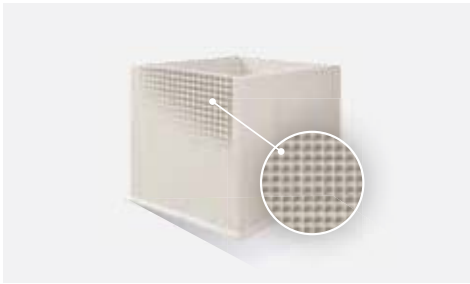


Development, Highlights, Facts & Figures

Annual Report 2018





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In the interview, Franz Lübbers, CEO Röchling Industrial, talks about the development of the division in 2018



“This represents a fundamental change of strategy.”

In the interview Franz Lübbers, CEO Röchling Industrial, talks about the development of Röchling Industrial in 2018, the fundamental change in strategy that Röchling Industrial is using to further expand its leading market position and what digitalisation means for the development of the division.

Looking back on 2018, what's your assessment of Röchling Industrial's business performance?

Franz Lübbers: The first half of the year was characterised by high demand for our Business Units Thermoplastics and Machined Components, which declined somewhat in the summer but then rose again. The same is true for our fibre-reinforced plastics activities in the Business Unit Composites. We're seeing a significant revival and recovery of the business situation here. We can say that 2018 was a very successful year for Röchling Industrial overall. The decisive factors for our success were above all the strong team performance and the great commitment of all employees.

One key point in 2018 was the definition of the new corporate mission statement, which lays the foundation for success and the achievement of growth targets. What do you see as the focal point?

Definitely the “customer centricity”. Our customers take centre stage in everything we do. We must ask ourselves how we can further improve our products, technologies, services and skills across all Business Units. This is the only way we can offer all customers in the various industries the best possible product and the best service for their application. This industry focus represents a fundamental change in strategy. To date, each Business Unit has marketed its

products independently based on materials. This strategy was adapted in 2018 with the introduction of industrial management.

What are the advantages of this new focus?

With the industrial focus, we at Röchling Industrial ask ourselves how we can offer our customers the greatest benefit with our entire product portfolio. We create added value with these synergies and lay the foundation for further growth. We make our entire range visible and usable to our customers from all locations in the individual target industries. This requires close cooperation and networking.

Röchling Industrial now has more than 40 sites. What significance does an ever-growing group of companies have for this strategy?

Currently, each of our subsidiaries is successfully run by a managing director. We do not intend to change this recipe for success by setting up central structures in our division via which we can remotely micro-manage the subsidiaries. Only our

subsidiaries are close to the market and have the best knowledge of local customers. At the same time, with so many locations, we have a great deal of knowledge about products, processes and applications. We want to bring this know-how together and specifically promote cooperation across locations and Business Units. However, in order to allow

the companies to concentrate on their actual role of market cultivation, we must control certain roles and activities centrally, such as IT and digitalisation; in this regard, we use uniform structures to facilitate cooperation between the locations. This also includes a central, coordinating research and development department. That's why we created Corporate R&D in 2018.

In your opinion, what role does Corporate R&D play in the division's continuing growth?

Corporate R&D is an essential pillar for Röchling Industrial's success. As a central development department, it pools, coordinates and prioritises all research and development activities across all locations and Business Units. Corporate R&D records existing know-how and makes it usable for the entire company in a sustainable manner. The development of new products requires a close exchange with our industry managers, whose main task is knowing today what customers in the industry they work with expect from their suppliers tomorrow. In the future, it will no longer be sufficient to have a product ex stock at a certain



We want to bring this know-how together and specifically promote cooperation across locations and Business Units.

price. We must develop new product ideas for the individual industries and thus generate competitive advantages for our customers. Digitalisation also has an important role to play here.

In concrete terms, what does digitalisation mean for the development of Röchling Industrial?

Intensive exchange between our employees worldwide is a key factor for success. It's about how we communicate and exchange knowledge with each other. Email will certainly not be sufficient for this in the future. Our employees must be better able to network across hierarchical levels and national borders. As a company, we must offer suitable tools for this purpose, on which we are currently working intensively at Röchling. When it comes to digitalisation, the creation, generation and use of data also play an elementary role. We are currently creating a uniform basis in this regard by bringing our sites up to the same technological standard; this will make communication and data exchange easier. This means that we're not only going to network people, but also our factories and machines in order to achieve productivity advantages, make even better use of existing resources and gain speed. And finally, it's a question of making even greater use of the possibilities offered by digitalisation to communicate with our customers. To this end, we will build open platforms and offer interfaces to our customers' systems. But it's also important to me that we find a healthy direction with regard to what is feasible.

What challenges does this pose for the company and its employees in particular?

Our qualified employees are crucial for achieving our challenging goals. The topic of human resources is becoming increasingly important, especially in light of the skilled workers shortage, which had not been foreseeable five years ago. By this we mean, on the one hand, qualifications for our employees, who will be working in increasingly modern facilities and workplaces in an increasingly digital world. On the other, we also need to change the way we present ourselves as a company, as an employer, and how we manage our employees. Young people today have completely different expectations of the way we work together than it used to be the case. We also need to prepare our managers for this with extensive training.

”

Our qualified employees are crucial for achieving our challenging goals.

How was the first quarter of 2019 and what is your prediction for the rest of the fiscal year?

In the first quarter of 2019, we were fully on target with all Business Units and subsidiaries. I should highlight North America; it has the

strongest result at present. However, all other locations in our division are also making very good progress. I am very confident that we will achieve the targets we have set ourselves for 2019. We cannot predict how political issues such as the US–China trade dispute and Brexit will develop. But the forecasts for our target industries are good. I am therefore very optimistic about further developments this year.

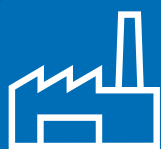
Röchling Industrial invested over EUR 50 million last year. Will you continue to do so?

We have always invested heavily in Röchling Industrial. As early as 2017, for example, we launched an investment programme for the Business Unit Thermoplastics and constructed new plants and buildings, particularly at our sites in Haren and Lahnstein. We also significantly expanded capacity in North America in 2018.

On a par with the previous two years, we're investing EUR 60 million in 2019. In the USA, we're building two extrusion lines for PP and four lines for high-temperature plastics. In India, we opened a new production building for the manufacture of extrusion sheets in the spring and will do the same in China in autumn. In Haren, we are expanding existing production buildings and, with that, expanding capacities in pultrusion. We are also investing in two new thermoplastic presses in Haren, a press for fibre-reinforced plastics and will begin operating an extrusion line for high-performance PP in July 2019.

The ground-breaking ceremony for the new "Industrial Center" at the Haren site was held in summer 2019; it is set to open in autumn 2020. This modern office building will above all strengthen our innovativeness. Corporate R&D and others will move into their offices in the Industrial Center and develop innovative products with the new possibilities there.

Over the next few years, we will continue this strong investment in all areas to expand our leading market position worldwide. We're focusing primarily on innovations, new products and increasing the value of our products.



Empowering Industry.

What does our slogan “Röchling Industrial. Empowering Industry.” mean? And what claim do we make for ourselves?

“Röchling Industrial. Empowering Industry.” – this is the slogan of our division – in English, of course, because our markets are international. “Empowering” means “to give strength, power or ability” and “Industry” refers to the industries of our customers, who come from all areas: from general mechanical engineering to the electrical industry, from playground construction to the food industry.

Our customers use our plastics to develop products for all areas that determine our lives. The world’s population is growing. How will people be reliably and safely supplied with energy in the future? Where are our foods produced and processed? How do people get from A to B quickly and safely by public transport? Together with our customers, we see these questions as an opportunity to develop new, innovative products. Our plastics improve industrial applications, increase efficiency or make new developments possible in the first place.

We’re the only company in the world to offer a product range of thermoplastic and composite semi-finished products and machined components with almost any dimensions. We align our actions with the individual industries; our ambition is to find the best solution for our customers’ applications across all materials. “Empowering Industry” means thinking from our customers’ perspective. No other supplier in the world can offer its customers such a broad knowledge of the properties, processing and application possibilities of plastics as us. But “Empowering Industry” also requires us not to lose sight of our claim: to be better than others in what we do and to always become better. “Empowering Industry” is an ongoing, never-ending process that strengthens the competitiveness of our customers in addition to our own.



A photograph showing two technicians in blue uniforms working on the interior of an aircraft fuselage. One technician is pointing upwards at a component on the ceiling, while the other looks on. The scene is brightly lit, and the floor is covered with various tools and equipment. A large blue circular graphic is overlaid on the right side of the image, containing the text.

**Our customers
are central to us!**

Company mission statement

We are industry-oriented.

Our focus is on our customers' needs, not our products!

- We offer our customers the best possible solutions for their individual applications.
- We therefore inform our customers about our comprehensive range of products and services and our unique materials and applications know-how.

We are innovative.

Our innovations help our customers improve.

- We listen to our customers to learn how to help them with our innovations.
 - To us, innovation means that a new solution is better than the previous one!
 - We develop new or we optimise existing products for known applications.
 - We find new applications for our existing products.
 - We develop products with new functions that make digitalisation usable.
- We generate ten percent of our turnover from new, innovative products. “New” to us means “not more than three years old”.

We create added-value for our customers.

Our customers profit from working with us.

- Our corporate activity as a whole creates added value and therefore competitive advantages for our customers.

We use the possibilities that digitalisation offers.

- We are creating a uniform IT structure for Röchling Industrial.
- We use digitalisation to improve our processes and procedures.
- We use digital media to communicate with our business partners.

We are growing in the Americas and Asia.

- We are globally present.
- We are growing worldwide by our own strength and by targeted acquisitions.
- We are growing more than average in the Americas and Asia.

Highlights 2018

At a glance: global highlights 2018 at Röchling Industrial
Acquisitions, openings, anniversaries & awards



New name: Fischer GmbH Kunststoff Präzision is now Röchling Industrial Laupheim GmbH

January

Fischer Kunststoff-Präzision becomes Röchling Industrial Laupheim

Following the take-over of the Laupheim-based plastics processing company Fischer GmbH Kunststoff-Präzision, the company has got a new name: Röchling Industrial Laupheim GmbH. The rebranding continues Röchling's consistent integration of the subsidiary into the international group. The new name "Röchling Industrial Laupheim GmbH" illustrates the company's affiliation to the Röchling Group and, above all, highlights the marketing strategy of the Industrial division which

incorporates the plastics processor from Laupheim. The new company name consistently focuses on the industries and thus on customers.

February

New ISO Class 7 cleanroom

Röchling in Gloucester, Great Britain, has put a new ISO Class 7 cleanroom into operation. This will allow the subsidiary to further expand its range of high-precision machined parts made of thermoplastics specifically for medical technology, pharmaceutical technology, aviation and semiconductor technology. Mike Knowles, Managing Director for Röchling in Gloucester, explains:

"This expansion will strengthen our presence in these markets and allow us to provide our customers with even better service. At the same time, very high demands are placed on components for medical technology, pharmaceutical engineering, aviation and semiconductor technology in the areas of dimensional accuracy and cleanliness. We machine complex machined parts according to customer drawings on our modern CNC systems. In the new cleanroom, the parts are cleaned, packaged and identified according to specific requirements and according to the customer's request by our trained employees."



Celebrating their 25th anniversary: the Röchling Engineering Plastics sales team in North America

the leading distributors in the USA for plastic sheets, round rods, hollow round bars, films, adhesives, sealants and materials for prototype development. Röchling was honoured for its excellent customer service, strategic customer support and joint strategic growth with Curbell.

May

New building in Bocairent

Röchling Plásticos Técnicos in Bocairent/Spain has expanded its location by around 1,500 square metres of hall space. The new building creates space for the expansion and further growth of the site. Customers will benefit above all from shorter delivery times and even better service. This expansion shows Röchling commitment to its location in Bocairent, taking account of the subsidiary's strong growth in recent years. During the inauguration ceremony, Managing Director Sebastián Martínez said: "My thanks go especially to the Röchling Group for their high level of trust, and

April

Röchling Ontario celebrates its 25th anniversary

Röchling Engineering Plastics, Dallas/North Carolina, celebrated the 25th anniversary of its location in Ontario, California, with an open house. Opened in 1993, the West Coast sales office and warehouse has been supplying products and services to customers in eleven western US states for a quarter of a century. Around 50 important business partners attended the open house and were welcomed by employees

from Ontario and Dallas. With the motto "Welcome to the World of Röchling", Röchling Ontario presented itself as part of a global company that is proud to offer personal and regional customer service.

Supplier of the year

Röchling Engineering Plastics in North America has been named "Supplier of the Year 2017" by Curbell Plastics Inc. of Orchard Park, New York. The Röchling sites in Dallas/North Carolina, Ontario/California and Orangeville in Canada received the award. Curbell Plastics is one of



Röchling Engineering Plastics in North America was honoured by Curbell Plastics



New building in Bocairent: Röchling Plásticos Técnicos has expanded the site by around 1,500 square metres of hall space



Opening ceremony:
Röchling Maywo
expanded site in Bad
Grönenbach

to the town for their cooperation. This enabled us to quickly realise the expansion of our location.”

June

25th anniversary in Lützen

The Röchling Lützen/Germany site celebrated its 25th birthday with a large summer party. In addition to retired employees, all current employees were invited along with their partners and children. In his speech, Managing Director Joachim Gorzitze reviewed the history of the company and emphasised its employees' great commitment to growth: “You are our greatest asset. Without you, we would not be so successful.” Employees were given the opportunity to show their children where their mum and dad work in a company tour. A lively programme with wild boar on a spit, children's make-up and a live band ensured a good atmosphere for young and old. The evening was rounded off with a swordsmen show and a belly dance group.

Röchling Maywo in Bad Grönenbach expanded

Röchling Maywo GmbH has officially opened its logistics hall and the extension to its production facilities in Bad Grönenbach/Germany. With this five-million-euro investment, Röchling is strengthening its position as Europe's leading manufacturer of vacuum formable sheets and films made from thermoplastics, creating 25 new jobs in the process. The operational site has been expanded by almost 10,000 square metres

to incorporate a warehouse and production hall covering 5,000 square metres as well as a large employee car park. Managing Directors Ingrid Teichmann and Florian Helmich opened the new building together with Bernhard Kerler, First Mayor of Bad-Grönenbach, and Franz Lübbers, CEO Röchling Industrial.



Anniversary: Röchling Lützen celebrated its 25th birthday



Groundbreaking: Röchling Hydroma invests in Ruppertsweiler site

August

Röchling Hydroma invests in Ruppertsweiler site

Röchling plans to make substantial investments in the further gradual expansion of Röchling Hydroma GmbH at the Ruppertsweiler/ Germany site until 2021. District Administrator Dr. Susanne Ganster and Miriam Heinrich, Managing Director of the Business Promotion Association of South-West Palatinate, accepted Röchling Hydroma's invitation to the ground-breaking ceremony for the next construction phase, which took place in August 2018. Construction of the new production hall began at the start of September. Gerold Fatscher, Managing Director of Röchling Hydroma GmbH, and Dietmar Telgenkämper, Business Unit Director Production and Engineering at Röchling Industrial, welcomed the guests and informed them about

the plastics processor's construction projects. "The expansion will create a new production area in the Business Unit Machined Components at our site. We are thus investing above all in the development of punched components and machined drawing parts made of thermoplastics," explained Fatscher.

November

Röchling takes over Schwartz GmbH Technical Plastics

Röchling Engineering Plastics SE & Co KG, Haren, took over the plastics processor Schwartz GmbH Technische Kunststoffe based in Xanten, Germany. An international group of companies, Schwartz GmbH specialises in the manufacture of moulded components from cast polyamide. It offers large volume and heavy-duty ready-made engineering plastic parts to virtually any industry. The Schwartz Group employs more than 240 people at four locations in Germany, the Czech Republic, China and the USA. Franz Lübbers, who is responsible for Röchling Group's Industrial division as CEO, says: "With this acquisition, we will enhance our expertise with new technologies. We anticipate synergies with our global sites that manufacture machined components."



New at Röchling Industrial: Schwartz GmbH Technische Kunststoffe, which is now operating under the name of Röchling Industrial Xanten GmbH

Innovation



Premiere: the AIDAnova is the world's first cruise ship driven entirely by environmentally-friendly liquefied natural gas (LNG)

AIDAnova – modern LNG propulsion improves ecological footprint

Fuel tank supports from Röchling, based in Haren, in the world's first cruise ship to use low-emission LNG propulsion

The AIDAnova is the world's first cruise ship driven entirely by environmentally-friendly liquefied natural gas (LNG), which improves the ecological footprint of this ocean giant. The modern propulsion system includes fuel tank supports made of Lignostone® cryogenic from plastics processor Röchling, based in Haren, Germany. These perform a supporting role in the truest sense of the word.

337 metres long and 42 metres wide with more than 2,600 passenger cabins: the AIDAnova, built by the Meyer shipyard in Papenburg, is one of the world's biggest cruise ships. At full capacity, it offers up to 6,600 passengers transportation with a broad variety of new culinary and entertainment options, including a street food mile to whet the appetite, the first floating TV studio, an approximately 3,500 square-metre wellness area, an outdoor fitness studio, and 17 restaurants and 23 bars.

Premiere in the engine room

There's also a technological first in its propulsion: the AIDAnova is the world's first cruise ship driven entirely by environmentally-friendly liquefied natural gas (LNG), which improves its ecological footprint. Conventional cruise ships are driven by heavy fuel oil or marine diesel, for example. These produce emissions in the form of sulphur oxides, nitric oxides, soot particles and CO₂, which is why cruise ships are frequently criticised. With the new, environmentally-friendly LNG propulsion, however, the AIDAnova does not produce any soot particles or sulphur oxides as it travels, while nitric oxide emissions are reduced by up to 80 percent and CO₂ emissions by a further 20 percent.

With the new LNG propulsion, AIDA Cruises is hoping to reduce the emissions from its fleet as much as possible, and to this end it is investing millions of euros in the development and implementation of new, more efficient

environmental technologies. By 2023, two further AIDA ships will join this new generation.

LNG fuel tank

One particular challenge of the new LNG propulsion is the thermal insulation of the three fuel tanks in which the liquefied gas is stored on the AIDAnova. Liquefied gas is natural gas that has been liquefied through cooling to $-162\text{ }^{\circ}\text{C}$, meaning the shipbuilders have to permanently isolate the tanks from the ship's structure.

Röchling fuel tank supports

This is achieved using special fuel tank supports from plastics processor Röchling Engineering Plastics SE & Co. KG, based in Haren in Germany. The support bearings are made of the material Lignostone[®] cryogenic and prevent any exchange of heat or cold between the tank and the adjoining structure of the ship. Any heating of the tank would increase the energy required to cool the liquefied gas, and at the same time, the release of the cold would freeze the ship's structure.

Reliable thermal insulation

Lignostone[®] cryogenic is a laminated densified wood consisting of red beech veneers (*fagus sylvatica*) that are impregnated with thermosetting synthetic resins under pressure and heat. "In Lignostone[®] cryogenic, we have developed a material specifically for the thermal insulation of LNG," explains Christiaan van der Blij who, as Industry Manager at Röchling, is responsible for all cryogenic insulation. The material combines excellent thermal insulation with an outstanding temperature resistance of $-196\text{ }^{\circ}\text{C}$ to $+90\text{ }^{\circ}\text{C}$, as well as high mechanical strength. Van der Blij continues: "This ensures that Lignostone[®] cryogenic reliably isolates the LNG fuel tank from the ship's structure, which supports the reliability as well as the longevity of the new propulsion system."

The red beech used for Lignostone[®] cryogenic comes exclusively from western European forests, and thus as a renewable raw material it helps reduce the environmental impact of the AIDAnova.

Tank supports made from the laminated densified wood Lignostone[®] cryogenic: these permanently isolate the LNG fuel tank in the AIDAnova's modern LNG propulsion system from the ship's structure



Proven worldwide

The material from Haren and the properties it possesses have already been proven in international shipping for over four decades. Lignostone® cryogenic is used for cryogenic insulation worldwide in large tankers that carry liquefied gas. Here, the laminated densified wood insulates the vast storage tanks holding up to 165,000 cubic metres from the ship's hull and is approved by many well-known shipping classification societies, such as GL, BV and ABS. More than 100 gas tankers have been equipped with this material over the last three years alone.

The container ship “Wes Amelie” is another vessel to make use of Lignostone® cryogenic. Shipping company Wessels Reederei GmbH & Co. KG, based in Haren, Germany, retrofitted the “Wes Amelie” in 2017 as the world's first container ship to run on modern, environmentally-friendly liquefied gas.

Christiaan van der Blij summarises: “With our many years of experience, Lignostone® cryogenic offers the best prerequisites for reliable thermal insulation of the LNG fuel tanks in the AIDAnova. We are delighted that with our material, we are able to contribute to the development of new, efficient and particularly environmentally-friendly propulsion systems for cruise ships.”

Fuel tanks for LNG: more than 3,000 cubic metres of natural gas are stored in the tanks at -162 °C. The whole system has to be set up to accommodate this low temperature. Reliable thermal insulation is ensured with the tank supports made of the laminated densified wood Lignostone® cryogenic





New premium material for the production of high-precision test sockets

Reliable and economical quality inspection of electronic components with EtroX® V

In the form of EtroX® V Röchling Industrial presents a new material especially for the machining of high-precision test sockets for electronic components. EtroX® V is particularly suitable for machining high-precision test sockets with extremely small boreholes. These have a minimum diameter of up to 0.1 mm and are very well formed with only minimal burr formation. The high precision of EtroX® V increases reliability and economic efficiency in the time-consuming and costly manufacture of equipment for testing electronic components.

EtroX® V is a premium material that Röchling has developed specially for the high demands of the electronics industry. Leading manufacturers of electronic components have tested the properties of the new material EtroX® V and have approved it for the quality control of their electronic components after evaluating the results. The material properties determined by Röchling Industrial in its own material laboratories according to ISO standards for tensile modulus of elasticity, ball indentation hardness and water absorption show that EtroX® V offers proven advantages over the typical materials from other suppliers tested in comparison.

Excellent machinability

At 5,300 MPa, the tensile modulus of elasticity (DIN EN ISO 527) of EtroX® V is considerably higher than that of tested reference materials and thus ensures higher strength and reduced burr formation during machining. At 275 MPa, the ball indentation hardness (DIN EN ISO 2039-1) is impressively higher than the values of comparable materials and allows precise machining of

components. The tests also show that with 0.1 %, EtroX® V has almost no water absorption (DIN EN ISO 62) and the lowest value compared to the tested reference materials. EtroX® V combines very low residual stress with very high dimensional stability even at high continuous operating temperatures of up to 250 °C.

High-precision test sockets and holders

EtroX® V is particularly suitable for machining high-precision test sockets with extremely small boreholes. These have a minimum diameter of up to 0.1 mm and are very well formed with only minimal burr formation. The risk of individual, defective boreholes and thus defective components is reduced. Even a single faulty borehole would lead to a complete defect in the machined part. These errors are usually only noticed during the final inspection by manual or optical tests. The softer a material is, the higher the likelihood that the positioning of individual holes will deviate. Optical position tests carried out by customers on test sockets made of EtroX® V have demonstrated especially precise positioning of boreholes. This underscores the low stress level and excellent machinability of the new premium material. In addition to the manufacturing of test sockets, EtroX® V is particularly suitable for the machining of high-precision holders for the production and assembly of smartphones, tablets and other electronic devices.

Increased economic efficiency

Röchling has developed EtroX® V specifically for the demanding quality control of electronic components. Components made of EtroX® V increase the reliability of the tests and reduce the rejection rate during the production of the test components with their high precision.

Product range expanded

With EtroX® V, Röchling is expanding its extensive product range of materials specifically for the electronics industry. Röchling offers a wide range of composites and thermoplastics for the electronics industry. In addition to insulating materials, it also provides numerous ESD modifications as well as Durostone® solder pallets made of fibre-reinforced plastics.

High-precision: EtroX® V is particularly suitable for machining high-precision test sockets with extremely small boreholes. These have a minimum diameter of up to 0.1 mm and are very well formed with only minimal burr formation





www.siemens.com/presse



No shrinkage in the vapour-phase drying process: Shield rings made of Durostone® EPX-M are used in the largest HVDC project in the world in China



Powerful line

Largest HVDC project in the world with Durostone® EPX-M

When it is about energy supply in China, you have to think big. More than a billion Chinese need power. A world-record power line, which runs across the country, goes into operation. And the largest HVDC project in the world uses shield rings made of Durostone® EPX-M from Röchling.

If you take a look at a map, you can already sense, based on the length of the route, how much technical know-how is required for the success of the project: Power is transported across the country in China 3,284 km. The power will be produced in Changji in the Northwest of the country and transported by the most powerful high-voltage direct current transmission line (HVDC) in the world deep into the East to Guquan. With a transmission capacity of twelve gigawatts, this link reaches a completely new level. For comparison: A modern nuclear power plant has an output of between one and two gigawatts.





World record power line: The most powerful high-voltage direct current transmission (HVDC) in the world

Latest generation

A leading manufacturer of transformers has developed the latest generation of HVDC transformers for the project: The first 1,100 kV transformers in the world. With an output of 587.1 megavolt ampere (MVA), they are the most powerful in the world.

Part of the new transformers are shield rings made of Durostone® EPX-M from Röchling in Haren/Germany. In 2014, Röchling was the first manufacturer to come out with Durostone® EPX-M shield rings made of glass fibre reinforced material based on synthetic resin, engineered especially for the HVDC technology. Compared to conventional material such as pressboard or laminated densified wood, the rings show no shrinkage after the so-called vapour-phase drying process. That is an important advantage for the manufacturers of transformers. Rainer Sanders, General Manager Sales Composites, explains: "Shield rings made of Durostone® EPX-M have a very high dimensional stability. Compared to classic materials, design engineers do not have to take shrinkage into consideration. That makes the planning and development easier because manufacturers can do the calculations using reliable values. Durostone® EPX-M allows for the dimensioning of the transformers with exact tolerances."

Thanks to this advantage, Durostone® EPX-M has been in use in transformers worldwide. Sanders explains: "The market has quickly recognised the advantages of our Durostone® EPX-M innovation. We are pleased that we were able to convince the manufacturers of transformers around the world with a high capacity and that they are now part of this unique HVDC project in China." The rings are manufactured in a special winding process and consist of glass fibre reinforcement and a resin matrix based on epoxy resin. Thanks to a thermal class H (180 °C), Durostone® EPX-M can boast an excellent compressive strength even at higher temperatures.

Extensive range for transformers

Rings made of Durostone® EPX-M are part of the extensive range of construction and insulation components from Röchling for the use in oil-filled transformers. For more than a century, the plastics processor has been producing the high-performance material Lignostone® Transformerwood® manufacturing sheets and machined parts such as shield end rings, shield rings, thrust rings, pressure beams and fasteners. With Trafoboard®, Röchling has since 2010 also been offering insulation material made of high-quality pressboard for the highest requirements on electrical properties.

High-voltage direct current transmission (HVDC)

With its excellent electrical properties, Röchling plastics are used in HVDC projects worldwide: For example NeAgra in India, Rio Madeira in Brazil and NorNed in the Netherlands and Norway. The high-voltage direct current transmission is used for the transmission of high electrical outputs over long distances. With HVDC technology, the three-phase current generated in the power plant is converted to a direct current inside a converter substation and then back into a three-phase current at the end of the line. Compared to a three-phase current transmission, the loss of power is significantly lower with a direct current transmission.

Latest generation: one of the first
1,100-kV transformers in the world



Substantial time-savings for tank builders



Developed especially for chemical tank and plant construction: Polystone® P CubX®, the innovative sheet with the internal cube structure

New Polystone® P CubX® tank construction sheet – rectangular tanks without steel reinforcements

With Polystone® P CubX® Röchling Engineering Plastics SE & Co. KG, Haren/ Germany, has developed an entirely new tank construction sheet especially for the construction of rectangular tanks. Polystone® P CubX® is a cross-ribbed twin-wall sheet with a unique internal cube structure. Rectangular tanks made in this way need significantly fewer steel reinforcements, if any, depending on the size of the tank. The time-savings for tank builders are substantial.

Tank builders are familiar with the problem: even quite small rectangular tanks made of solid plastic sheets for storing chemicals normally require elaborate steel reinforcement. To protect the reinforcements from corrosion, they have to be clad with plastic profiles. These have to be elaborately cut to size and then welded. With Polystone® P CubX®, Röchling has developed a new sheet which will save tank builders a lot of time. The particular feature lies in its special design.



Polystone® P CubX®: can be very easily processed using common welding methods, heating element stump, hot gas drawing and extrusion welding as well as all machining methods



Very high longitudinal and transversal stiffness

Polystone® P CubX® consists internally of a homogeneous, orthogonal grid pattern, welded to two sheets on the outside, which form the sheet surface. The result is an innovative construction sheet with very high longitudinal and transversal stiffness. So rectangular tanks need significantly fewer steel reinforcements, if any, depending on the size of the tank. The sheet is also suitable for permanent contact with a large number of different chemicals, thanks to the proven chemical resistance of Polystone® P (PP). Röchling materials have already been used worldwide for decades for the construction of chemical tanks and plants.

A new standard for rectangular tanks

Röchling collaborated closely with tank builders for the development of Polystone® P CubX® and made full use of their experience. Thomas Schürer, Marketing & Development, was significantly involved in its development. He explains, "We have already been producing solid plastic sheets made of thermoplastics for over 50 years. Reinforcements are necessary, however, as a result of the low bending strength of the sheets. We wanted to develop an entirely new sheet with which rectangular tanks can be constructed considerably faster. We are convinced that with its many advantages, Polystone® P CubX® will become established in the long term as the standard for rectangular tanks."

Application areas

Polystone® P CubX® is particularly suitable, for example, for galvanising plants, steel pickling plants, sewage technology, cleaning systems, purification systems and for tank fittings. Other applications include lids and partitions for round tanks, enclosures for ventilation systems and retrofits and repairs for rectangular tanks. Great potential is also seen in areas outside the chemical industry, such as flood retention, fish breeding tanks and swimming pool technology.

By cable car to work



© Doppelmayr Seilbahnen GmbH

Way to work with a great view:
Urban cable car system in La Paz

Röchling plastic gets people in Bolivia safely to their destination

The Teleférico in La Paz is the world's longest and densest urban cable car system. Up to 300,000 passengers use it every day. For many it is the means of transport they use to get to work. Slide rails made of Robalon® by Röchling ensure that the gondolas of the Teleférico are guided into the stations efficiently and reliably.

The cableway gondolas float slowly over the roofs and streets of La Paz. Far below the gondolas there is the usual chaos of a big city: cars and minibuses stand in queues in the narrow streets, traders make their way through the congestion to sell their goods. The Teleférico connects La Paz, a vibrant city of millions, to El Alto higher up and takes some of the pressure off the overcrowded streets.

World's largest urban cable car system

People get on and get off at 36 stations. To enable them to do so, the gondolas are slowed down by means of a guide system. In this guide system slide rails made of Robalon® by Röchling ensure efficient, safe operation. The slide rails are machined in Austria from Röchling Leripa Papertech according to the customer's drawing. With its outstanding sliding properties and high wear resistance this material contributes to a smooth operation and offers a long service life. Thanks to its high UV and weather resistance it is well suited to continuous operation outside under the South American sun.

The Teleférico is a real benefit to people. The journey from La Paz to El Alto takes only a few minutes. By bus or car it normally takes an hour or more. La Paz lies 400 metres further down, at 3,600 metres, so a cable car system was the right way to overcome the altitude difference. This unusual way of getting to work saves people a lot of time.





In focus: Corporate R&D

Dr. Axel Höfter has been General Manager Corporate R&D since 1 April 2018. In the interview he talks about the tasks of Corporate R&D, what will change in the development of innovations at Röchling Industrial, the role that megatrends play and why some companies will disappear from the market in the future.

“We shouldn’t carry out our research in an ivory tower.”

Röchling Industrial wants to strengthen R&D. You’ve been General Manager of Corporate R&D since 1 April 2018. What does that mean?

Dr. Axel Höfter: Corporate R&D is the central development department that pools and coordinates all R&D activities across all locations and Business Units; it aims to increase efficiency and collects, defines and tracks overarching development topics.

How did development and innovation happen at Röchling Industrial previously?

All industrial sites, but especially those that were acquired, essentially have their own R&D department. This is also strategically intended to preserve the independence and great flexibility of the decentralised units, as they have the best knowledge of their customers, products and markets.

What is set to change, then?

The Röchling Industrial division now has more than 40 locations. This means that activities have to be coordinated between the locations – if only to avoid redundant development activities. It is also a matter of recording

existing know-how and making it accessible to the company so that it can be used as sustainably as possible.

Is coordination the only task of Corporate R&D then?

No, that’s only part of its job. Our primary task, of course, is to deal with overarching

development issues. It seems particularly important to me that we get to grips with trend topics and so-called megatrends, such as the growing world population, urbanisation, nutrition, etc., derive strategically relevant topics for Röchling Industrial from them and find applications for existing or new materials and product ideas. When it comes to new trends and developments in the industries relevant to us, such as additive manufacturing (3D printing)

”

It’s a matter of recording existing know-how and making it accessible to the company so that it can be used as sustainably as possible.

or lightweight construction, sensor integration or Industry 4.0, we must comprehend these topics in a structured manner and derive innovative ideas from them using modern methods. In addition, as an interface with those responsible for development and innovation in the other Röchling Group divisions – those being Automotive and Medical – we want to improve cooperation and exploit synergies.

Innovation has always been a top priority for Röchling Industrial. How has innovation happened so far and what do you think needs to change?

We've always had a very high level of customer focus; this has also distinguished Röchling Industrial as an innovation driver in the industries. Our aim has always been to meet our customers at eye level, to understand their applications in detail and to further improve them with our materials expertise. This means that we have adapted existing materials to the customer's requirements or recommended or developed new materials. In today's fast-moving world with ever shorter product life cycles, this is no longer sufficient when it comes to offering our customers a real competitive advantage and to living up to our own claim regarding technological leadership.



We now want to go further and develop from a component manufacturer to a strategic partner for completely ready-to-install systems.

What does that mean in concrete terms?

We used to see ourselves as a supplier of semi-finished products and machined parts made of technical plastics. We now want to go further and develop from a component manufacturer into a strategic partner for completely ready-to-install systems. This is the only way we can make our

plastics smart and give them new functions. They can, for example, report their wear condition or operating temperatures or provide digital data to simplify logistical processes for customers.

Röchling is building a new Industrial Center in Haren, where R&D activities will be located. What will the department look like then?

Of course, R&D activities are very closely interlinked with parts of quality control, i.e. quality assurance and materials testing. Therefore, these departments will also be relocated to the new building; the spatial proximity will increase technological permeability. Four engineers and technicians have so far been combined in the R&D Department. We're also currently looking for a designer for 3D printing and will need additional specialists from various disciplines in the future to be able to successfully continue on our chosen

”

Companies that do not follow this path will disappear from the market in the foreseeable future.

path. We shouldn't, however, carry out our research in an ivory tower; we need close contact with our customers in the markets. To this end, we maintain

regular and close exchange with our industry managers, who are experts in the target industries and know about the questions of our customers and the trends. They bring us closer to our customers on the ground to help us improve our understanding of their needs and applications, from which derive ideas for innovations.

Why is innovation so important for Röchling Industrial?

It is only when we are innovative and offer added value to our customers that we can succeed long-term in volatile and competitive markets. Companies that do not follow this path will disappear from the market in the foreseeable future or will only sell standard products at the lowest prices and margins as commodity manufacturers. We at Röchling, on the other hand, want to be innovation partners for our customers.



Under construction: The Industrial Center in Haren is set to be completed in autumn 2020; it will be home to large and representative conference rooms and new office rooms, and Corporate R&D will also have its home there

Employees

Röchling Industrial – we have **3,687** employees at **42** locations worldwide. Plastics are the materials of the 21st century. For all employees, Röchling Industrial's international activities open up an interesting area of responsibility for their daily work and exceptional career prospects.



International

As a globally active company with sites on the European, American and Asian continents, our employees work in an international environment with responsible and varied tasks.

Flat hierarchies

Röchling Industrial has flat hierarchies and offers the opportunity to assume responsibility quickly. Traditionally, we invest in our employees and fill specialist and management positions as far as possible from within our own ranks. Many of today's managers began with us as trainees.

Further training

The Röchling Group seminar programme is available to our employees for professional and personal development. The further training measures are discussed individually between employees and their direct superiors and agreed as required. We promote the development of junior staff in a variety of ways.

Training

The importance of qualified employees is also reflected in our training. From plant operators to cutters, we employ numerous trainees in at least 20 training occupations at several Röchling locations in Germany and Austria. Training "at eye level" and the opportunity to take on responsibility at an early stage are the hallmarks of the training. Qualified and experienced trainers support our trainees in all phases of their training. Every day the trainees receive first-hand practical knowledge, getting them into great shape for their daily work.

Students

We also offer students the opportunity to perform tasks independently and under their own responsibility. More than 50 young people a year experience the exciting world of work at Röchling as part of internships or apply the knowledge they have learnt to "real" operational challenges as part of their final theses.

Active together

With team spirit, as well as a lot of dedication and fun, our employees compete together at numerous sporting events. Whether it be city races, soccer tournaments or cycling events: you always get the opportunity to meet your colleagues outside your own site and department.

Information on current vacancies can be found at jobs.roechling.com



Facts & figures

10,929

employees

90

locations

25

countries

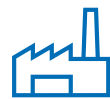
2,140

annual sales of million euros

Our 10,929 employees work where our customers are – at 90 locations in 25 countries. Together the three divisions Industrial, Automotive and Medical generate an annual turnover of 2,140 million euros.

The Röchling Group

The Röchling Group has been shaping industry. Worldwide. For nearly 200 years. We transform the lives of people every day with our customised plastics: they reduce the weight of cars, make medication packaging more secure and improve industrial applications.



The **Industrial** division is the expert for optimal materials for every use. We develop and supply individual products made of plastic for all industrial areas. This is why we have the broadest product range of thermoplastics and composite materials. We supply our customers with semi-finished products or machined components.

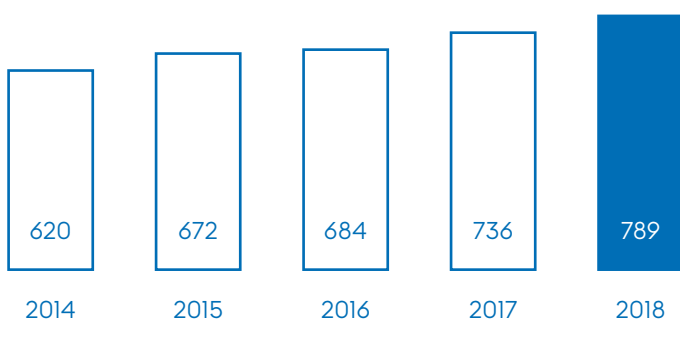


The **Automotive** division advances mobility. Our system solutions in the areas of aerodynamics, propulsion and new mobility help solve major challenges. We protect the environment while also improving the driving experience.

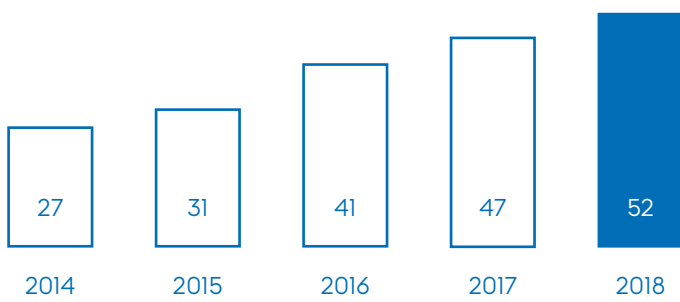


The **Medical** division is the reliable partner to leading global companies when it comes to the components, services and smart plastic products that are needed in the healthcare industry. We develop solutions in the fields of diagnostics, fluid management, pharma as well as surgery and interventional.

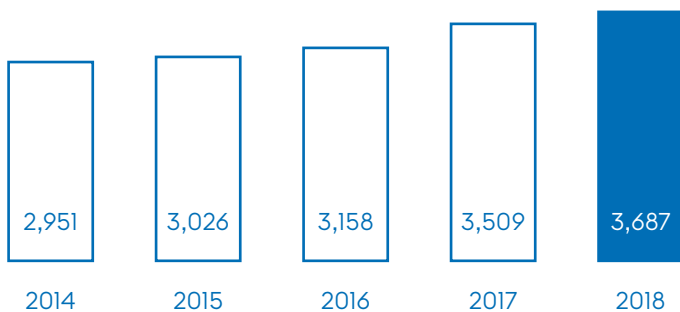
Röchling Industrial



Development of sales
Consolidated (€ million)



Development of investments
in fixed assets (€ million)



Development of employees
Number of employees



3,687

employees



789

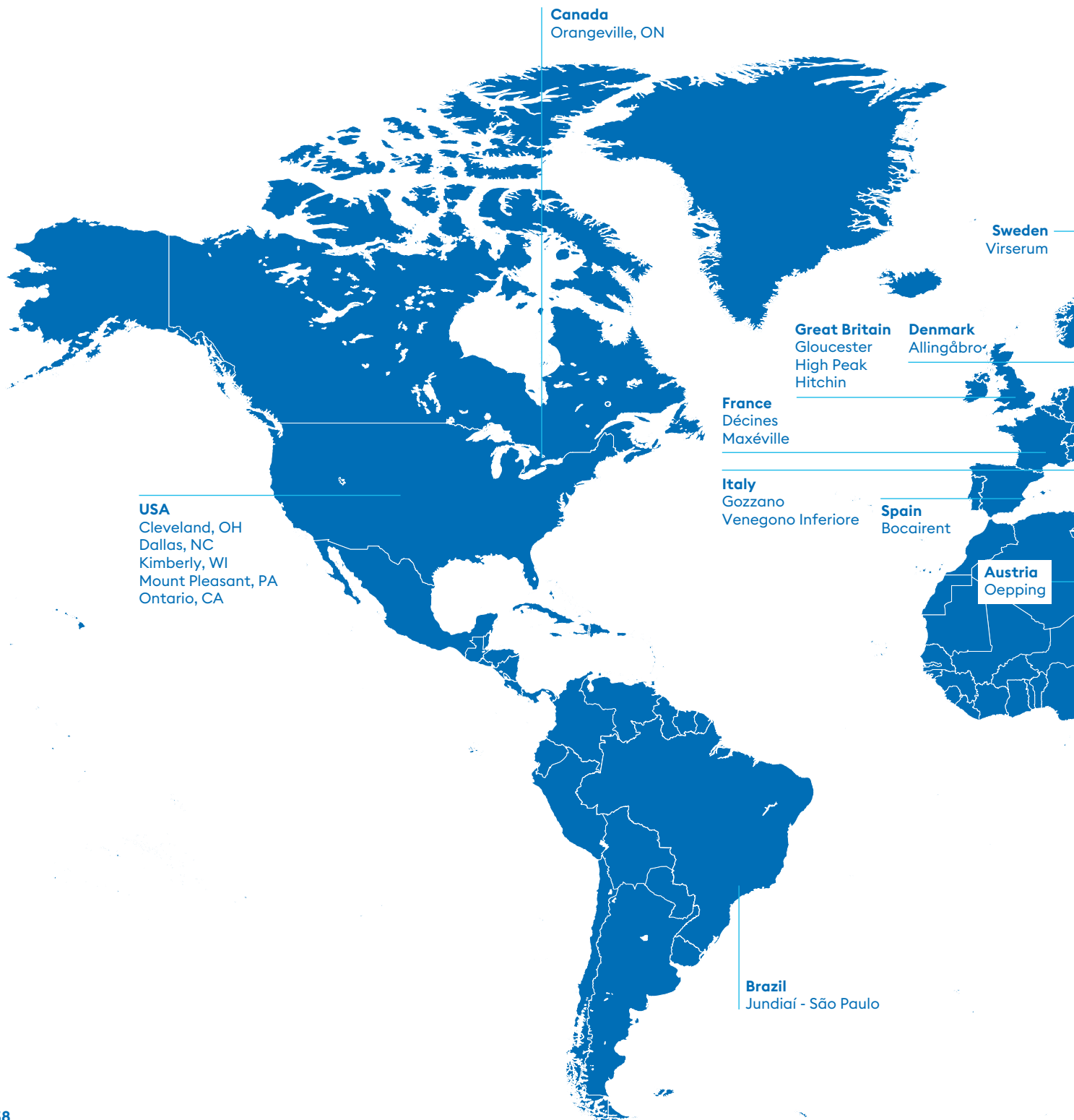
sales of million euros



42

locations

Global presence – Röchling Industrial



Germany
Arnstadt
Bad Grönenbach-Thal
Haren
Lahnstein
Laupheim
Lützen
Nentershausen
Roding
Ruppertsweiler
Troisdorf
Xanten

Finland
Rusko
Russia
Saint Petersburg

Latvia
Liepāja

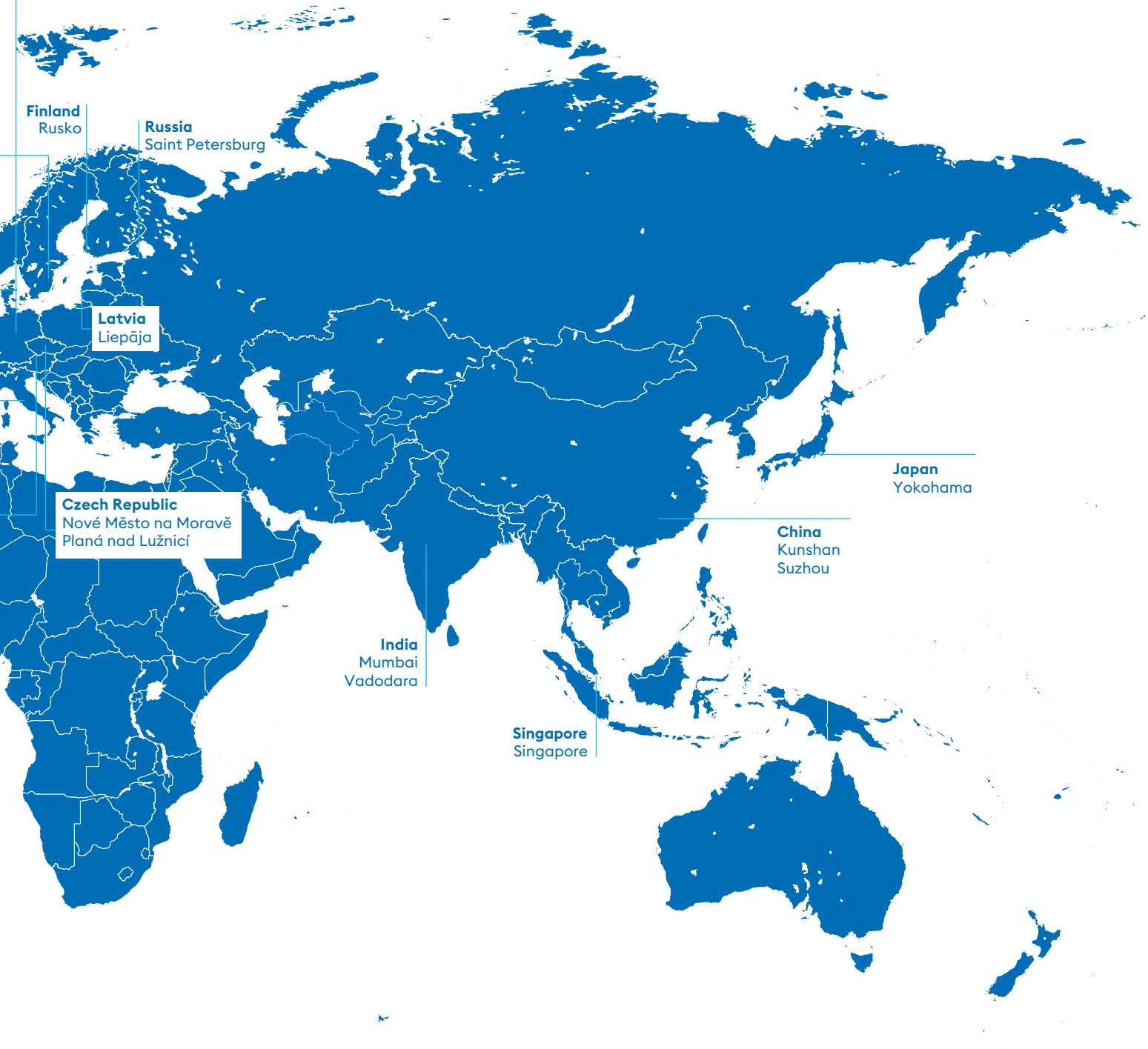
Czech Republic
Nové Město na Moravě
Planá nad Lužnicí

India
Mumbai
Vadodara

Singapore
Singapore

China
Kunshan
Suzhou

Japan
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Comprises more than 230,000 square metres:
the Haren site

Haren site

Key figures

- Around **780** employees
- Over **50** trainees in **13** different professions
- Certified as a **“TOP Training Company”** by the IHK (Chamber of Industry and Commerce) Osnabrück-Emsland-Grafschaft Bentheim

Röchling Industrial's parent company

Our site, Röchling Engineering Plastics SE & Co. KG in Haren, Germany is the parent company of the Industrial division. It makes a major contribution to Röchling Industrial's process and innovation expertise. At the site, we produce thermoplastics and composite plastic sheets, profiles and round rods. We also machine parts based on technical drawings from our customers. Our products are used in almost all sectors of the capital goods industry.

Employees and training

The site's 780 employees decisively shape its extensive know-how. This potential is based, among other things, on a very low turnover rate and great solidarity among the workforce and families. Many parents work at the company together with their children across generations. At the annual anniversary celebrations, many employees are regularly honoured for their 25 and even 40 years of service to the company – some have even been with the company for 50 years. Our traineeships are every bit as diverse and multifaceted as our products and their applications. At the Haren site, we train more than 50 apprentices in 13 different occupations and dual courses of study. At the beginning of 2019,

the IHK (Chamber of Industry and Commerce) Osnabrück-Emsland-Grafschaft Bentheim confirmed the excellent training quality at the Haren site with the “TOP Training Company” certificate. Training “at eye level” and the opportunity to take on responsibility at an early stage are the hallmarks of the training at Röchling.

State-of-the-art:
new press for the
production of
Lignostone® sheets



Focus on quality:
pressed sheets made
of the branded
material Polystone®
produced in Haren



Block made from
Lignostone®:
only selected red
beech veneers
of the highest
quality are used
for production

Profile: machined according to customer
drawings on the modern CNC machines at
the Haren site

Lahnstein site

Key figures

- Around **320** employees
- More than **20** trainees in **6** different professions
- Total investment since 2010: over **40** million euros

Centre of excellence for high-performance plastics

In the Industrial division, Röchling Sustaplast SE & Co KG in Lahnstein is our centre of excellence for high-performance plastics; these are materials that are used in technical applications at continuous operating temperatures of up to 250 °C. The Röchling Sustaplast products are used in virtually all capital goods industry sectors: important target industries include railway technology, oil & gas, electronics, foods, renewable energies and aviation.

More than 320 employees

This process and innovation expertise is based above all on the extensive know-how and commitment of the more than 320 employees. This is mainly due to the very low turnover rate and the high level of loyalty to the company. At the annual anniversary celebrations, many employees are regularly honoured for their 25 and even 40 years of service to the company.

Regularly top of the class

Moreover, the importance of qualified employees is reflected in the over 20 apprentices, who are receiving training in six professions. Our trainees at the Lahnstein site regularly graduate with top marks. Training young people is an important contribution to safeguarding the company and its competitiveness. The number of employees taken on after training at Röchling Sustaplast is

Centre of excellence for high-performance plastics: the Lahnstein site



Thickness control:
sheet manufactured
in Lahnstein from
the world-renowned
high-performance
plastic
SUSTAPEEK



Moulded part made of SUSTAMID:
Röchling Sustaplast has one of the
most modern and largest facilities
for processing cast polyamide



Enabling fast availability of goods:
the logistics centre in Lahnstein

very high. Many of today's employees in Lahnstein completed their training at the site. Some of them are now in leading positions within the international group of companies.

Investments strengthen competitiveness

The site's importance is also reflected in the investments made in recent years. Since 2010, Röchling has invested more than 40 million euros in Röchling Sustaplast SE & Co KG, Lahnstein, which has strengthened the site and its competitiveness. Examples include the expansion of the production hall by 3,000 square metres and the expansion of the existing logistics centre by 900 square metres of shipping area and 3,000 square metres of hall space. These expansions more than doubled the capacity there.

The modern machine fleet was also expanded: for example, a new calendering facility to produce sheets from thermoplastics was put into operation. This facility produces the high-temperature material SUSTAPEEK in sheet thicknesses of 1 - 8 mm, which is unique in the world.

Imprint

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