cover ensures that the temperature can be regulated to predefined values.

The BRAIN employee opens the door to another laboratory, where we can see not just small glass reactors, but also vast steel vessels, the biggest of which is several stories high. Aehle explains: "One major challenge is upscaling. When the microorganisms grow as we want them to in a one-liter fermenter, this does not necessarily mean that the process will also function on a larger scale." The researchers at BRAIN want to control enzyme production in a fermenter with a capacity of least 200 liters before approving the process for industrial-scale production.

Close-up of a piece of apparatus for special, long-term stability testing.



Over the course of the three-year project research phase, which has just come to an end, even the production of just one kilo of raw material may be considered a success. "We needed around three grams of enzymes for that," says Birgit Heinze. At FUCHS in Mannheim, however, this one kilo of raw material helped to produce several kilos of lubricant. "In preliminary experiments, we worked with just 10 grams and more of raw material. To produce such tiny quantities of lubricants, the colleagues stood there with a thermometer for one or two hours and did the stirring themselves," explains the advanced development team leader, who is coordinating the ZeroCarb project at FUCHS. "And in the pre-development phase, our state-of-the-art measuring techniques mean that, even with just a few grams, we can conduct highly informative investigations."

Crucial to this is the aforementioned rheometer. In just a few simple steps, it can be modified for tribometric tests – that is, measurements where friction and wear also play a role. "On the basis of these results, state-of-the-art simulation methods allow us to make astonishingly accurate predictions for real-life applications," says the head of advanced development. And this is why he has no doubt that ZeroCarb lubricants will fulfill all functional requirements. Nevertheless, proper application tests are still necessary for demonstrating compliance with all specifications. These become possible in the next scaling step, i. e. with around 50 kilos of raw material.

But there's another soon-to-be-addressed aspect that the lubricant developer finds even more exciting: the minimum requirements. The team leader asks a crucial question: "How pure do the raw materials have to be? This will ultimately determine the price." So in addition to all the technical activities, another challenge facing FUCHS and its partners during the scheduled project runtime up to 2022 will be to address the various economic issues, which have so far not been considered in any great detail. ■



IN MOTION

FUCHS, number one among independent lubricant suppliers, has been growing constantly for years. The Chairman of the Executive Board Stefan Fuchs sees the ability to adapt as an important factor in this success and explains where FUCHS is currently moving and changing.



By Silke Wernet

Mr. Fuchs, how would you assess the financial year 2016?

We are very pleased that we have followed on from 2015, when we exceeded the two-billion mark for the first time, with sales revenues of €2.3 billion in the past financial year. Our growth in sales revenues in 2016 was dominated in particular by the large acquisitions DEUTSCHE PENTOSIN-WERKE GmbH and STATOIL FUEL & RETAIL LUBRICANTS (SFRL), which are both included over the full twelve months for the first time. Our organic growth was mainly in Europe, especially in Germany and Eastern Europe. Also in Asia, especially in China and India, we achieved very good results. We made important changes for the future in America – including the expansion of our product portfolio, two smaller acquisitions and large investments at the Chicago site.

» Over more than 85 years, we have always responded quickly to changing market conditions and used this to our advantage. We were and are always in motion. «

STEFAN FUCHS | CHAIRMAN OF THE EXECUTIVE BOARD

Including 2016, your company has therefore increased its earnings for the eighth time in a row. Why is FUCHS such a success story?

There are many reasons. In addition to our motivated team, a very important one is that we were and are always moving. In our more than 85-year history, we have always responded quickly to changing market conditions and used changes to our advantage: After it was founded, our company was gradually expanded internationally up to the 1970s. It was by no means an easy decision for our family to go public – but we took the chance to do so in 1985. After more than 30 years, we have a clean record: There hasn't been a single year with a loss, and we have always been able to pay dividends. The IPO was followed by some major acquisitions around the world. This resulted in a mix of locations with the genuine FUCHS culture, such as China, where we established ourselves back in the 1980s, and acquisitions that we had to integrate culturally and in terms of infrastructure. This was successfully accomplished over the years.

You have also made groundbreaking decisions in the more recent past.

The world is changing at a rapid pace. This change must be seen as an opportunity. We are therefore undergoing a process of change in which we have already taken crucial steps in order to successfully overcome future challenges. For example,

€300 million,

which FUCHS will invest in its growth initiative by 2018, is the largest investment budget in the company's history. About €100 million has already been spent in 2016.

GERMANY

Developments at the Mannheim and Kaiserslautern sites with warehouse and office expansions. The completion of the new test field building considerably increased research capacity in Mannheim.

SWEDEN

The planned factory will replace the rented plant in a few years.

CHINA

In Wujiang (Jiangsu province), a new 80,000-square-meter factory with eight filling lines, two warehouses and 55 tanks – one of the most modern lubricant production facilities in China – will be built by the end of 2018.

USA

As part of the 3C commitment to offer identical grease for OEM customers on three continents, the production of 29 different specialty greases will start in the new factory in Harvey, Chicago, in February 2017.

SOUTH AFRICA

The new grease plant near Johannesburg will produce a diverse range of greases starting in summer 2017. State-of-the-art technology will allow South African customers' constantly rising demands to be met.

AUSTRALIA

The plant in Beresfield near Newcastle will commence operations in April 2017. The new site guarantees continued proximity and efficient supply to customers in Australia.



in 2012 we came up with the mission statement “LUBRICANTS. TECHNOLOGY. PEOPLE.” complemented by our values of trust, respect, reliability, creating value and integrity. This mission statement also explains our business model: We are focused on the world of lubricants and want to grow worldwide with around 10,000 products. We still have enormous potential here, as well as in the field of technology, where we want to be the clear technological driver. We connect our employees internationally and use regular network meetings to bring them together with other experts in their field from around the world in order to promote the transfer of knowledge. This is one of our major strengths. On the basis of our mission statement, we in the Group Management Committee defined the brand house in 2015 with FUCHS as the single umbrella brand for the whole world. It is founded on the positioning as “my lubricants company” for all stakeholders and the clear promise to our customers that we stand for technology that pays back. Our vision is “being first choice”. Another important element of the change process are the leadership principles, which we are now rolling out worldwide.

What is it?

On the basis of our values, we have established six global leadership principles relating to information sharing and knowledge management, for example. We thus clearly define the leadership style with which our teams should be led worldwide, how we ensure open communication free of hierarchies and how we cooperate successfully across international borders. We know that we need to tread carefully on this issue when it comes to our employees and that individual countries have different conditions. This process will therefore take several years. In general, we have determined that we are stretched to our limits with regard to communication in 60 companies and with more than 1,000 new employees. We will therefore do a lot more in the future to convey to our employees what FUCHS stands for. The global intranet and a planned chat tool are steps in this direction.

In a world that is turning ever faster, the issue of digitalization is also playing an ever greater role. How is FUCHS responding?

Digitalization is affecting us in many areas, be it logistics, production, sales or the monitoring of our products with the customer. We have therefore established a think tank for this issue, a company that deliberately considers new approaches and advances digitalization projects.

What else is involved in the change process you mentioned?

Because we believe the customer is king, we are working on every level to ensure that our customers are satisfied. We are therefore also working on a better balance between the triangle of sales, research and product management. Specifically, our industrial business will be represented by its own Vice President (VP) in the sales area in the future. And in order to bring product management onto an equal footing, we are creating a new VP position here too. While global Product Managers currently report directly to our Chief Technology Officer, the new VP will bundle their interests in the future.

The continuously profitable growth is also an expression of constant change and simultaneously the consistency of FUCHS. By 2018, you will invest €300 million into the growth initiative. What is the motivation for this?

We want to continue consistently expanding our global growth potential. We are deliberately spending money today in order to increase our future income. When choosing our investments, we look to the major growth regions of Germany, the USA and China. But we are also very interested in markets such as Korea, Russia, India, Turkey, Poland, Australia and South Africa. Our market shares here are sometimes markedly different, including between industries, and we are also looking for opportunities to strategically expand our business. We took such an opportunity, relating to the industrial oil business in the USA, in 2016 by acquiring ULTRACHEM INC.

How can FUCHS' success story be continued in the years to come?

The global economic and political situation will remain tense. However, our broad-based business model is good at absorbing uncertainty. For example, the vehicle market accounts for only a quarter of our activities. In addition to our wide range, the family values, which can be seen in the ownership structure, are another stability factor. They guarantee our independence and allow us to set out a long-term and sustainable strategy. Besides our high agility, we also have an absolutely stable foundation. We will therefore remain in a solid position and stick to our chosen path. ■

85 years of FUCHS PETROLUB: Milestones of innovation

1991 – HYDRAULIC OIL WITH NO HEAVY-METAL ADDITIVES

Kinder to the environment, soil and water and enhancing efficiency in production facilities: With its RENOLIN ZAF product range, FUCHS launches the first high-performance, zinc-free hydraulic oil. Instead of wear-protection additives containing heavy metals, phosphorous- and sulfur-based additives are used instead.



2004 – MILESTONES IN MEDICAL TECHNOLOGY

ECOCUT 7520 LE-S and PLANTOCUT 10 SR represent milestones in the development of lubricants for medical technology, making FUCHS the first provider on the market to offer certified and toxicologically nonhazardous machining oils for the manufacture of implants – a benefit that can be seen through the entire process chain.



1975 – PLANTO: BIODEGRADABLE

The PLANTO series demonstrates that eco-friendliness and high performance need not be mutually exclusive. Rapidly biodegradable products containing synthetic esters based on renewable raw materials represent an alternative to conventional lubricants.



2012 – NEW ANTI- CORROSION PREVENTION

Thanks to CPX technology, the world's most state-of-the-art full solid protection system, FUCHS sets new standards in corrosion prevention. This revolutionary wax conservation technology extends the period of protection and optimizes the production process.



2010 – XTL TECHNOLOGY

The new XTL engine oil technology sets new standards in increased efficiency. FUCHS first started developing engine oils for cars, and then for commercial vehicles; in tests, these oils helped to significantly reduce fuel and oil consumption.



2000 – ZINC-FREE ENGINE OIL

With TITAN GT1 0W-20, FUCHS develops a groundbreaking world first: zinc-free engine oil with ultra-low viscosity. This innovative technology becomes the unique selling point of an entire product range aimed at reducing fuel and oil consumption and whose lack of heavy metals helps to protect the environment and catalytic converters.



1999 – SKIN- FRIENDLY PRODUCT

A water-miscible cooling lubricant that is kind to the skin yet still offers maximum corrosion protection: the ECOCOOOL SCIP series brings to the market a new generation of cooling lubricants with an almost neutral pH value. This innovative product from FUCHS improves workplace conditions and also exhibits outstanding cutting and lubrication properties. ECOCOOOL SCIP sets new standards in skin compatibility, extends tool life and exhibits superior surface quality. Up to casting materials, this new cooling lubricant can be used on a wide variety of metal alloys – from difficult-to-cut, high-alloy ferrous materials to specialized aerospace materials. ECOCOOOL SCIP is the basis of the ECOCOOOL ALUSTAR series, which remains highly popular to this day.

FUCHS: HELPING YOU IN DAY-TO-DAY LIFE

FUCHS offers tailored products in six different categories for hundreds of applications – including some really unusual ones, too. And did you know that FUCHS lubricants are used in saucepans, washing machines, home trainers, and plastic bottles? Below is an overview of some of our fascinating and unusual applications, which also have international growth potential.

By Silke Wernet



AUTOMOTIVE

- Boats and ships
- Buses
- Chainsaws
- Dual-clutch transmissions
- Lawnmowers
- Milking machines
- Scooters
- Shock absorbers
- Trains





INDUSTRIAL

- Air-conditioning systems
- Automatic door closers
- Conveyor belts
- Elevators
- Escalators
- Excavators
- Fork-lift trucks
- Refrigerators
- Sluices
- Supermarket refrigerated display cases
- Turbines





LUBRICATING GREASES

- Baby strollers
- Bicycles, e-bikes, pedelecs
- Bridges (bridge bearings)
- Dryers
- Home trainers
- Roller blind drives
- Seat adjusters
- Skateboards
- Washing machines
- Windshield wipers



METAL PROCESSING

- Bodywork
- Cable cars
- Cutlery
- Exhaust systems
- Implants (e.g. artificial hip joints)
- Saucepans
- Screws
- Water/wastewater pipes





SPECIAL APPLICATIONS

- Car headrests
- Car seat belt closing mechanism
- Car sunroofs
- Garage door guide rails
- Hinged awning brackets
- Ice cream cone baking ovens
- Manufacture movement
- Oxygen cylinders for divers
- Plastic bottles
- Sausage slicers
- Springs for cable mechanisms in vacuum cleaners





SERVICES

- Analytical services
- Chemical Process Management (CPM)
- Coating services
- Tailor-made development
- Condition monitoring
- Special services for food and beverage processing (LCCP)
- Open gear services
- Technical services

A STRONG BOND

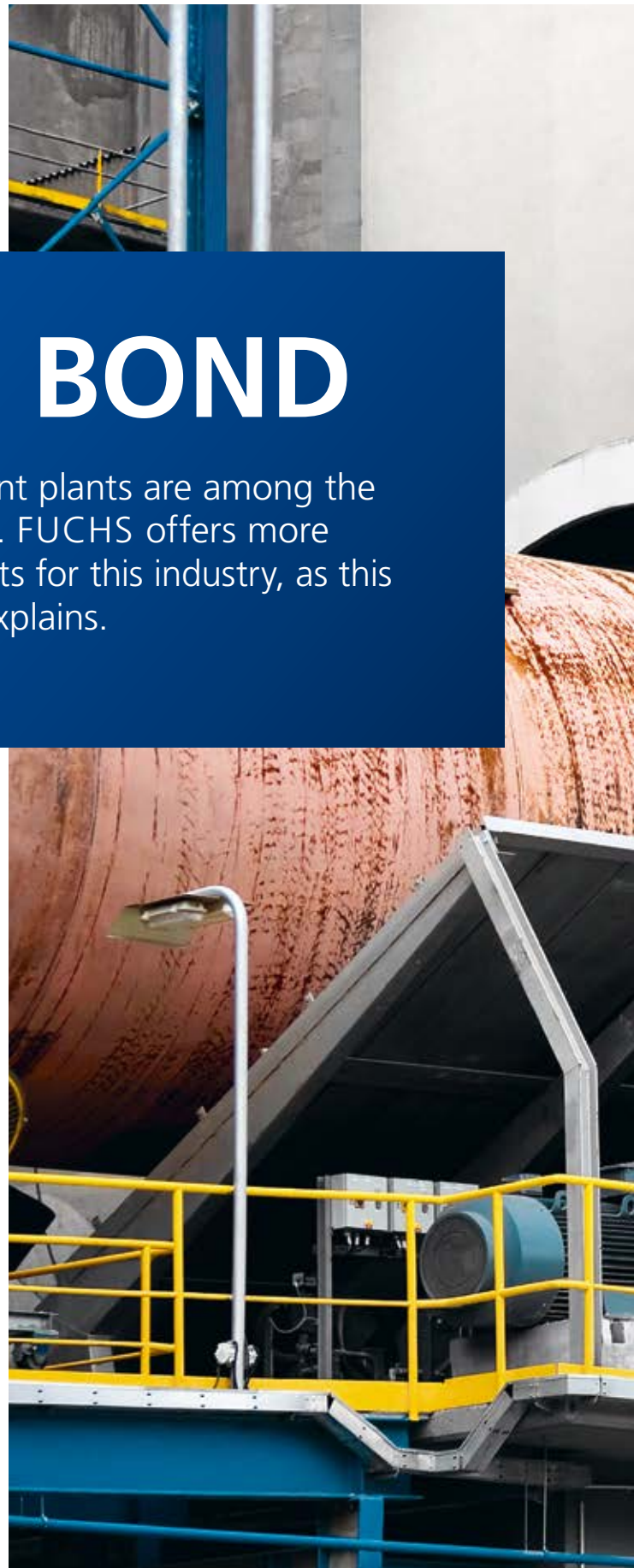
Heat, vibrations, huge loads – cement plants are among the most demanding users of lubricants. FUCHS offers more than just a range of specialty products for this industry, as this story of an exemplary partnership explains.

By Ulrich Pontes

“When people who don’t work in this industry walk in, their jaw always hits the floor.” Martin Tebeck knows that he works in a very special and unusual environment, in a plant containing mills weighing hundreds of tons, a rotary kiln almost the length of a soccer field and other gigantic installations. Even people who are used to being surrounded by technology and machinery cannot help but stand in awe at what they see. “This is not all fun and games,” says Tebeck with a smile. “We have all the fun stuff: loads and machinery of massive proportions – plus it is always hot in here.”

Tebeck heads a team focusing on preventive and condition-based maintenance at the Beckum-Kollenbach cement plant, which belongs to the Holcim Deutschland Group – one of Germany’s leading manufacturers of building materials. In other words, it is his job to ensure that the machinery and installations in the plant operate without interruption and that any downtime – except during the annual plant overhaul – is avoided. Lubrication plays a key role here. “It might make up just 5% of our maintenance work, but it is one of the most important tasks of all for ensuring the availability of our machines.”

The lubrication process is not only crucial, but also complex – and an important cost factor. Hundreds of places in a cement plant need oils, greases or specialty lubricants that, depending on where they are applied, need to withstand huge loads,





»I can call the FUCHS LUBRITECH service engineer whenever I need his support. He gets here in an instant, which is immensely important to us as a round-the-clock plant. «

MARTIN TEBECK | HOLCIM-OWNED BECKUM-KOLLENBACH CEMENT PLANT



Holcim Deutschland Group

The Holcim Deutschland Group is one of the leading building materials manufacturers in Germany and the Netherlands. In addition to its three core areas of aggregates, binders and concrete, it also offers complete building materials solutions, logistics services and complementary services. Around 1,800 employees work at more than 130 sites in Germany and the Netherlands – including the Beckum-Kollenbach cement plant, which joined the Group in 2015. As a wholly owned subsidiary of the Switzerland-based LafargeHolcim Ltd, Holcim Deutschland also benefits from the network and experience of this global market leader.

vibrations, dust and heat – sometimes all at the same time. Of course, this means that many different types are required. The Beckum-Kollenbach cement plant, for example, used to apply 60 different lubricants from 20 suppliers – but then the company invited tenders for a standardized, overall lubricant concept. The final contract was awarded to FUCHS LUBRITECH.

That was in 2000. Since then, the FUCHS subsidiary has provided the cement plant with comprehensive support. All the lubricants used in the plant are FUCHS products, and FUCHS also provides a range of consulting and other services. Furthermore tribology training sessions are organized for the plant employees. “As a result, we have reduced the number of lubricants in use to just 25,” says Klaus Holz. The head of Technical Services at FUCHS LUBRITECH was in charge of formulating the original lubricant and service concept back in 2000. This reduction in the number of different lubricants meant that higher-quality lubricants were used than before, but at the same time longer change intervals and lower consumption were achieved – in short, the company benefited from major savings. “If you include labor input and disposal, this standardized concept helped the plant to cut its lubricant-related costs by more than 30%.”

But if you ask why this partnership continues to this day, the cost factor is just one – albeit fundamental – reason. “Of course, we have to constantly keep a close eye on the market and compare prices,” says Martin Tebeck. But, as he says, the quality – in terms of both products and service – is right. “Whenever I call FUCHS LUBRITECH with whatever question or query I may have, I always receive highly professional support.” The most important aspect, however, is the service – particularly for open gears. These huge, exposed gear designs are responsible for driving the rotary furnace and cement mills. “This is one of the most complicated tasks,” explains Günter Huschitt, Team Leader Application Engineering. “If the lubricant fails to do its job here, it can result in serious damage.”

To ensure that everything functions smoothly, a qualified service engineer regularly visits the cement plant. Measurements are performed on the machines, their condition is documented, and minor instances of damage are repaired. The service engineer is also available at any time as permanent contact person. And there was another situation when Martin Tebeck was especially pleased to have the service engineer's support: when a special grease was used to run in new gears in the cement mill drives. "That's a really nerve-racking task. You only get to do that two or three times in your career."

FUCHS LUBRITECH, in turn, benefits in more ways than simply enjoying the sales from its long-term customer: When it developed a new adhesive lubricant for open gears, the Beckum-Kollenbach cement plant was the pilot customer. "Of course, new lubricants undergo rigorous testing in our laboratory, but things are always a bit different in practice," says Klaus Holz. Thanks to this long-standing, trusting relationship and partnership, an initial application test was conducted in Beckum. "This played a major role in the success of CEPLATTYN GT 10," says Holz. "With this product, we are currently an innovation leader on the global market." ■

Savings in the Holcim-run Beckum-Kollenbach cement plant thanks to the comprehensive lubricant and service concept from FUCHS LUBRITECH

1/20

The plant used to have 20 different lubricant suppliers. Now it has just one: FUCHS.

60
25



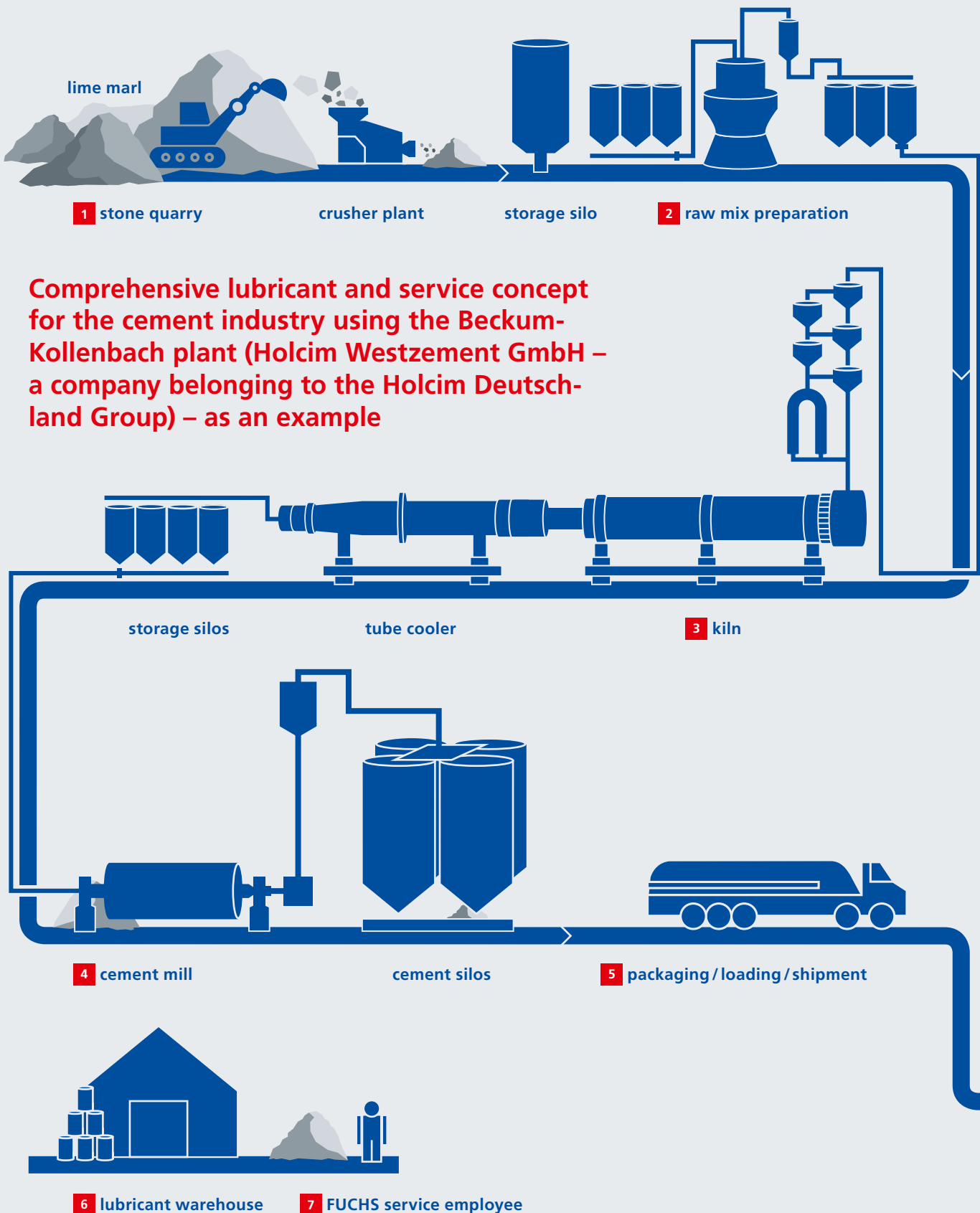
The plant used to apply 60 different types of lubricant. This number has been reduced to 25.

800 → 600

The concept also involved combining lubrication points, thus reducing the number of these by around a quarter.

-30%

Standardization measures led to a more than 30% reduction in lubricant-related expenditures (materials, labor input and disposal).



1 Mobile machinery such as excavators, conveyor belts and crusher plants require a wide range of different lubricants such as engine, gear and hydraulic oils. Challenges: dust, weather conditions (heat, cold, rain, snow).

2 The mills, mixers, separators, silos, conveyor belts and screens in the raw mix preparation plant require gear and hydraulic oils, roller bearing greases and adhesive lubricants. Equipment and lubricants must be able to withstand high levels of stress, dust and vibrations.

Martin Tebeck: “From the raw mix preparation stage onward, we operate around the clock – all the subsequent steps are immensely important for us. Whenever possible, we try to operate throughout the year without any interruptions – except when it is time for the annual overhaul.”

3 The outside of the 80-meter-long rotary furnace, which has a diameter of 5.2 meters, can reach temperatures as high as 350°C. It is driven by an externally positioned, open gear, which is lubricated with a specialty adhesive lubricant.

Martin Tebeck: “While downtime with any other facility would be merely annoying, with the kiln it would be a disaster.”

4 The cement mills include the biggest open gears in the Beckum-Kollenbach plant: Gears with a diameter of 6.5 meters and a width of 50 centimeters turn a load weighing 600 tons 14.6 times per minute. To cope with these huge loads as well as all the associated vibrations and dust, a high-performance adhesive lubricant is necessary.

In 2012, the FUCHS LUBRITECH-developed adhesive lubricant CEPLATTYN GT 10 was put to the test for the first time under real-life conditions on the open gear of one of the two cement mills. Klaus Holz: “This joint test played a crucial role in the huge success of the product. This was made possible thanks to the excellent, long-standing, trusting partnership that we enjoy with Mr. Tebeck.”

5 The packaging/loading/shipping stations require a whole range of lubricants such as gear oils, hydraulic oils and roller bearing greases.

6 The lubricant warehouse on the plant premises in Beckum-Kollenbach is a “consignment stock”: The lubricants there belong to FUCHS LUBRITECH. Once they are removed from stock and this process has been recorded in the inventory management system, they become the property of the cement plant and are invoiced.

7 At least four times a year, the Beckum-Kollenbach cement plant receives a visit from a FUCHS LUBRITECH service engineer specializing in machinery used in the cement industry. He checks and documents the condition of the machines, adjusts the lubrication if necessary and carries out minor repairs on open gears. This service is accompanied by a state-of-the-art online reporting system that the customer can use to access measurement trends, photos and infrared videos at any time via an app.



2016 IN MOTION

IMPROVED TESTS FOR GERMS

FUCHS Spain's microbiology lab tests for the entire Fuchs' Group the microbiological contamination of water-oil emulsions used in metalworking applications. For even better testing procedures, the researchers in Spain now use a special freezer that cools to minus 80 degrees Celsius. This guarantees the long-term preservation of the independently adapted bacterial strains – a very important aspect for testing.



ACQUISITION OF ULTRACHEM INC.

FUCHS acquires the industrial oil specialist ULTRACHEM INC. and thus expands its portfolio in the USA in this sector. The company, based in Delaware, generated sales revenues of € 15 million in the financial year 2015/16.



TEST FACILITY IN A NEW DIMENSION

Opening of the new test facility at the Mannheim HQ. The new building on the former site of Plant 1 has around 1,200 square meters of floor space, offering room for 15 new test rigs and expanding the "old" building with 35 test rigs. FUCHS is thus increasing its capacity for tests performed under real-world conditions, which are a key component of the lubricant development process. The new test facility will test automotive transmission fluids as well as shock-absorber and hydraulic oils, among others.

FUCHS – AN AGILE COMPANY

FUCHS in motion: After milestones such as defining the mission statement “LUBRICANTS. TECHNOLOGY. PEOPLE.”, bringing employees together at international network meetings and developing the brand house with FUCHS as the umbrella brand, the leadership principles were formulated and rolled out in the Group’s worldwide change process in 2016.

ACQUISITION OF CHEVRON DIVISION

FUCHS acquires Chevron’s global business with white oils and lubricants for the food industry, which is integrated into FUCHS LUBRICANTS CO. (USA). With the acquisition and new distribution partnerships, FUCHS wants to expand the scope of support for customers in the food industry.

SUSTAINABILITY LEADER

FUCHS competes successfully against 800 companies to win the German Sustainability Award 2016 in the category ‘Germany’s Most Sustainable Medium-Sized Company’ – on its first application. “Numerous measures with quantifiable successes prove that also a lubricants manufacturer can incorporate sustainability along the value chain as well as in its own business model and is able to continuously improve its sustainability level,” explains the jury. The most important German award in this area honors outstanding sustainability achievements in business, local communities and research.



LESS DUST IN MINING

At the request of the Mining division, the FUCHS Key Working Group Mining R&D tests and develops effective products for dust suppression in mining. In the future, RENOCLEAN AIR SPRAY-DOWN, HOLD-DOWN and LOCK-DOWN are to ensure the better protection of health and the environment from excessive dust contamination in all stages of the mining process above and below ground.



全球



Tuesday, 7:30 am
On the way to work



通勤者

GLOBETROTTER

More than 100,000 customers worldwide and 55 companies in over 45 countries around the globe. FUCHS is where its customers are and supports them in the most important growth countries in the world. This is also Daniel Henn's job: He has been responsible for FUCHS LUBRITECH's local production facility in Shanghai for three years – and it sometimes feels like a balancing act between his old and his new home.

By Cornelia Theisen

When Daniel Henn received the offer to go to China and manage the local production facility there for FUCHS, he hadn't even finished his bachelor thesis. That was in December 2013. The 29-year-old remembers it as if it were yesterday. The manager at FUCHS LUBRITECH had given him a few weeks to think it over. But he only had to sleep on it for one night.

**"I thought: I'm young and unattached – if not now, when?
I had no idea what I was in for."**

Three years have passed since then. Henn now lives and works in Shanghai, where he is responsible for FUCHS LUBRITECH's local production facility. The third-largest city in the world is 8,916 kilometers from his hometown of Kaiserslautern. There are of course cultural differences. In the early days, he recalls, everything seemed amazing. He took photos non-stop. There was a lot





» Of course I do get homesick sometimes. But mostly I think: Wow, you have this job and live in this city – that’s great! «

DANIEL HENN | SENIOR MANAGER PRODUCTION AND PROCESS, FUCHS LUBRICANTS (CHINA)

Wednesday, 2:30 pm
Quality meeting at the plant



Thursday, 12:15 pm
Off to lunch

Friday, 10:00 am
Weekly meeting of the Operations Team





to get used to. Especially the traffic. It is chaotic – the streets full of bikes, electric scooters and cars. But the worst thing was not being able to read anything at all.

“In Europe, it almost doesn’t matter where you are. Even if you don’t understand the language, you can type individual words into your phone and translate them. With the characters here – not a chance!”

This has since changed. He can now speak the language well enough for routine and basic communication. And his reading is also getting better now. It has to, because Daniel Henn has a lot of work to do in the Asian growth country. China is one of the most important markets for FUCHS, Shanghai one of the FUCHS Group’s largest production locations. The LUBRITECH production facility currently covers forming lubricants for the forging industry, open gear lubricants and solid film lubricants for dry lubrication. The latter are applied to customers’ components in the coating center. The direct contact with these customers is just one of his many tasks. The majority revolve around optimizing processes and increasing efficiency – in production itself, but also in the sourcing and purchasing of raw materials, for example. In addition, he is responsible for the equipment and utilization of the new factory building in China. And he is helping with the overhaul of the concept for FUCHS Japan and the associated factory renovation in Iga Ueno.

“I have grown into my tasks here. I came fresh from the Mannheim University of Applied Sciences and FUCHS offered me a managerial role – a once-in-a-lifetime career opportunity and a great show of confidence.”

When Daniel Henn came to the Asian megametropolis, FUCHS had already played an important role in his life for over ten years. First the apprenticeship as a chemical technician at LUBRITECH in his hometown of Kaiserslautern, then two years in process support at the same site, while completing his vocational baccalaureate diploma part-time. When he finally decided he wanted to study at university, his superiors supported him.

So he enrolled for process engineering at Mannheim in 2010 – and returned in the semester breaks as a student employee. He spent his practical semester in London, at FUCHS of course. And he also wrote his bachelor thesis with the company.

“FUCHS LUBRITECH has supported me ever since my apprenticeship. The feeling of security this has given me the entire time is something special.”

Just one day after handing it in, in early 2014, Henn was finally sitting on a plane, together with the Managing Director of FUCHS LUBRITECH on the way to a look-and-see trip. FUCHS offers this to all “expats,” i.e. specialist personnel who are to work for a number of years at a location abroad. The final decision does not have to be made until afterwards. Five days to get to know the working environment, future colleagues and the home-to-be. Then you know if you have a good feeling – or why you do not, says Henn.

“I had never been to Asia before, let alone China. But by nature I am curious about other cultures and professional challenges.”

What followed was a total of three training sessions. Two in the LUBRITECH plants in Eching and Chicago, where he could familiarize himself with the processes that would await him. Intercultural training taught him a bit about Chinese customs before he arrived. This was good preparation for coping with his new everyday life. In some respects, he barely had to adjust at all. The choice of cuisines is huge, for example: Asian, French, Russian and of course German restaurants alongside traditional street kitchens and fast food outlets. Just like in every large international city. And he still eats muesli for breakfast, Henn says. Preferably one that he brings over from Germany. The leisure activities, however, that he previously

engaged in, were difficult to carry over one-to-one to his new life. While Henn had always played soccer in Germany, now he prefers to jog. Since he has lived in China, he no longer meets his parents at dinner but on screen: Contact with home is mostly online – by WeChat, a Chinese social network.

Henn now lives in the French Concession. The neighborhood looks almost like a small French town: Avenues with lots of trees and old Art Deco villas. This, he says, helped him feel at home here. His friends also do him good. After three years in Shanghai, his circle of friends is just as varied as the city. Germans, Americans, Australians and even some Chinese, but most of the latter have worked or studied abroad.

“Internationality connects us. People who have been through similar changes simply have a better understanding for each other.”

The colleagues with whom he spends his lunch break are often also expats like him, or have pursued international career paths. Like all department heads of the Operations Team at the site, he belongs to the team led by Cathy Wu, COO of FUCHS LUBRICANTS (China). He is the only German there; another colleague comes from England. Although communication at FUCHS China is almost always in English, learning Chinese was important to Daniel Henn from the start.

“I would have got by without Chinese. But I want to take as much as I can away from my time here. By learning the language, I bridge the cultural gap somewhat.”

The 29-year-old describes China as a country that is changing incredibly quickly. For example, infrastructure projects are completed at a pace that transport users in Germany can only dream of. But for this very reason, lots of Chinese people expect problems to be solved quickly.

“Satisfying Chinese interests while working according to a German company’s expectations often requires a diplomatic middle course.”

Overall, he describes the nearly three years that he has now lived in Shanghai as a major enrichment – professionally and privately. Whenever he receives visitors from Germany, two to three times a year, he takes the opportunity to travel with them. In this way, he has already seen a lot of China and nearly all of South-East Asia. Thailand, Vietnam, Japan, the Philippines and Cambodia. Myanmar is coming up in 2017. When traveling, like in his career, Henn says, he has learned to think outside the box, to leave the German or European view of the world behind sometimes and to combine the best parts of everything. In this way, he tries to comprehend decisions that he may not have understood at first.

“Sure, I have German roots, and that has shaped my character. But living abroad has also made me open to the perspectives and approaches of other mentalities.”

Daniel Henn does not yet know when, how or whether he will return to Germany. The contract at FUCHS China initially lasted two years; now it has been extended indefinitely. Of course, he says, he is often asked when he is coming back. He is happy in Shanghai for the moment, but he wants to move on at some point. Whether he will then go to Germany or somewhere else remains to be seen.

“I don’t want to rule out returning to Germany someday. I am open to it – but also to other countries. It depends where there is a job for me at FUCHS in the future.”

From spring 2017, Henn will do an MBA, a Master of Business Administration, for the first time in a part-time program of the Mannheim Business School together with Tongji University in Shanghai. Then he will at least be back in Germany more often. At the moment, he is only there around twice a year. In order to minimize costs, he usually combines professional appointments with a few days in his hometown of Kaiserslautern. He was recently back again for the Christmas holidays. This was convenient, because he was nearly out of muesli. ■



Saturday, 9:30 am
Relax and recharge



Sunday, 9:00 pm
Dinner at a cookshop
around the corner



FACTS AND FIGURES

Brief profile

Holding company: FUCHS PETROLUB SE, headquartered in Mannheim, Germany. World's largest independent lubricant manufacturer with more than 100,000 customers, including automotive suppliers, OEMs, and companies from the mechanical engineering, metalworking, mining, aerospace, power generation, transport, agriculture and forestry industries.

Founded: 1931

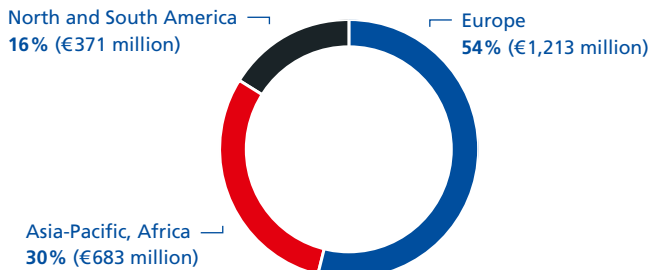
Employees: Around 5,000, of which more than 400 in research and development (R&D)

Locations: 57 operating companies and 34 production plants in over 45 countries

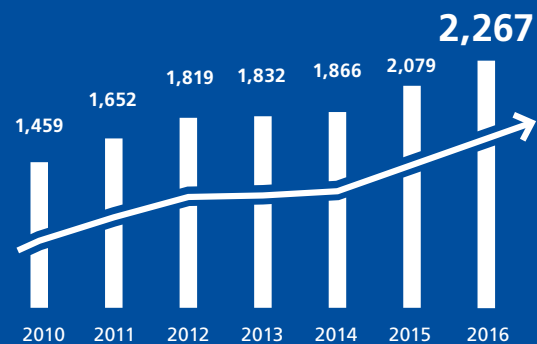
Products: A full range of more than 10,000 lubricants and related specialties for hundreds of applications in the key automotive, industrial, metalworking, special applications, lubricating greases and services categories.

FUCHS lubricants meet the highest quality standards and stand for performance and sustainability, safety and reliability, efficiency and cost savings.

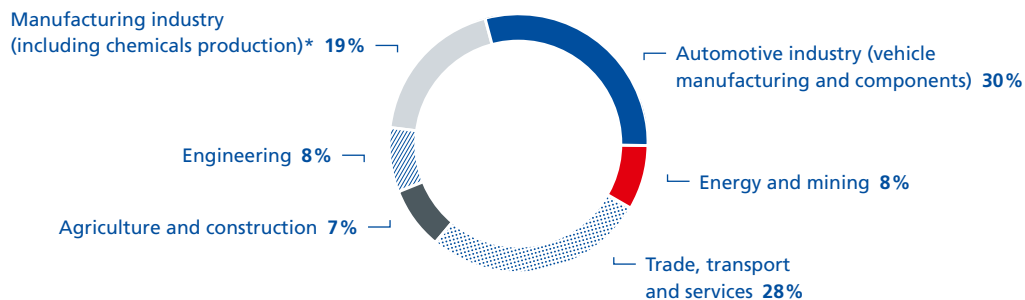
Sales revenues by customer location in 2016



Group sales revenues up €188 million in 2016



Breakdown of group sales revenues by customer sector 2016



* Manufacturing industry = producer goods, capital goods, consumer goods.

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