

Röchling



Just Courage

Röchling Group
2018/2019







Dear Sir or Madam:

The future waits for no one. It is our job to shape it responsibly. This applies in particular to a traditional family company like Röchling. We have already demonstrated courage in the face of change many times in the past. This courage is in the Röchling DNA and is a key to our continuing success.

In this day and age, when markets, competitors, and technologies are changing so rapidly against the backdrop of the digital transformation, we need to be bold when making decisions – without knowing in advance what the answer will be and without fear of failure. If we want innovations, we need to take risks. And those who take risks, may also make mistakes. This is where Röchling uses an intelligent risk management system to determine which mistakes are critical and need to be prevented at all costs and which offer opportunities and could even be beneficial to the company – because they help us to learn, to further develop, to grow, or to gain new perspectives.

A positive error culture is therefore an important part of our corporate culture. We see it as our job to create an environment in which change and innovation can thrive. An environment that is characterized by mutual trust, respect, and tolerance. In which employees have the confidence to voice their opinions and are bold enough to be creative – even if that means falling flat on their face. An environment that rewards those who have unconventional ideas and swim against the current – not those who prefer to just stick to the status quo. In which the focus is on the opportunities that present themselves – and not on the risks that could cause us to fail. An environment that encourages lifelong learning and constant optimization. And in which employees feel secure.

This safe environment has nothing to do with everyone staying within their comfort zone. Comfort zones represent routine and tried-and-tested methods, where there is no need to think outside the box and where we can work, think, and live on autopilot without questioning our opinions or processes. This doesn't require a lot of effort. When someone comes and says: "We are setting out for new shores now", courage and determination are required. This is because a new direction often means changing requirements and learning something new. There are people who venture into this new territory boldly and with curiosity, and others are understandably uncertain.

This is another task for the management team to handle: communicating the meaning and purpose of the transition and change to their employees. We want to give our employees credible prospects and direction for the future. We take every opportunity to listen to our employees, to find out their concerns, and to reassess the situation from

their point of view. It is also important to us that our employees actively get involved in new developments. This is the only way that our company will be able to prepare itself for the future and succeed in the long run.

We know that the digital transformation and the rate of change are bringing with them unique requirements. Of course, this affects the management team as well as each individual employee. We, the members of the Executive Board, require a great deal of courage during these times too. Courage to pave a new way for the company if we believe success will come from change. Courage to keep what already works, even if the spirit of the times demands precisely the opposite. Courage to look at things from a completely different angle. There is no guarantee that we will make the right decision. But one thing is certain: a lack of courage will only result in us missing opportunities and in the worst case, finding ourselves going down the entirely wrong path.

What inspires us to be daring is our firm belief in our ideas and success. For our 2018/2019 corporate brochure, we have compiled topics and projects that demonstrate the need for openness towards innovation, courage, and passion all over the world of Röchling – from our customers, our suppliers, our partners, us as a company, and our employees. It takes courage to let go of the past and look towards the future. We think we are on the right track here at Röchling.

In the future, Evelyn Thome will accompany us on this track in assuming a decisive position. She took up the position of Chief Financial Officer on the Management Board of the Röchling Group in May 2019. She is responsible for finance and controlling at Röchling. Evelyn Thome has been highly dedicated to our company for almost 20 years now and her previous role was as the CFO of the Röchling Automotive Group. We are delighted to have her on board as we shape the bold and successful future of Röchling together.

We look forward to your continuing loyalty, and we hope you enjoy reading the interesting and exciting articles in this edition.



Prof. Hanns-Peter Knaebel
President & CEO



Erwin Doll
Vice-Chairman



Franz Lübbers
Executive Board

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Fearless in the Face of the Unknown

“I see decisiveness as a very

An interview with Röchling
CEO Prof. Hanns-Peter Knaebel
about false impressions of
security, the risk of hesitation,
and the perfect combination
of courageous and cautious
employees



positive quality”



Professor Knaebel, do you see yourself as a courageous person or are you more cautious?

I generally think of courage as an attribute that you accredit to other people, not to yourself. But since you ask, I wouldn't say that I'm an anxious person, nor am I overly cautious. I weigh up opportunities and risks thoroughly against one another. I don't fear failure, so I suppose that can be defined as "courage."

Does that only apply to your personal life or to your working life too?

It is hard for me to imagine acting any differently in my working life than I do in private. I think that I am just as responsible and decisive in my profession as I am at home. For example, I don't see how a person could be excessively cautious and reserved when it comes to their personal finances but then be bold and risk-oriented when it comes to company funds. If you have a functioning value compass in your private life, then it will most likely operate effectively in your professional life too.

How important are courage and a willingness to take risks for the development of a company?

To me, the word "courage" implies that you have weighed up the facts. So I see courage as a positive thing. However, a willingness to take risks suggests to me a daring attitude associated with a willingness to raise the stakes. And that is not necessarily an indicator of a balanced approach. In both our professional and private lives, we are always functioning within a certain level of uncertainty. The question is how much uncertainty is tolerable when it comes to making decisions. In my opinion, we try all too often to use a plethora of information to lull ourselves into a false sense of security, which does not and cannot really exist. I therefore call for a thorough but unshrinking analysis of information to make important company decisions quickly. I see decisiveness as a very important and positive quality. However, it should always be paired with critical self-reflection.

Does a bold and decisive management team generally have greater success than a more cautious and hesitant one?

The most important criterion for any company is that sound and pioneering decisions are made promptly based on the information available. If a person is willing to reflect on their decisions, it may be possible to correct or "fix" decisions that prove to be sub-optimal in retrospect. The worst thing for an organization, whether that is a company, a family, or a sports club, is when people are still hesitant after assessing risks and opportunities and fail to make a decision at all. This would make any organization come to a standstill and standstills are the start of the downfall of any successful enterprise.

How do you find the right balance between courage and a sense of responsibility?

Finding the balance between courage and a sense of responsibility isn't something you can learn from a textbook, it takes constant practice. The former editor of *Fortune Magazine* Geoffrey Colvin once said: "Talent is overrated." What he meant was that talent alone is not enough for certain tasks. You also need a disposition that has been refined and developed through continuous practice. A good gut instinct predominantly based on experience is essential when it comes to making balanced decisions. Experience isn't necessarily measured in years here. When you are already taking responsibility and making lots of decisions and when you are also ready to reflect on the result of these decisions and rectify them if necessary, this is when you gain an unconscious sense of how to behave in certain situations or how to make decisions.

Is there a necessity for more courage now in this age of digital transformation? Or does a company actually always need to muster this level of courage in order to build a sustainable future?

Any form of transformation requires courage: courage from those who are initiating the change, and also courage from those who implement and undergo the change. Those who support the company also



“I wouldn’t say I am overly cautious. I weigh up opportunities and risks thoroughly against one another.”
 Röchling CEO Knaebel prepares himself for his first paragliding trip.

need courage, like the shareholders. If a company seems to be doing well and yet fundamental changes are being introduced, there is often a question of whether all shareholders will be able to understand and support this change. This is when you need to start clarifying the situation. If you do not explain the external circumstances and the changes that result from them and do not take people on this journey with you, the transition will not be successful. It’s not just a question of courage. You also need to be persuasive and present the right arguments. The digital transformation is a very good example here because many aspects of digitalization still seem like gimmicks or just “nice-to-have.” But being hesitant when it comes to these issues will be detrimental or even destructive to companies in the near future.

Does it also take courage to stick by traditions, values and tried-and-tested methods?

The philosopher Odo Marquard once said: “The future needs the past.” I find this sentence particularly incisive as it really hits the nail on the head with regard to the important relationship between origin and change. Those who try to change a company in a way that contradicts the very DNA of the organization or try to take away the company’s identity or even its soul, will fail. An awareness of the past, tradition, and values is extremely important when it comes to ensuring future success by making changes. Our value compass should be securely anchored in the organization because values such as trust, respect, appreciation, commitment, or creativity are not only values that were useful in the past, they will also be useful in the future.



In what areas could Röchling afford to be more daring in your opinion and why?

Röchling is a daring company! It has proven its openness towards transformation multiple times over the course of its history. It should be our aim to become more aware of changes, to proactively shape the future, and to not wait until the circumstances leave us with no other choice. This doesn't mean that Röchling should just respond to things it encounters on its journey, quite the opposite. However, inertia is always at its greatest when people are in their comfort zone, in other words, when things are going well. And things are going well at Röchling. This is precisely when we need courage the most to continue to challenge ourselves and to review existing structures. This applies to every organization, Röchling included.

What attitude do you want the company to take?

Our company is characterized by passion and identification with or loyalty to Röchling. I want to make sure we keep hold of this in the future. But I would also like to see creativity, openness, and a climate in which everyone can speak about anything with anyone in the company. For me personally, no topics are off limits, but the dialog always needs to be respectful and considerate. When we start policing people's thoughts, we are drastically restricting our opportunities for the future. This would be a shame because I would like to keep the Röchling Group open to lots of different courses of action, while always keeping in mind the DNA of the company.

Is it only employees who take risks who are courageous? Or are those who, for example, demonstrate their willingness to change through continuous learning also courageous?

Every employee demonstrates courage, but it will come out in different ways. A company that is as diverse as ours needs people who are always thinking outside the box and daring to try something new. At the same time, it needs employees who provide a safety net for their risk-oriented counterparts and are spirited enough to stay dedicated to day-to-day operations. This kind of support is essential to a

company. Those who are new to the company and want to set new things in motion also demonstrate courage. Those who have been working with us for decades and have reinvented themselves many times within the company are equally brave. Therefore, courage shows itself in many different ways. However, one thing seems to be relatively clear: Employees who lack the willingness to continuously learn and develop probably aren't bold enough to make themselves fit for the future. I haven't experienced this at Röchling, but I think it is a problem in general.

Is a daring employee more valuable to a company than a more cautious one? Because that employee is driving the company forward?

I don't see these qualities as in competition with one another. Cautious is just a word to describe someone who needs more information and time before they can make a decision. Decisions have to be made at some point. Cautious employees can be excellent sparring partners for the more daring employees in the company and challenge their standpoints. This is why we need both daring and cautious people at Röchling.

How does Röchling encourage its employees to be daring? How do you establish a corporate culture that promotes experimentation and creativity? And an environment in which people feel confident enough to question and refute things?

Trust is one of the central values of my management philosophy. Everyone is given my trust, they don't have to earn it. A well-functioning culture of trust is the foundation for individual development and creativity. Those who feel trusted are free to experiment and discuss ideas discerningly. Of course, trust can be squandered, and the management team needs to respond to this. However, I don't think that you should have to work tirelessly for a number of years to gain trust. This is a frustrating and laborious process that teaches people to fear failure instead of fostering courage and creativity. I can now look back on half a century of life experience and on several decades of professional experience. I've put my trust in everyone I have encountered along the way, and so far I have rarely been disappointed. We are all able to perform at our best when we trust each other.



“We are all able to perform at our best when we trust each other.” The two tandem paragliders have their destination in sight.

The Röchling Group 2018

The Röchling Group, which is headquartered in Mannheim, comprises 91 locations in 25 countries all over the world. With a workforce of 10,929 employees (31 December 2018), we manufacture our products in close proximity to our customers and markets.

Our three company divisions, Industrial, Automotive, and Medical, generated total sales of 2,140 million euros on the European, American, and Asian continents in 2018.



2018 2,140

2017 1,841

2016 1,657

2015 1,555

2014 1,364

EBITDA
in million euros

214

228

212

209

164

**SHAREHOLDERS'
EQUITY**
in percent

38.5

42.2

44.0

42.0

41.9

EMPLOYEES
as of 31 December

10,929

9,733

8,800

8,400

7,880

A global presence: 91 locations in 25 countries



Canada
Orangeville, ON

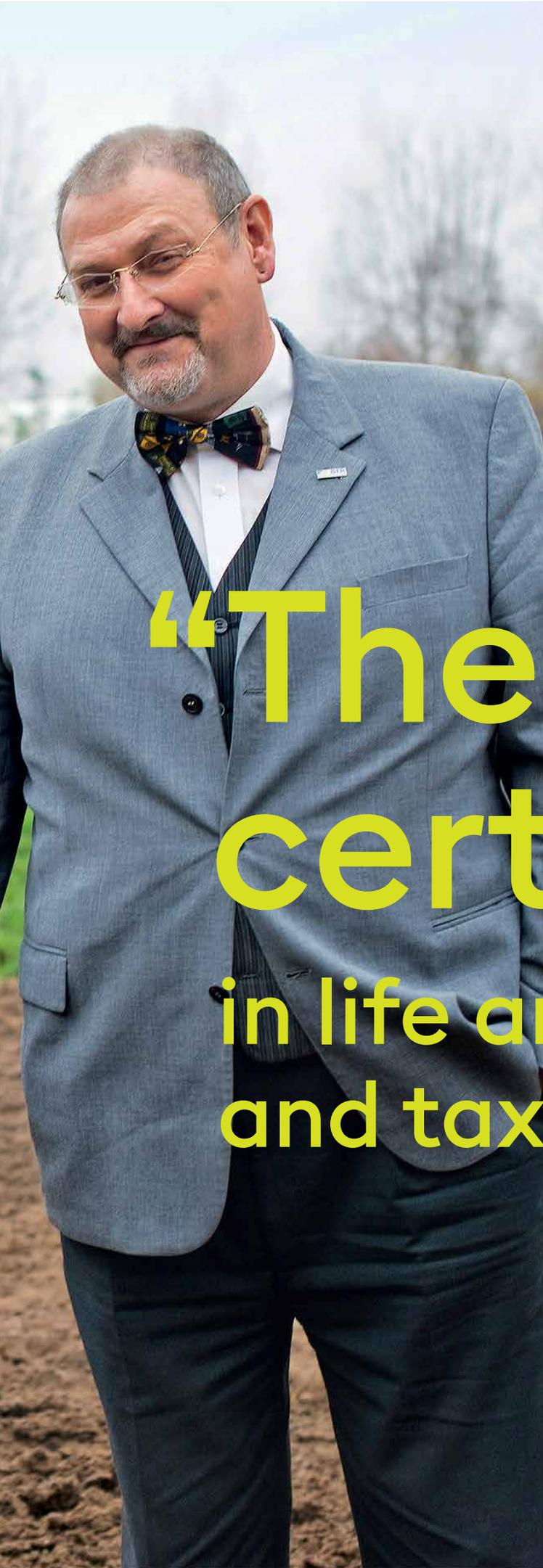
USA
Akron, OH
Cleveland, OH
Dallas, NC
Denver, PA
Duncan, SC
Kimberly, WI
Mount Pleasant, PA
Ontario, CA
Rochester, NY
San José, CA
Troy, MI

Mexico
Silao

Brazil
Itupeva
Jundiaí







“The only certainties in life are death and taxes”

Prof. Andreas Hensel, President of the German Federal Institute for Risk Assessment, on perceived and actual risk, consumer fears about contaminated food, and the meaningfulness of tattoos

Professor Hensel, you are an expert when it comes to risk. What do your studies show – what risks are people most concerned about?

The studies paint an interesting picture. We have a social science department at the German Federal Institute for Risk Assessment, which conducts a lot of research into how risks are perceived in the general population. This research shows that many citizens have quite a realistic perception. Smoking, drinking alcohol, and unhealthy or disordered eating regularly come up as three major health risks in the five most mentioned risks.

Well, this is a very positive result, don't you think?

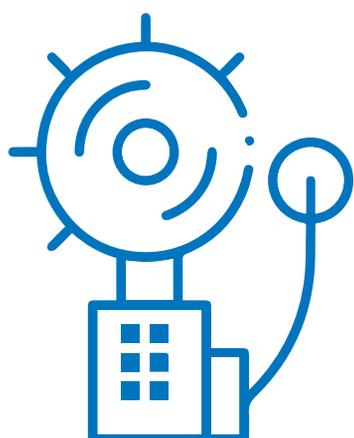
Yes, but when we ask people to assess the risk of specific health and consumer issues, the results are very different. Comparatively low risks then appear right at the top of the rankings, for example “residual pesticides in food,” “microplastics in food,” and “genetically modified food.” On the other hand, important issues such as “food hygiene at home” or “Campylobacter in food” – now the most common germ in foodborne infections – weren't causes of any great concern. Let's put it this way: People are aware of the greatest risks to health, but there is a huge gap between the assessments of experts and laypeople on a wide range of health and consumer issues.

How do people actually perform a risk assessment? What needs to be taken into account?

The general public generally consider a risk to be less significant if it is something that you administer yourself or something you can opt out of. Someone who smokes or drinks does it of their own volition. This doesn't mean that you don't know about the dangers. But it is just seen as a personal problem. It is a completely different story when the risk is perceived as being unavoidable. Dioxin in eggs, glyphosate in beer, microplastics in water – this is what makes the consumer's soul revolt. The idea that you are being poisoned essentially awakens our primal instincts. A lot of people react to such reports with suspicion and aggression, which is completely understandable. It is not surprising that conspiracy theories and messages of hate surround topics like these.

How objective is this assessment?

Objectivity is not a benchmark for this topic. Evolution has equipped humans with a special sensorium to protect them against dangers. In the modern world, this warning system malfunctions all too easily. The fear of poisoned or contaminated food was well founded in the past. These days, when the quality of our diets is better than ever, this mistrust is just as –



“Our internal alarm bells don't start ringing every time we shovel too many goose legs, fries, or cream pies into our mouths.”



How safe is our food and animal feed? This is the issue that veterinarian, microbiologist, and hygienist Prof. Andreas Hensel, President of the German Federal Institute for Risk Assessment, is addressing.



“People who get tattoos have what they consider good reasons to do so. Maybe they want to impress someone and are willing to accept being pricked with a tattoo needle and dyeing their lymph nodes to achieve this.”

or even more – widespread as ever but usually without reason. In contrast to this, our internal alarm bells don't start ringing every time we shovel too many goose legs, fries, or cream pies into our mouths. An unbalanced and rich diet can make you ill, but this wasn't an issue in the Stone Age – back then every calorie was welcome and certainly wasn't cause for any panic.

So should we rely on our personal instincts or hard facts, for example when trying to decide whether tattoos or glyphosate pose a greater risk to our health?

Decisions like these are not just based on calculated risks. People who get tattoos have what they consider good reasons to do so. Maybe they want to impress someone and are willing to accept being pricked with a tattoo needle and dyeing their lymph nodes to achieve this. This probably seems like a relatively small price to pay if you are able to win over your love interest with a bold tattoo. Tattooing may be ill-advised from a medical point of view, but it can ultimately serve a purpose. On the other hand, those who are worried about chemicals will probably opt for organic carrots or grapes due to their fear of glyphosate. However, you will consume just as much

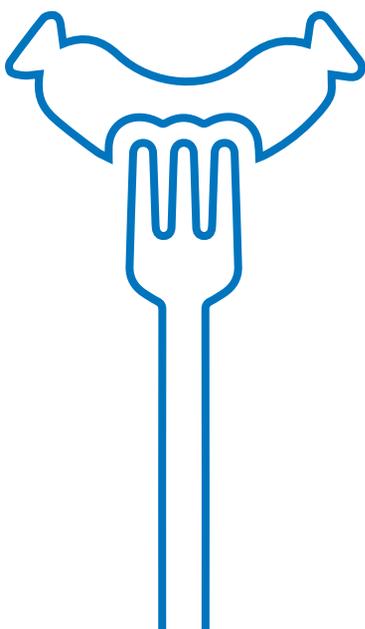
pesticide in these products, even though it hasn't been synthetically produced. The benefit of this is therefore highly questionable.

Is risk awareness something we can learn?

Our modern lifestyle is a challenge. Whether it relates to medical treatment, a healthy diet, investments, or the weather forecast – we need to consider uncertainties and weigh up risks and benefits in countless areas of our lives. That's why risk awareness is so important. It helps us to make the right decisions. It is essential that our education system teaches at least the basics of risk assessment to give our natural intuition the boost it needs.

When do people feel particularly unsafe?

As I already mentioned, when a risk appears to be unavoidable – for example, a danger lurking in our food, in the water, or in the air. The second factor is a high level of uncertainty. If the risk seems vague, our imagination runs wild. Do you remember BSE, better known as “mad cow disease”? Scientists initially struggled to define the magnitude of the risk to humans. “Serious” estimates ranged from a handful to tens of thousands of deaths. With such vastly differing predictions, it is hardly surprising that consumers panicked.



“Our modern lifestyle is a challenge. Whether it relates to medical treatment, a healthy diet, investments, or the weather forecast – we need to consider uncertainties and weigh up risks and benefits in countless areas of our lives.”

Is there such a thing as zero risk?

It is a well-known fact that the only certainties in life are death and taxes, and these are hardly things to aspire to. In all other situations in life, we need to negotiate uncertainties and therefore risks to a greater or lesser extent. Consequently, there is no such thing as zero risk. To put it bluntly, the belief in absolute certainty is a risk in itself because it deprives us of countless opportunities. For example, someone who won't leave the house because they are afraid of being hit by a falling brick.

According to your own experience, do most people see a “risk” as a threat or an opportunity?

It is often forgotten that those who take risks generally expect to benefit from them. Those who dare, win! So there is a hidden, extremely positive, and even enticing undertone that resonates here. Despite this, risks are usually seen as causes for alarm in our more cautious society.



The Risk Expert

He knows where the real dangers lie: Prof. Andreas Hensel has been President of the German Federal Institute for Risk Assessment (BfR) in Berlin since 2003. The BfR carries out assessments on the safety of food and animal feed, as well as on the safety of chemicals and products, and advises the German government on health issues. Hensel is a veterinarian, microbiologist, and hygienist and spent many years working as a university professor at the universities of Vienna and Leipzig. The 58-year-old is certainly clear on one thing: perceived and actual risks are worlds apart.

Industrial

The Industrial division supplies almost every sector of industry with optimal, application-oriented materials. To achieve this, Röchling has probably the world's biggest product portfolio of thermoplastics and composite materials. The company manufactures a range of semi-finished parts such as sheets, rods, tubes, flat bars, finished castings, and profiles, as well as machined and assembled precision components.





789

million euros in sales

3,687

employees

42

locations



A large construction site in Cadarache, southern France, is where the ITER fusion reactor that will bring the Sun to the Earth is being built.

INDUSTRIAL DIVISION

Very
hot
stuff

ITER, the world's biggest fusion energy project, calls for a pioneering spirit – Röchling is supplying insulation components for a magnetic field

Some shining examples light the way for the international research project ITER: like the sun and stars, a man-made reactor is to test the potential of fusion energy and the role it could play in future. With rather small but essential components for magnetic and electrical insulation, Röchling is playing a part in this highly ambitious experiment.

Inside the sun and stars, the process is as follows: light hydrogen atoms fuse to become heavy helium atoms, and a huge amount of energy is released. This fusion process takes place at extraordinarily high temperatures of up to 250 million degrees Celsius, at which the matter is in the fourth physical state, plasma.

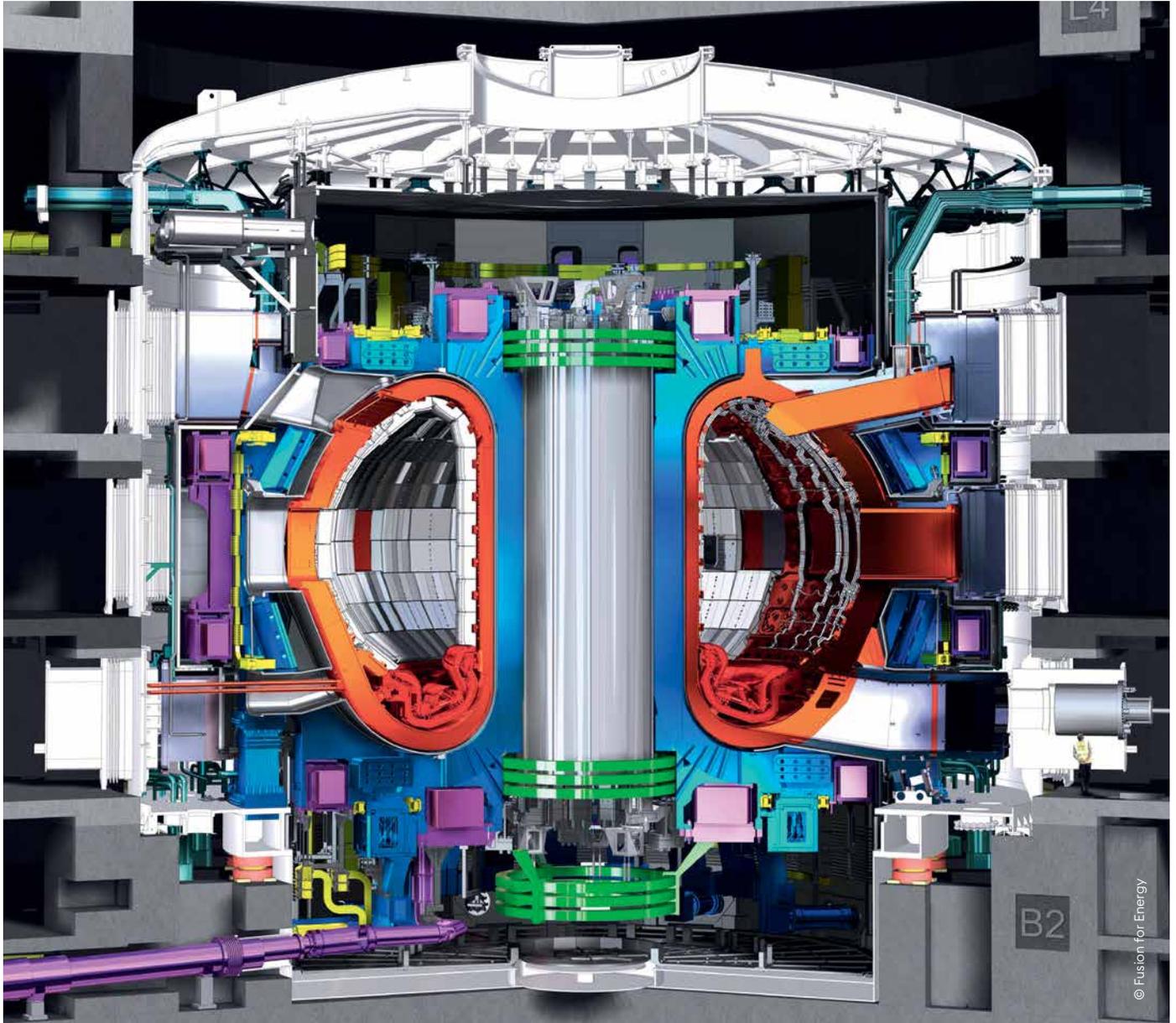
With ITER – the Latin word for „way“ – an international community of scientists has set out to recreate this celestial power plant on earth. It is the biggest international collaboration in the field of energy, bringing together seven Parties representing half of the world’s population and 80 percent of global GDP. They want to produce evidence that it is physically and technically possible to obtain energy through fusion. In Cadarache, southern France, where the

reactor is being built in accordance with the tokamak principle (see explanation), helium is to be created by fusing hydrogen in a vacuum chamber. The extremely high pressures and temperatures needed to do so cannot be generated in conventional vessels. The method of choice is to use “non-material” vessels. This involves magnetic fields outside the vacuum chamber that are so strong that they keep the plasma inside the chamber in the desired form and on the desired orbit.

F4E Manages the European Contribution

The “master of the magnets” is Alessandro Bonito-Oliva, an Italian physicist who has been working on the project since 2008. He and his team from Fusion for Energy (F4E) – the European Union’s organization

How the Tokamak Reactor Works



The tokamak is a type of fusion reactor in which the nuclei of two hydrogen isotopes – deuterium and tritium – are fused in a 15-meter-high vacuum chamber to form helium. Hydrogen exists everywhere in nature in practically boundless quantities: deuterium is found in seawater, while tritium can be obtained from a light metal.

The fusion reaction can take place only when a deuterium and a tritium nucleus come very close to one another. However, as both nuclei are positively charged, they repel one another electrostatically. Successful fusion therefore requires very high kinetic energy that corresponds to temperatures of approximately 100 to 250 million degrees Celsius.

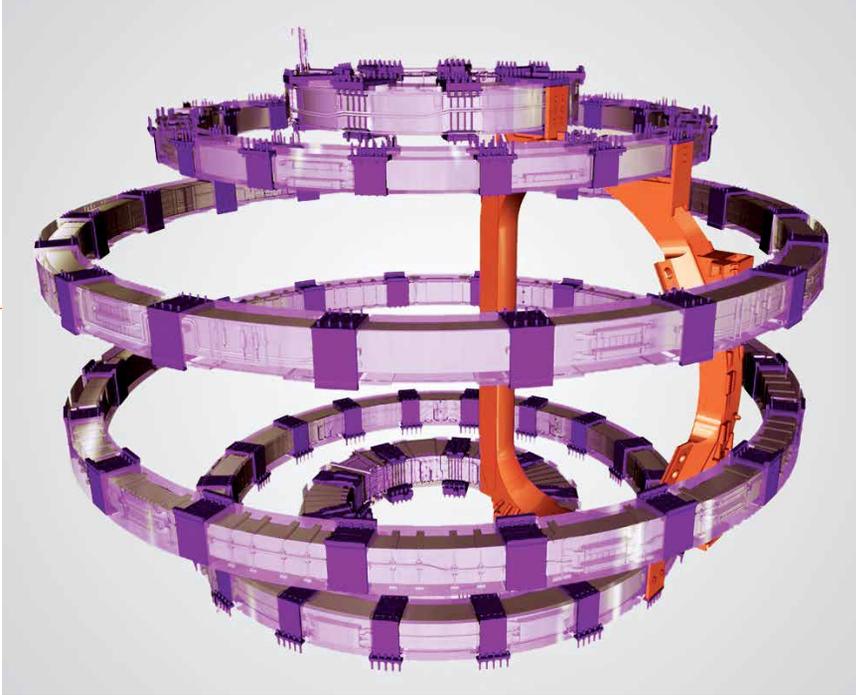
It is only at these temperatures that the nuclei fuse and a plasma is formed. On earth therefore, extreme conditions like those that prevail at the center of the sun have to be created. As no material can withstand such conditions, magnetic fields (in the image above, the coils of the toroidal field are orange, and the coils of the poloidal field are purple) ensure that the plasma is confined and also keep it away from the cold walls of the vacuum chamber. That is important because if the plasma cools, the fusion process ends. The magnetic fields outside the vacuum chamber are so strong that they keep the nuclei, which at high temperatures are very quick and prone to turbulence, in the desired form and on the desired orbit.

Two Strong Fields

The toroidal field consists of 18 coils that weigh 300 tons each and are arranged vertically such

that they resemble the shape of a donut. The donut in Cadarache is 16 meters high

and has a diameter of nine meters. The poloidal magnetic field, which is made up of six ring-shaped, horizontally magnetic coils, then groups itself around it. These coils not only shape the plasma, but also contribute to its stability by keeping it away from the walls of the vacuum chamber, which prevents unwanted cooling of the plasma.



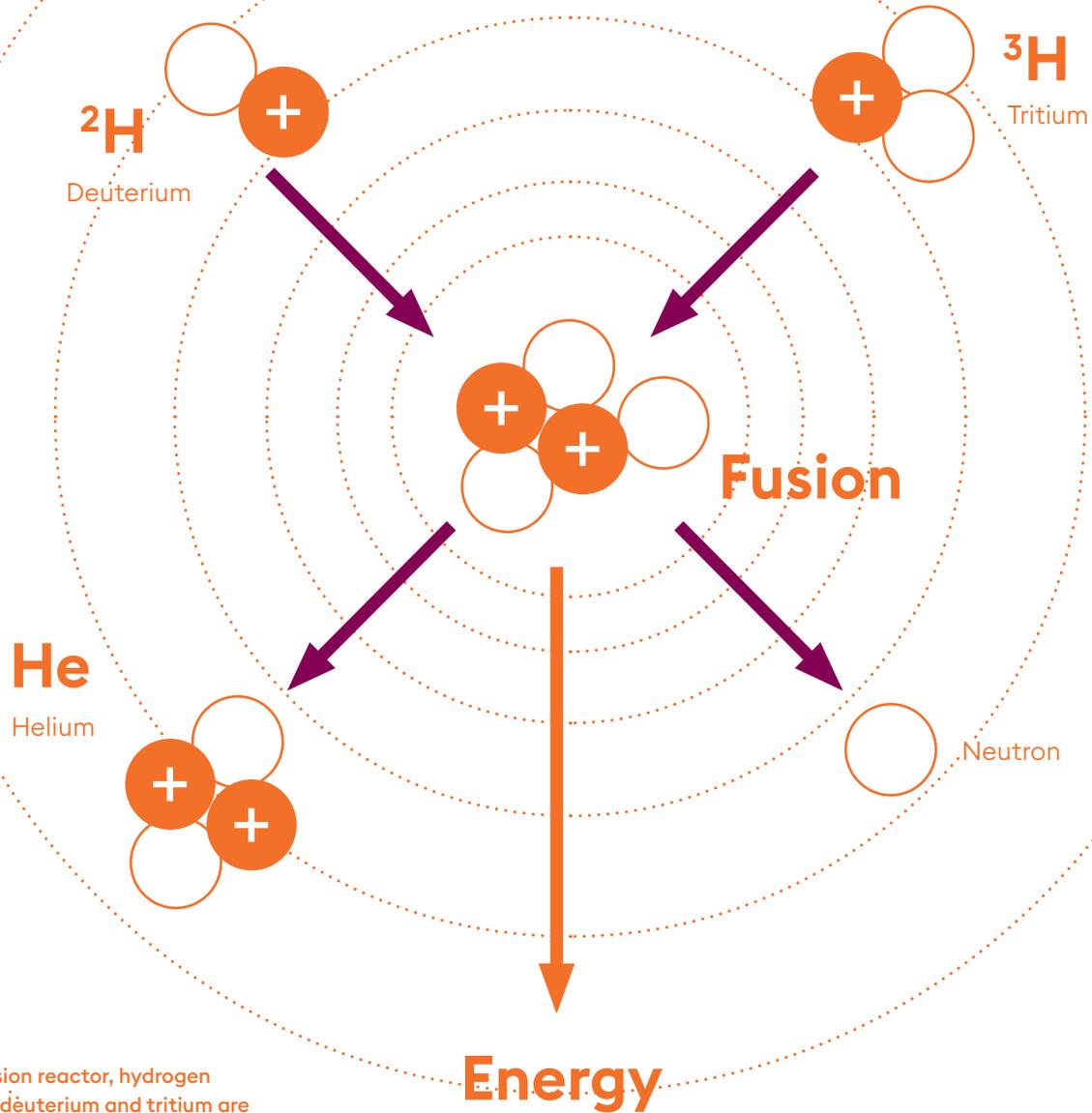
© Fusion for Energy

managing Europe's contribution to ITER – are responsible for the toroidal and poloidal magnetic fields. The fields work together to contain the plasma and consist of a special class of coils: the largest coil has a diameter of 24 meters, the heaviest weighs 400 tons. “That’s how big the coils in Cadarache have to be,” explains magnet expert Bonito-Oliva. The French mechanical engineering company CNIM, which is based in Paris, is responsible for the production and cryogenic cold testing of four out of the total of six poloidal fields. Courage and pioneering spirit are essential requirements for meeting the challenges of the ITER project. “But it’s precisely because this type of innovative project leads to people and companies going beyond their limitations that we are taking part in ITER,” says Technical Project Manager François Chastel from CNIM.

Röchling is also among the courageous companies that submitted a tender – and was awarded the contract by CNIM. CNIM expects its suppliers to do

their best to strictly adhere to delivery deadlines, and deviate from the specified technical requirements as little as possible. “With Röchling, we have found the right partner for this,” says Chastel. “We feel we are in very good hands, especially with regard to reaction time, delivery reliability, and technical expertise.”

Röchling is supplying CNIM with a large proportion of the insulation components for the poloidal magnetic field. The “fillers” are arranged next to the coils to make electrical insulation possible. From Chastel's perspective, the most important requirement for the fillers is the chemical composition of the material. Due to the environment in which the coils are positioned in the tokamak, this must not contain any boron. Boron is frequently used to reinforce fibers in plastics, but is not resistant to radiation. However, ITER requires a certain radiation resistance.



In the fusion reactor, hydrogen isotopes deuterium and tritium are fused to form helium. A new atomic nucleus is created in the process. This releases a neutron and a large amount of energy. A helium atom is left over.

Röchling Is Developing Sheet Material

Röchling Permali Composites, based in Maxéville, France, developed a sheet material based on Durostone® EPMS 7 especially for the ITER project. It is boron-free, exhibits very good mechanical strength and has very good electrical insulation properties. Vitally important: the plastic can also withstand the extremely low, cryogenic temperatures that reach lows of minus 270 degrees between the magnetic coils. The plastic material is used to make curved fillers that are between 1.8 and 2.4 meters long and 5.7 centimeters high. Some parts have a cross section that decreases from 5.7 centimeters to one

millimeter. Making the fillers requires the appropriate production expertise and state-of-the-art equipment, because the relatively large components have to be manufactured within narrow tolerances.

Machining on Precision Milling Machines

“We machined the fillers on computer-controlled five-axis precision milling machines,” reports Jean-Louis Paramelle from Röchling Permali Composites. The project provides Röchling with an opportunity to demonstrate its high level of quality in close cooperation with science and industry and to

Key Advantages of Nuclear Fusion

The aim of fusion research is to develop a safe, infinite and environmentally friendly energy source. If the project succeeds, these would be the most significant benefits:

- The **fuels** required are abundant and available for millions of years. If nothing else, this reduces the risk of geopolitical tensions.
- Small amounts of fuel can generate a lot of energy:

60 kilograms of fusion fuel
generate the same amount of energy as 250,000 tons of oil.
- **No greenhouse gas emissions** produced.
- A fusion reactor would be inherently safe: if control over the fusion process is lost, the physical reaction stops by itself.

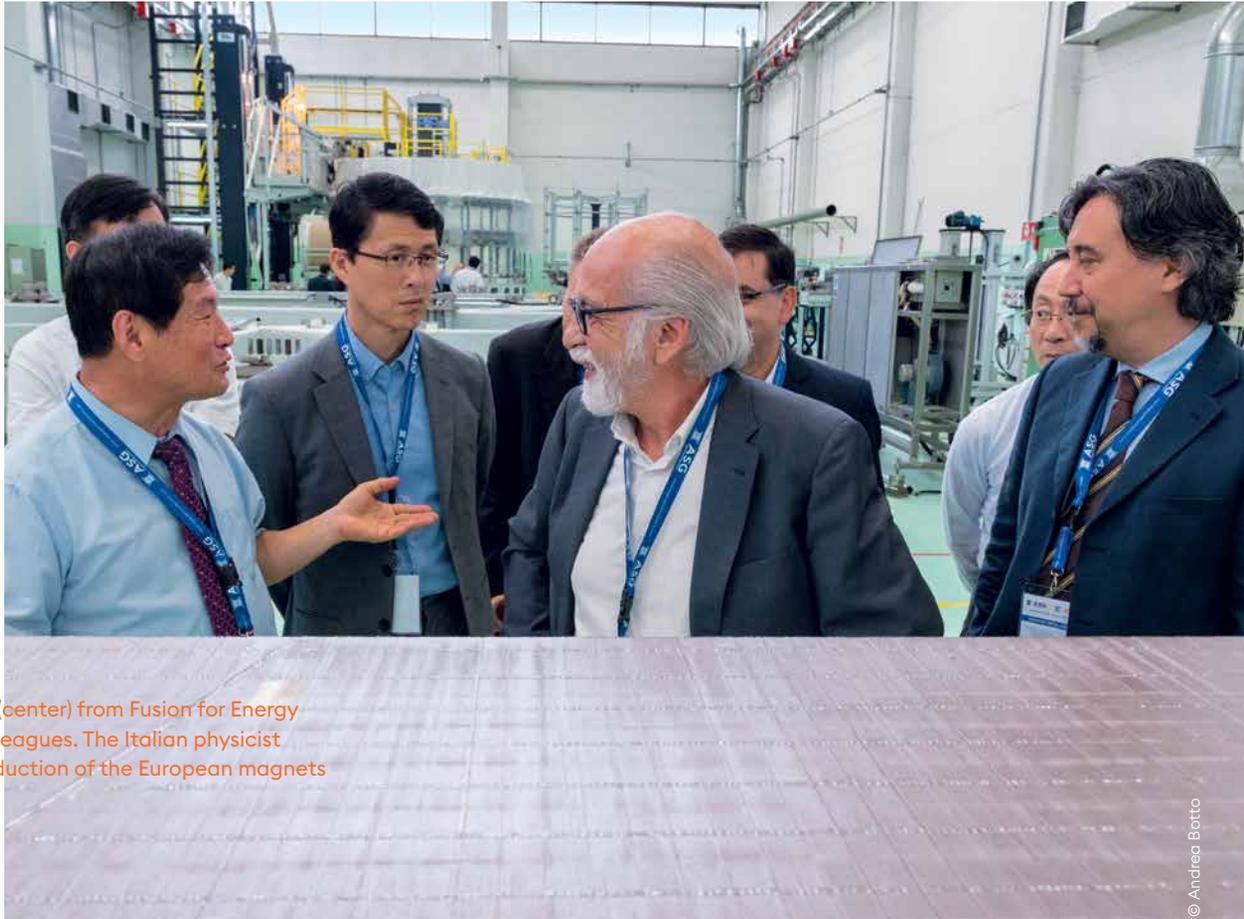
The reactor does not pose any danger for the population.
- Nuclear fusion reactors are able to guarantee a base load in the electricity supply and thereby complement renewable energies.

continue to improve. That is extremely important to Bonito-Oliva from F4E: “Quality plays a decisive role for us. If just one component fails, the fusion process has to restart.” Besides the fillers, Röchling is also supplying some smaller components in specific forms, which fill the space between the conductive parts to ensure electrical insulation.

Europe has assumed a leading role in the ITER project. In Bonito-Oliva’s view, that brings many benefits: “The European scientists, and also the European companies involved, have a unique opportunity to be right at the forefront of the development of advanced technologies and the creation of a new market.” Ultimately, a great pioneering spirit is crucial to the success of ITER, as those involved have committed themselves to a really difficult task. “But if humankind had only ever done things that promised a 100 percent chance of success, we would probably still be in the Stone Age,” says the Head of the Magnets team, who sees a real benefit for humanity in the project. “I am very proud to contribute to ITER. We are shaping the future of energy here.”

Companies Need to Be Extremely Flexible

In order to also convince industry to get on board, the scientists try to describe their requirements as precisely as possible. But let’s not fool ourselves – the researchers are developing high-tech solutions that are the first of their kind. That frequently gives rise to uncertainty as to which is the best way. This means that sometimes two technologies are put out for tender in parallel, but in the end only one is pursued. “We are reliant on extremely innovative and flexible companies that also take part when things deviate from the initial plan, and with which we can work together truly as partners,” says Bonito-Oliva. And by the same token, participating in the ITER project makes the companies more competitive. Furthermore,



Alessandro Bonito-Oliva (center) from Fusion for Energy with his international colleagues. The Italian physicist is responsible for the production of the European magnets for ITER.

© Andrea Botto

International Collaboration

A total of seven parties are involved in the ITER project: Europe, China, Japan, India, the Republic of Korea, the Russian Federation and the USA. The

European Union, which bears almost half of the costs, has established the organization Fusion for Energy (F4E), which is responsible for Europe's contribution to the ITER project.

One of the main tasks of F4E is to collaborate with European industry, with smaller and medium-sized companies and with research establishments.

the commercial partnerships between small, medium-sized and large companies promote the transfer of know-how.

The physicist is certain that as a result of this research, a series of technologies will be developed and a huge amount of knowledge, which will also be used for various applications besides nuclear fusion and have highly practical benefits, will be generated. Bonito-Oliva rejects criticism of the costs: "Compared with the insights and the many benefits that we will gain, they are low." In addition, the project is creating a large number of jobs.

The ITER scientists plan to ignite the first fusion fire in December 2025. From injecting a thermal input of 50 MW into its plasma, ITER will produce a thermal output of 500 MW for about seven minutes. Because the plasma current can be generated only in phases, the tokamak does not function in continuous operation. "ITER is all about research. We're taking the last step on the path toward commercialization," clarifies Bonito-Oliva. Only then will power plants be developed whose sole task will be to continuously generate energy through nuclear fusion. Heavenly.

Freshly Caught

Saltwater Fish

a Long Way from the Ocean



A young start-up is using plastic
from Röchling to build its
compact aquaculture facility





Christian Steinbach, Kai Wagner, and Carolin Ackermann (from the left) – the three founders of Seawater Cubes standing in the aquaculture facility prototype that has been set up in Saarbrücken, Germany.

Eastern Atlantic, Mediterranean, Black Sea – these waters are home to the *Dicentrarchus labrax*. The European seabass is found at water depths between ten and 100 meters. It takes courage and skill to rear this popular edible fish inland. A young start-up company from Saarbrücken, Germany, has been putting their plan to do so into action.

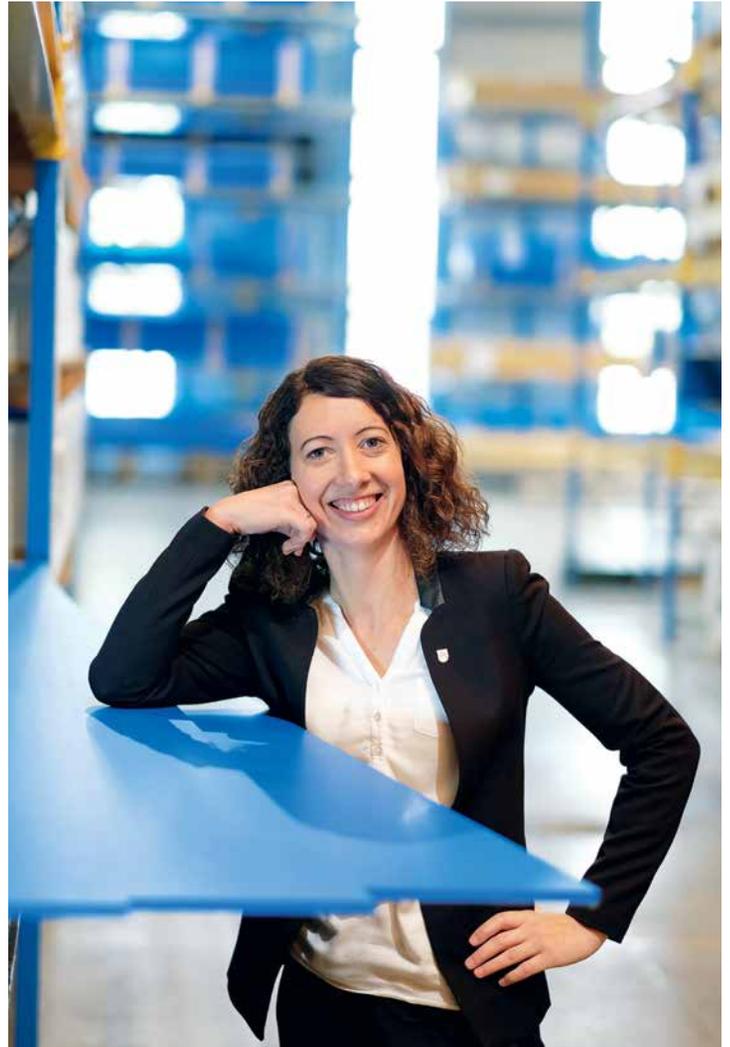


7,000 young European seabass, also known as branzino, swim cheerfully around a man-sized plastic tank, which is housed in three decommissioned, recycled, and interconnected shipping containers. The containers are set up in a hall of the old rail repair workshop in Saarbrücken-Burbach, Germany. Start-up company Seawater Cubes came up with the idea for this compact aquaculture facility. The plastic cladding of the tanks was provided by Röchling.

Seawater Cube is the first compact, standardized, and fully automated fish farm. This farm allows saltwater fish to be reared a long way from the ocean. A closed-loop system guarantees the highest water quality and a modern LED light system ensures optimum lighting. Species-appropriate, reliable, and location-independent saltwater fish breeding is the result. “The idea originated while we were conducting research in the aquaculture laboratory at the Saarland University of Applied Sciences,” explains mechanical engineer Christian Steinbach, who is one of the founders of Seawater Cubes GmbH together with electrical engineer Kai Wagner and marketing and sales specialist Carolin Ackermann. The two engineers even built a small-scale facility at the university. Their objective was to rear fish in the best possible living conditions and in a way that would preserve resources. This would then ensure that breeding is stable and sustainable.

Convinced by Their Own Idea

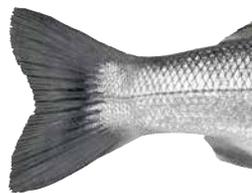
When the funding for the scientific project ran out at the university, they found that good advice came at a high price, literally. Steinbach and Wagner, who wanted to stay in Saarland, Germany, could have chosen the safer option for their future careers and found jobs in the automotive or steel industry. “But we were and still are convinced by our idea, and we definitely didn’t want to just throw in the towel,” says Steinbach. In view of persistent overfishing in



Anke Mensen from the Technical Marketing department at Röchling Industrial in Haren, Germany, is the first contact for the three founders for all things plastic. “We are very open to ventures like these,” says Mensen, who really enjoys collaborating with Seawater Cubes.

the oceans and resource-consuming mass fish farming in large aquaculture facilities, they believe the Seawater Cube has huge potential. So, the idea to found their own start-up came about quite quickly. Carolin Ackermann came on board as the business expert and together the founders applied for grant funds from the EXIST Transfer of Research, a program run by the German Federal Ministry for Economic Affairs and Energy and the European Social Fund.

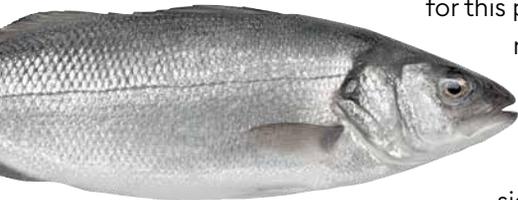
In October 2017, the team were accepted for funding amounting to 800,000 euros over a period of 24 months. “There’s been no such thing as a 40-hour week since then at least,” says Steinbach. Tight schedules need to be adhered to, and challenging assignments need to be completed. The trio are taking their start-up down a rather unconventional



route, and this requires courage. “I wouldn’t say doing something like this is in my DNA,” says Steinbach. The 29-year-old grew up in a household of civil servants, and Kai Wagner’s parents are regular salaried employees. Carolin Ackermann, on the other hand, comes from a family of entrepreneurs and knows what it takes to work for yourself in practical terms. For her, this includes having clear objectives and open communication with one another. The founding team of Seawater Cubes originally included another fellow student from the university. “But after a while, we all realized that it wasn’t working out. We had a frank discussion about it and took the necessary steps,” reports the 28-year-old.

From Steel to Plastic

As a team of three, they face even more demands. Chemical analytics, flow simulation, biotechnology, innovation, controlling – these are just a few of the issues that they had to overcome. Ackermann, Steinbach, and Wagner acquired more and more knowledge through training and coaching courses. The development and construction of the water tank was particularly time-consuming and challenging. The two engineers originally planned to use steel for this central element of the facility. Then it became clear that plastic would be a far superior material for this purpose. The benefits range from the material’s corrosion resistance against saltwater to it being significantly easier to cut. The blue color is the icing on the cake as it is perfect for the Seawater Cube brand – and is a real advantage in terms of marketing activities.



“After we had researched the possibility of using plastic, we quickly found Röchling,” says Wagner. The technical request from Seawater Cubes landed on the desk of Anke Mensen, who works in the Technical Marketing department at Röchling Industrial in Haren, Germany. “The request already included

a very specific list of requirements, which showed that someone had already done a lot of research into the subject.” And because Röchling has extensive expertise in the areas of tank construction and fish farming, the two sides quickly joined forces. “Röchling understood what we needed,” says Steinbach.

High Density, High Cleanliness

Two metric tons of polyethylene (PE) and 1.5 metric tons of polypropylene (PP) were processed to make the Seawater Cube. The tanks including the edging are made of Polystone® G Blue, a polyethylene with a high density. It has a high level of cleanliness and corrosion resistance, is used in tank construction around the world, and is approved for contact with food – nothing from the material migrates into the environment. Polystone® P is used in the filter systems. The PP material is highly durable and resistant to substances including lime, which is used to stabilize the pH value of the water.

The plastic was delivered to Seawater Cubes in sheets that measured three meters by 1.5 meters and had to be cut and assembled on site. To do this, Wagner attended a training course in extrusion welding of PE and PP at the Koblenz Chamber of Skilled Trades and Crafts and then welded the sheets together himself. The team also brought in a structural engineer for good measure. “We didn’t want to risk making any mistakes at this point,” says Steinbach. The prototype has now been finished and is used for demonstration purposes. “The whole thing doesn’t work without a prototype. We need our potential customers to experience the facility, like when you test-drive a car,” says Wagner.

New applications and products like the Seawater Cube are also particularly exciting for Röchling. “We are very open to ventures like these, particularly when it concerns innovative and sustainable projects,” says Mensen. The start-up team not only demonstrates courage but they are also open and talk in detail about the practical work that went into the prototype. There is a strong foundation of trust. “This is another reason why you end up feeling particularly strongly



The very first fish in the prototype:
the European seabass are two months old
when they are put into the tanks.

about projects like these,” says Mensen. Röchling had not done a lot of work with start-ups until this point, but it does keep in close contact with universities and works with them on projects concerning material development.

Farmers as Potential Customers

Alongside operating its prototype, Seawater Cubes has been spending the past few months building its sales. It has established contact with potential customers. Among them are many farmers who want to expand their businesses. For them, dealing with animals is nothing new, they understand the responsibility involved and know what it means to be available 24 hours a day, 365 days a year – even if the automated solutions in the Seawater Cube do almost all the work. Marketing to the food retailing or catering industry is also a possibility.



To optimally prepare themselves for the period after the funding has expired, the young founders have brought on board two “business angels” who will support the project with expertise and capital. Their mentor, biologist Prof. Uwe Waller, also continues to pass on his expert advice to the trio. With the first pilot facility that will follow on from the prototypes, Seawater Cubes needs to demonstrate that the system can function seamlessly and economically and that the fish can be distributed. Over the next ten years, Seawater Cubes would like to roll out approximately 120 facilities in Germany and around 100 internationally.

seawatercubes.de

How the Seawater Cube Works

The aquaculture facility is housed in three inter-connected shipping containers and this separates it from the external environment. The weather, microplastics, heavy metals, waste, and pathogens are not an issue for the Seawater Cube. A hygiene barrier further increases production reliability. Up to seven metric tons of saltwater fish can be produced every year on a floor area of 100 square meters.

The Seawater Cube functions as a closed-loop system: the water – potable water with added salt to equate to sea water – is continuously circulated and purified using state-of-the-art filter technology. The founders have filed patent applications for several of the filter components and have coupled them with tried-and-tested single components from aquaculture technology. The main challenge is to ensure perfect interaction between all filters so that the water meets the high demands for fish breeding. The facility also automatically adjusts to the lighting conditions in the animal's natural environment and to their day-and-night rhythm. Sunrise and sunset are simulated using artificial LED lighting.



A model of the compact aquaculture facility: the fish are reared in different areas of the tank depending on their size and age.

The prototype is suitable for rearing gilt-head bream as well as European seabass. It will also be possible to accommodate other breeds of fish in the future, such as kingfish and black tiger prawns. The maximum stocking density of European seabass and gilt-head bream in aquaculture is 100 kilograms of fish per cubic meter of water – according to the specifications of the start-up team, the Seawater Cube is designed to hold a maximum of 65 kilograms to ensure sustainable and humane rearing. The fish are bought from a breeder as “young stock” at around two months old, and they are placed in the first section of the tank. The fish stay here for four months and they are fed organically and reared without the use of any medication. When each fish has reached a weight of approximately 50 grams, they are carefully moved into the second section of the tank using a net. Here they continue to grow for another four months until

they weigh 150 grams. It will then take another four months until the fish are ready for the market. They now weigh between 350 and 400 grams. In the third tank, they are removed from the water with a net, stunned, slaughtered, and then distributed fresh on ice.

The automated solution means that the tank operator only needs to spend an average of 1.5 hours a day working in the facility. The facility is connected to the cloud of Seawater Cubes GmbH. As a result, process and production data is constantly available in real time. Providing the customer with everything they need from a single source was also part of the start-up’s idea. From delivery and commissioning of the facility, to delivery of the fish seeds and the feed, and finally remote monitoring and support in relation to sales and marketing.

Automotive

The Automotive division designs and engineers components and system solutions in the fields of aerodynamics, propulsion, and new mobility. As part of our customer-oriented and global development approach, we focus on the current challenges facing the automotive industry: reduction of the environmental impact and improvement of the customer experience.





1,232
million euros in sales

6,098
employees

42
locations

AUTOMOTIVE DIVISION

Standing

Strong During

Turbulent

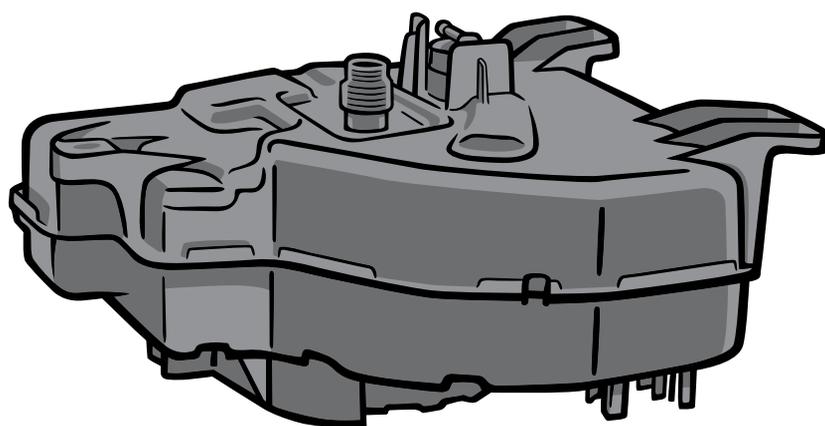
Times

Röchling continues to support
diesel technology – and is optimizing
it with increasingly innovative
SCR tank systems



Standing strong: Röchling is working hard to make diesel even better. Christoph Ganthaler emphasizes that various different components and functions can be integrated into the SCR tank from Röchling thanks to the injection molding technique.

Swimming against the tide: diesel vehicles have fallen into disrepute due to their pollutant emissions. In light of this, it takes strong convictions, resolve, and courage to not blindly follow the same path as everyone else. Röchling Automotive is objectively evaluating the advantages and disadvantages of diesel and is striving to make it even better.



The fundamentally bad reputation of diesel-powered vehicles at the moment is hardly surprising given the fraud scandals, driving restrictions, and unexplained financial compensation for drivers. One thing is definite: the current emission levels, mainly from nitrogen oxide, are primarily due to the old stock of diesel vehicles from the Euro 5 standard and earlier standards. Modern diesels that have been on the roads since 2016/2017 are superior to any gasoline engine when it comes to exhaust emissions. If you look at the overall impact on the environment, they even beat electric cars that run on batteries.

“We see diesel as indispensable in the longer term too, mainly due to its low consumption and comparably low carbon dioxide emissions.”

Walter Kral, Director Product Area Propulsion

Diesel vehicles can therefore certainly be trusted to keep air clean in inner cities. This is also the opinion of Prof. Thomas Koch from the Institute of Piston Engines at the Karlsruhe Institute of Technology, Germany: “If only state-of-the-art diesel vehicles were on the roads, the contribution of diesel to nitrogen oxide emissions would only be three

micrograms per cubic meter,” says Koch. As a comparison, the current EU limit value is 40 micrograms.

Röchling as a Pioneer of SCR Technology

“We see diesel as indispensable in the longer term too, mainly due to its low consumption and comparably low carbon dioxide emissions,” emphasizes Walter Kral, Director Product Area Propulsion at Röchling Automotive in Laives, Italy. The company is one of the pioneers of SCR technology (selective catalytic reduction), which transforms the diesel engine into an efficient and clean drive unit for cars. Röchling Automotive has been developing SCR tanks since 2011. Back then, the only tanks available on the market were blow-molded. “Our injection molding technique means that we can achieve significantly thinner wall thicknesses and other components and functions can be integrated into the tank,” explains Christoph Ganthaler, Head of Product Line Fluid Solutions. At the time, Röchling Automotive’s extensive experience in manufacturing compensation tanks helped them to develop their SCR tank. “We knew that we could do it right from the outset,” says Kral. “It” meant developing and producing 25 to 30 liter tanks, and then integrating a wide range of other components into them. And those who want to establish themselves as pioneers need all the courage they can muster.

In 2013, the first SCR tank from Röchling Automotive went into series production at a car manufacturer. A number of other manufacturers followed suit. They were particularly impressed by the fact that Röchling Automotive constructed its own welding and manufacturing facilities and produced the devices in-house. “That’s a real advantage. The customer sees that we have experience of the process from A to Z,” explains Kral assuredly. The in-house plant construction coupled with a vast openness to new ideas also mean that Röchling Automotive can work particularly fast, for example in the development of a prototype. In addition to this, they maintain open, transparent, and honest communication. “Our customers generally want a partner who is willing to weigh in – and who doesn’t make promises they can’t keep,” says tank specialist Kral with confidence.

System Expertise in Tank Design

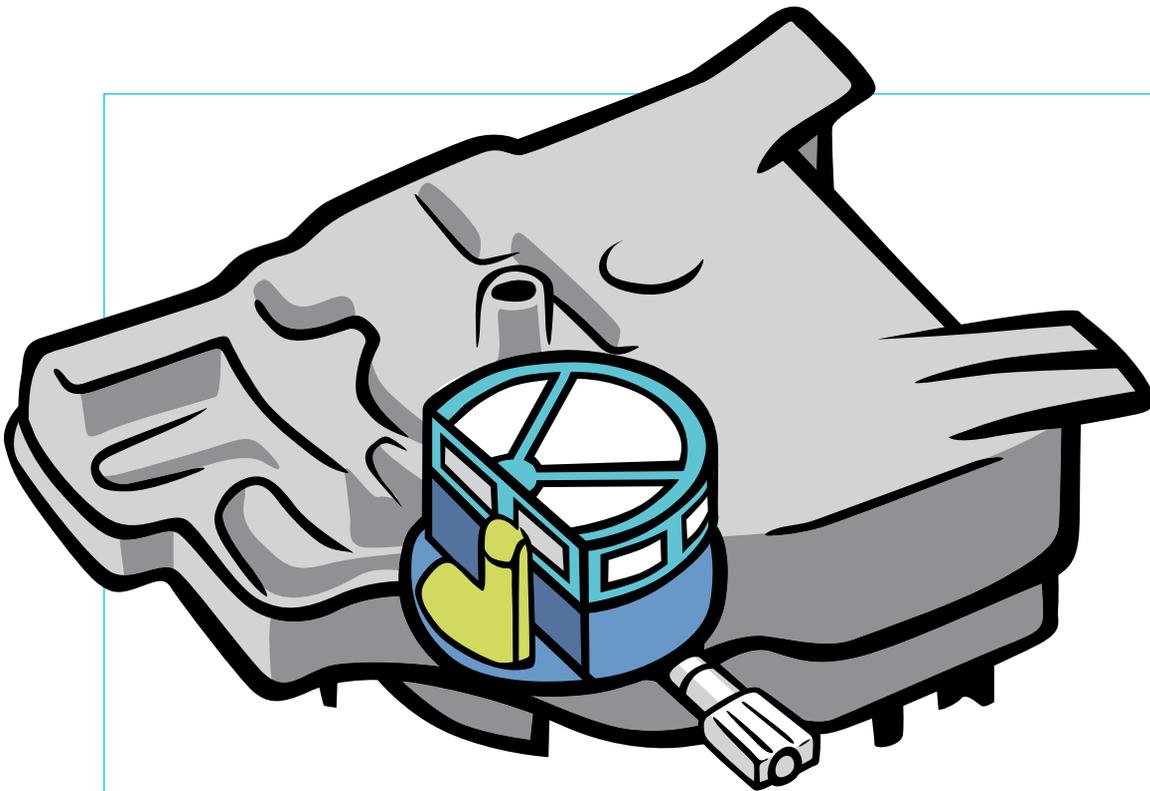
Röchling Automotive has now developed extensive system expertise in SCR tanks and is working tirelessly on further optimizations. For example, the vent valve and a bubble section have been integrated in the filling head to save valuable installation space in “odorless” filling systems. Parts of the vent line are also integrated into the tank shell. The tank design has been optimized so that frozen AdBlue can be better distributed in the tank in very low minus temperatures and to prevent tank deformations.

The aqueous urea solution AdBlue is indispensable in SCR technology. A full-surface heater is used to defrost frozen AdBlue. It is activated via an electronic control unit and heats the entire tank bottom to ensure that enough liquid AdBlue is available. Röchling Automotive prevents the AdBlue from making distracting sloshing noises by using injection molding during the manufacture of the SCR tanks to create anti-slosh baffles.

“Our customers generally want a partner who is willing to weigh in – and who doesn’t make promises they can’t keep.”

Walter Kral, Director Product Area Propulsion

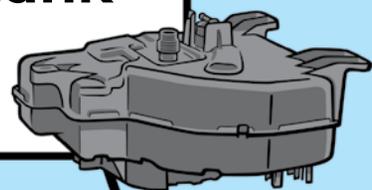
The engineers from Röchling Automotive are currently applying their expertise and experience in tank design to a different field. It isn’t just diesel vehicles that have to contend with increasingly stringent emissions limits, as gasoline engines also have to comply with every tightened standard. “The demand for clean, efficient vehicles with gasoline engines will increase in the future,” predicts Kral. Röchling wants to be at the forefront of this and is therefore intensively looking into the field of water injection – an interesting way to reduce pollutants and carbon dioxide emissions.



The Idea

Conventional gasoline engines use gasoline to cool the engine during high-load operation – and the environment pays the price. Water injection replaces the “additional” gasoline with water. “This enables significant fuel savings while reducing CO₂ emissions at the same time,” explains Kral. Röchling Automotive is currently working on an end-to-end water injection system. At the heart of the solution is the extremely important water tank. The shape and capacity of the tank are individually adapted to the manufacturer’s requirements. This makes optimal use of the available installation space, ensuring that the water has to be refilled as infrequently as possible. The developers are also tackling a well-known winter problem with a newly developed water tank heating system with a high defrosting performance. Prevention of “biofilm” is another typical requirement for water tanks. Thanks to an integrated bio-decontamination function developed by Röchling, this unwanted byproduct can be prevented efficiently, in an environmentally friendly manner, and without any additional energy expenditure. The market launch for the water injection system is planned for 2020/2021.

Vehicle with
SCR tank
Reduction
of NO_x
emissions



PARK & RIDE



UP TO EURO 5



DIESEL UP TO EURO 5



NO_x
 NO_x
 NO_x
 NO_x
 NO_x
 NO_x



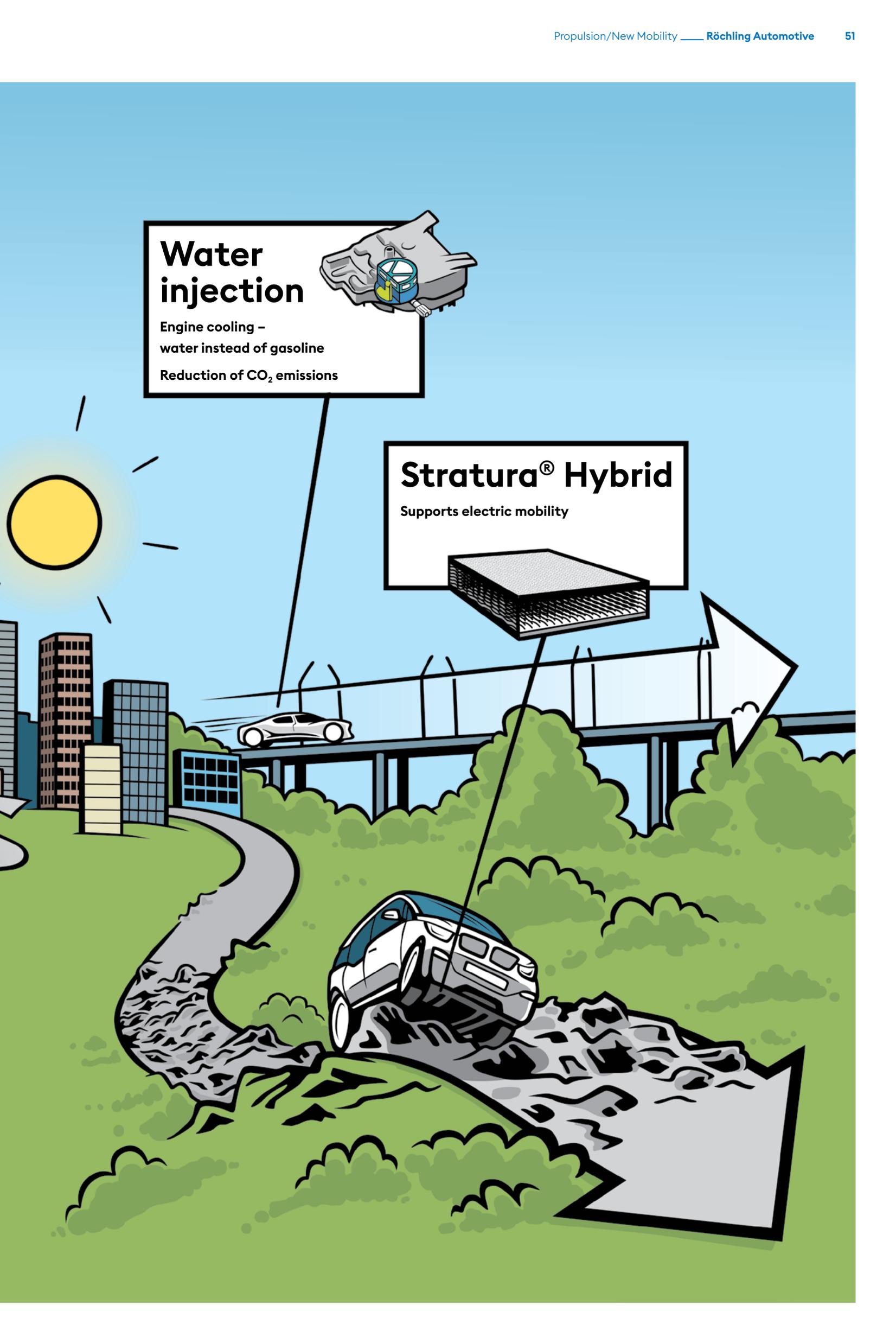
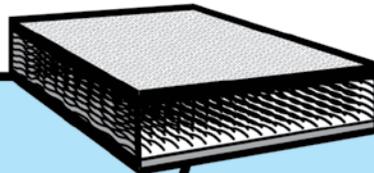
Water injection



Engine cooling –
water instead of gasoline
Reduction of CO₂ emissions

Stratura® Hybrid

Supports electric mobility



AUTOMOTIVE DIVISION



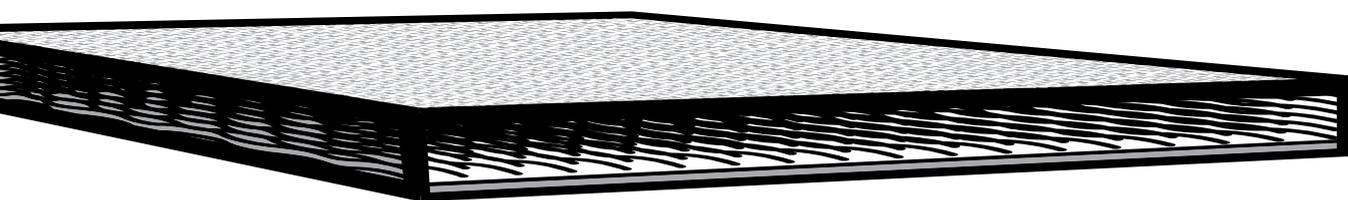
Ultimate



Protection!

New materials from Röchling protect sensitive components in electric cars and guarantee a light weight

In the discussion about the sustainable mobility of the future, electric mobility is one of the most promising concepts out there. It offers the prospect of CO₂-free transport, making it an important element of the energy revolution. However, progress has been slow – especially in Germany. Persistence and patience are required.



Based solely on the sales figures, electric mobility is still a niche concept in the vast majority of countries. But many people think that electric cars have been replacing diesel and gasoline engine-powered vehicles for a long time now. Despite all the gloomy predictions with regard to the scarcity of raw materials required to produce the batteries and the inadequate charging infrastructure, the number of electric cars is constantly on the rise. The International Energy Agency (IEA) deems electric

vehicles to be one of the four prevailing propulsion technologies that reduce emissions and achieve long-term sustainability goals.

Sales Incentives and Driving Restrictions

According to the IEA, the growth of electric mobility is primarily being driven by government schemes, which include sales incentives, local driving restrictions for cars with combustion engines, or CO₂ emission specifications. The IEA believes that the progress

made in recent years in terms of reducing the costs of batteries and increasing their capacity has also acted as an incentive to purchase electric cars. If enough people are courageous enough to take this step, the market will continue to pick up speed.

Röchling is striving to stay on the ball in this movement and is contributing to developments and research that will help to further establish electric mobility. The company got involved in the field of e-mobility at an early stage, for example with its participation in the “StreetScooter” project,



This material is made to last: Stratura® Hybrid is an excellent material for vehicle floors and for protecting battery systems in electric cars.

a commercially organized research initiative at RWTH Aachen University, Germany. When the first short distance vehicle – an affordable and sustainable electric vehicle for short-distance journeys – was being developed at the university in 2001, Röchling made an important contribution to the vehicle floor concept with its material Stratura®. The special feature was that the underbody and internal floor were merged to form a single unit. The thermoplastic composite material Stratura® provides the perfect combination of heat insulation, noise reduction, and

stability. Its special thermal insulation properties help to keep the interior warm. “This is an interesting feature, especially for electric vehicles, because less energy is required to heat up the interior, meaning the range of battery-powered electric cars is extended,” explains Markus Sattel, Head of Product Line Structural Lightweight.

Röchling Automotive has now further developed the material and created a stable hybrid solution by integrating aluminum layers. Stratura® Hybrid is a multilayer material marvel for

a wide range of application areas. The hybrid material combines acoustically effective, and thermally insulating glass fiber lightweight reinforced thermoplastics (LWRT) created using pressing technology and microperforated aluminum layers. One way the material is being used is for the multilayer Integrated Sandwich Floor, which is replacing the conventional car body floor. The material reduces the floor weight and thickness by up to 50 percent in comparison to conventional car body designs.

Electric Cars Around the World

1.05 million

1.05 million electric cars were sold in China in 2018. That is 82 percent more than in the previous year – and around 60 percent of the electric cars sold worldwide. The market share of these vehicles in terms of total registrations in China rose to 4.4 percent. The proportion of purely electric vehicles was 75 percent, while the rest were plug-in hybrids. Around 95 percent of the Chinese automotive market is dominated by Chinese car manufacturers.

Source: Center of Automotive Management (CAM); the figures refer to purely electric cars and plug-in hybrids; they do not include commercial vehicles.

+ 86 %

In the USA, the sales figures for electric vehicles rose by 86 percent to 361,000 cars in 2018 in comparison to the previous year. The country is therefore the second most important electric mobility market after China by quite some distance. In total, the market share of electric cars in the USA has almost doubled from 1.1 percent to 2.1 percent.

“The high rigidity and the acoustic absorption behavior of the material in particular offer significant advantages for electric mobility,” says Sattel.

Battery Reliability Is a Crucial Factor

Another application of the material is to protect battery systems in electric vehicles. As vehicles are being fitted with increasingly powerful electrical systems that require energy, battery reliability has become a critical factor during the vehicle design. Where previously metal

housing was used to protect the battery, it is plausible to use plastic-based housing materials to reduce costs and weight. This is where Stratura® Hybrid comes in: the material demonstrates a high degree of elasticity and a large elongation at break to absorb the amount of energy generated during a crash. The result: no rupturing, no splitting.

Protection Against Electromagnetic Effects

Stratura® Hybrid also protects the electrical components in electric vehicles against

interference from unwanted electrical or electromagnetic effects. Stratura® Hybrid achieves this EMC protection by using aluminum foils as a mechanical strengthening layer.

Röchling Automotive has been systematically accelerating the development and production of various plastic components specifically for electric cars, and it will continue to do so. Battery housing uppers manufactured from the material SMC (sheet molding compound), covers, cell frames, and insulation plates have already been put into series production by some well-known car manufacturers.

49.1 %

73,000 electric cars were newly registered in Norway in 2018. This is an increase of 18 percent. The country further confirmed its exceptional position with a market share of electric vehicles that climbed from 39.3 percent in 2017 to 49.1 percent in 2018. According to sales figures and market shares, Norway remains the most important country in Europe when it comes to electric mobility.

68,000

In Germany, new registrations of electric cars rose to around 68,000 cars in 2018 – an increase of 24 percent compared to 2017. The market share increased from 1.6 percent to 2.0 percent, which is low compared to the major automotive countries. The proportion of purely electric cars increased to 53 percent, while 47 percent were plug-in hybrids.

+ 24 %

Great Britain has seen an increase of 24 percent with 60,000 electric vehicles sold. In France, 46,000 electric cars were newly registered – 23 percent more than in 2017. In Sweden, sales of electric vehicles rose to just under 29,000 units, which brought the market share to 8.1 percent. In the Netherlands, sales figures of electric vehicles tripled to around 27,000. The market share also rose to 6.0 percent.

Medical

The Medical division offers customers a wide range of high-quality, customized components and assemblies, including end-to-end OEM products. The product portfolio also includes standard plastic products, with special expertise in the fields of diagnostics, fluid management, pharma, surgery and interventional, and much more. These areas of competence are complemented by an enhanced range of services for development and regulatory affairs, all the way to approval of finished devices and other medical products.





122

million euros in sales

1,097

employees

6

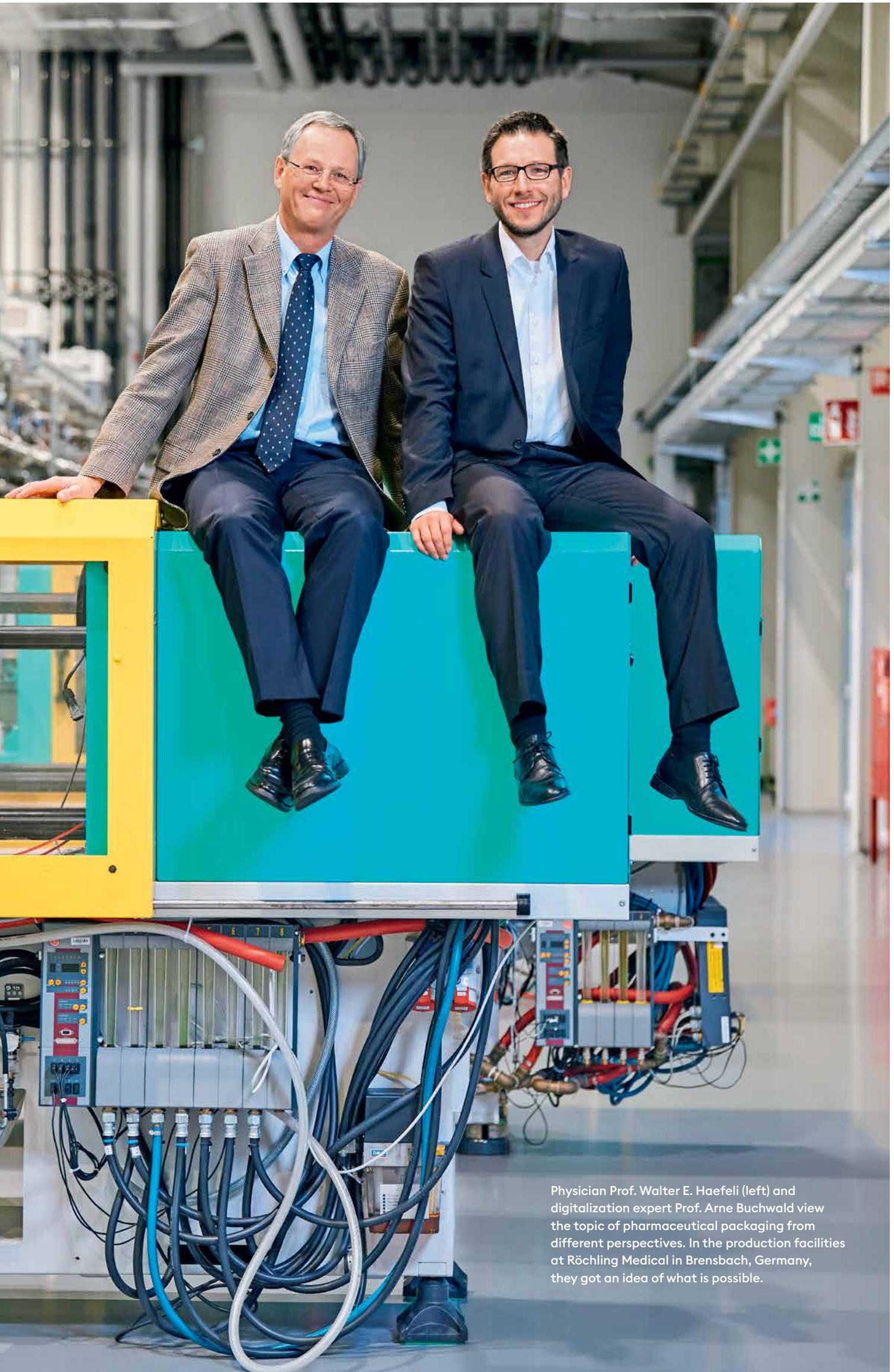
locations

A Smart Cap

MEDICAL DIVISION

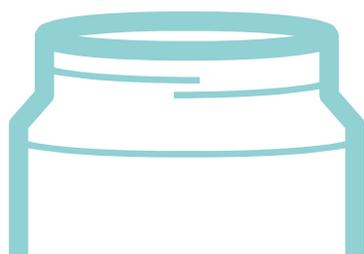
**MBA students from the EBS Business School
pitch their ideas for intelligent pharmaceutical
packaging for blind people**





Physician Prof. Walter E. Haefeli (left) and digitalization expert Prof. Arne Buchwald view the topic of pharmaceutical packaging from different perspectives. In the production facilities at Röchling Medical in Brensbach, Germany, they got an idea of what is possible.

Intelligent pharmaceutical packaging with built-in electronics is no longer a vision from the future. Röchling Medical is participating in a project that is developing containers to make it easier for patients to take their medication. This involves thinking outside the box. That is exactly what Röchling Medical has done – as the sponsor of a start-up workshop for MBA students from the EBS Business School in Oestrich-Winkel, Germany.



HOW do patients take their medication?

To ensure that medical treatment is successful, it is extremely important that patients take their medication exactly as prescribed. Numerous studies show that following treatment instructions properly is hugely beneficial. However, investigations also show that lots of patients ignore their treatment plans – due to stubbornness, carelessness, or because they feel overwhelmed. Others find it difficult to open and close pharmaceutical packaging, for example patients who suffer from rheumatism and struggle to move their fingers, or people with poor eyesight or those who cannot see at all. This has brought the topic of smart packaging into focus. Intelligent packaging is likely to bring with it a range of benefits when it comes to taking medication.

WHAT does networking mean?

Data will also play a significant role in intelligent packaging. The keyword is networking: packaging is connected to a smartphone or tablet, information is extracted from the packaging and package inserts, and this information is made available to the patient via a user-friendly app. It is also conceivable that data could be made available to the pharmaceutical manufacturers to help them improve their products – for example, if an inhaler always has to be shaken to make it work properly after repeated use due to a malfunction. Side effects could also be directly communicated to the manufacturer. The plan is for Röchling to support the analysis of the data generated in this way in the future in order to improve the products.



Prof. Walter E. Haefeli from the University Hospital in Heidelberg, Germany, is primarily researching how to reduce errors, risks, and side effects when administering medication.



Prof. Arne Buchwald from the private EBS Business School has closely accompanied the MBA students at the start-up workshop and during the pitch. It is very rewarding for the students to work on real-world examples.



WHEN is packaging considered intelligent?

What should intelligent packaging be able to achieve? It could remind the user when it is time to take their tablets, for example via their smartphone or directly through a built-in electronic unit in the packaging. It is also conceivable that an emergency doctor could be informed automatically if vital medication has not been removed from its packaging. Intelligent packaging also facilitates communication between the patient and the doctor, as the doctor can see at a glance how closely the patient has been adhering to treatment instructions. All in all, intelligent packaging adds value, is user-friendly, and makes life easier for patients.

HOW is Röchling Medical involved?

Röchling Medical mainly manufactures primary packaging material made from a variety of plastics, such as bottles with screw caps for loose tablets or containers for infusions. When it comes to digitalization, Röchling is leading the way in product development to ensure it can continue being a competent partner when collaborating with customers. Röchling Medical has established an extensive network to purposefully and optimally address the topic of electronics in intelligent pharmaceutical packaging. The same goes for quality management: this also involves close exchange with institutes and laboratories in order to identify all the specific international standards that need to be complied with when integrating electronic components into pharmaceutical packaging.

WHAT is Röchling Medical currently working on?

Intelligent packaging systems need to be accepted by patients, doctors, and manufacturers at the same time to ensure that they have a strong market potential. From the start of development through to series production, the practical use of the new packaging is analyzed using patient surveys and tests. Over the past few months, initial ideas and studies into new intelligent packaging have been assessed by Röchling Medical at the Heidelberg Hospital. Röchling Medical has also been presenting new ideas and solutions in discussion groups with customers. “The intelligent components already need to have a very robust design during the development stage so that we can assemble them quickly and cost-effectively in large-scale series production conditions – just like we already do in our other assembly groups,” says Ralf Tröbs, Development Manager of the Business Unit Röchling Medical Europe. The built-in intelligence

ranges from a chip to an acoustic or optical signal transmitter to end-to-end electronic systems. These components are developed together with partner companies and then produced and delivered to Röchling Medical. Röchling Medical is responsible for finalizing and dispatching the finished product.

WHO initiated the pitch project?

The start-up workshop including the pitch was an initiative of the Werte-Stiftung (Values Foundation). Using financial resources from industry and an extensive network, this foundation promotes public discourse about values and supports processes to build values. The “Futury” program is another Werte-Stiftung initiative. This involves companies – in this case Röchling Medical – being put in touch with talented individuals from universities. Together they work on developing new approaches and business models.



WHAT was the pitch project about?

As the sponsor, Röchling Medical was involved in the pitching event on the topic of intelligent pharmaceutical packaging that was organized with 30 international students from the EBS Business School in Oestrich-Winkel, Germany. Röchling started by explaining the technical, pharmaceutical, and commercial requirements of the intelligent packaging to the MBA students, who all had a business or engineering background. The students then had two weeks to work on the topic in greater depth. At a second meeting, the six teams had 48 hours to develop their favorite concept and work on the associated business case. “When we received the request for the project, we primarily saw the opportunities it offered, and not the effort and expense that would go into it,” says Joachim Lehmann, Director Business Unit Medical Europe. This entrepreneurial spirit was rewarded with interesting and very diverse approaches to intelligent pharmaceutical packaging solutions.



WHO won the pitch?

A jury selected one team as the winners at the end of the event. The students in this team came up with the idea of voice-controlled packaging that was supposed to help blind people take their medication. An electronic unit was integrated into the screw cap of the bottle. The students already had a prototype ready to present as part of their pitch, which included the commands for opening and closing the packaging being played on a laptop as a sound sequence.



WHAT does the digitalization expert say?

Prof. Arne Buchwald is a junior professor for digital transformation and the scientific head of the Center for Digital Transformation at the EBS (European Business School) private university. Buchwald worked closely with the MBA students at the start-up workshop. The aim was to take well thought-out theories regarding the integration of digital platforms outside the lecture hall and transform them into business ideas. “We want to provide our students with an excellent education, and part of this is giving them the opportunity to work on real-world examples,” says Buchwald. This is why the topic of intelligent pharmaceutical packaging was particularly interesting, because it is very relevant to a lot of people. The professor is certain that there will be no issues with the packaging when it comes to data protection and security. Legal provisions, precisely defined access rights, secure data connections, fingerprint or password protection – there are many ways to ensure maximum security.



Pharmaceutical packaging should be uncomplicated and practical. It can also provide more security – for example, through a chip or entire electronic systems integrated into the screw cap on the medication bottle.

WHAT does the physician think?

Prof. Walter E. Haefeli is the Medical Director of the Department of Clinical Pharmacology and Pharmacoepidemiology at the University Hospital in Heidelberg, Germany. His main area of concern is how to reduce errors, risks, and reciprocal and side effects when taking medication, and how to maximize the success of treatment. What mistakes are made and when – which are crucial and which are not? What data sources are used to make decisions? How do we ensure that important information is reliably communicated? How can medicines be administered in a way that ensures that the active ingredient reaches the right area of the body? What should be included in a package insert – what does the patient need to know? Together with his team, Haefeli examines the effects and side effects of medication. “We use highly sensitive analytical resources at the hospital that are among the best in the world,” says the physician. In order to prevent harmful interactions or mistakes when writing prescriptions, Haefeli and his team have developed a software-supported medication information system that can be used to find information on medications and active ingredients within seconds as well as to access specialized information and package inserts. In terms of packaging, Haefeli believes it should primarily be the task of companies like Röchling Medical to develop uncomplicated and practical solutions that will simplify patients’ lives and increase safety. For some medications, this could be life-saving: “Many people who suffer a stroke were not taking their medication properly beforehand. Think of what we could gain if smart packaging were able to help with this problem.”

MEDICAL DIVISION

To Buy or

Röchling is enhancing its position as a supplier of sophisticated medical technology products through acquisitions





Not to Buy?

Even though plenty of people try, it is impossible to predict the future, even with a crystal ball. But it is possible to analyze, evaluate, and weigh up future risks and opportunities against one another. Lots of management decisions are based on assessments like these – including deciding whether or not to purchase another company. Röchling has a lot of experience in this. The company has taken over a number of firms in the medical sector and successfully integrated them into the group over the past few years.

The Röchling Group has been expanding its Medical division for several years – in 2018 alone, there was a new acquisition in Germany and another in the USA. “We have been establishing a network of companies that will give us a solid foundation for stable corporate development in the future. This takes a certain amount of courage,” says Prof. Hanns-Peter Knaebel, who is CEO of the Röchling Group and responsible for the Medical division.



“There need to be synergies with what already exists. Acquisition deals only make sense if both companies can work together to achieve something in the future.”

Dr. Joachim Brunswicker, Commercial Director
of the Industrial and Medical divisions

A strong third sector, alongside the Industrial and Automotive divisions, makes Röchling less dependent on economic developments. The area of medical technology provides long-term and above-average growth prospects. It is one of the most innovative and fastest growing sectors: health will always be important, particularly at a time when the population is getting older and older. There are also many areas of medicine where it is now possible to replace traditional

materials, such as metals, with high-tech plastics. This is where Röchling steps in with its material expertise.

When it comes to acquisitions, the group focuses primarily on medium-sized, owner-managed companies that have earned a very good reputation with regard to quality and innovation and that can be easily integrated into the Röchling Group. The companies should not be too big in terms of sales and the workforce, and restructuring cases are ruled out from the outset.

Röchling has developed a strategy to decide which companies will even be considered for acquisition. The bottom line is that the new company needs to ideally strengthen the Röchling Group's product portfolio, production technologies, and customer structure. “There need to be synergies with what already exists. Acquisition deals only make sense if both companies can work together to achieve



“You have to send out a clear message, and you must not promise things that you cannot deliver. That would be the biggest mistake because then you lose face.”

Lewis H. Carter,
Director Business Unit Medical North America

something in the future,” says Dr. Joachim Brunswicker, Commercial Director of the Industrial and Medical divisions and member of the Röchling Management Board. During his 19 years at Röchling, he has supervised 18 company acquisitions.

Röchling continuously and actively keeps an eye on possible takeover opportunities in the target segment. It is well known in the market that Röchling Medical intends to continue to grow both internally and through external acquisitions. This results in regular inquiries from merger

and acquisition specialists about whether a particular company might be suitable for Röchling. If a suitable company is identified after Röchling has performed an initial rough preselection process, an extremely confidential process commences in which all steps are prescribed by law, from initial contact to potentially signing a purchase contract. A “non-disclosure agreement” (NDA) is signed at the start of the process in which both parties agree to keep all information resulting from the sales process confidential from third parties. Due diligence can only commence once a general agreement on mutual interest and the approximate value of the company has been reached. This involves a handful of proven experts acting on behalf of the buyer thoroughly examining the data made available by the seller in electronic data rooms.

Accurately Identifying Risks and Opportunities

The Röchling team includes one representative from each of the areas of law, taxes, finance, sales, marketing, and production, as well as external auditors, lawyers, and tax consultants. The aim is to determine as accurately

as possible the liabilities that would arise from the takeover in all areas. This includes, in particular, financial, legal, fiscal, strategic, and technological aspects. The opportunities and risks of the products are also examined. According to Lewis H. Carter, who heads the Business Unit Medical North America in the Medical division and, like Brunswicker, is a member of the Röchling Management Board, it is important to try and get a feel for the company during this process. “The closer you can get to the seller’s management team, the better. This is how you find out about the problems and ideas of the company,” says Carter.

Good Understanding of the On-Site Conditions

In relation to this, it is also important to address cultural factors or any other particular circumstances that are relevant to the country in which you wish to operate. A takeover would be extremely difficult without any knowledge of the on-site conditions. “But as long as you have assessed all the significant risks, it is highly unlikely that you will acquire an incompatible

company. We do not buy anything that we do not understand,” adds Brunswicker.

If the two sides cannot reach an agreement, the process is aborted – and the sooner this happens the better. In this case, you have to be brave enough to make a clean break, even if a lot of time and money has already been invested. If, however, a deal is struck, Röchling makes sure that its top management team is introduced to the new member of the family right away, ideally on the same day as the handover. The motto is to answer questions openly, honestly, and as comprehensively as possible and to inspire confidence for a joint and prosperous future. Employees want to know what’s going to happen to their company, if jobs are going to be cut, how to proceed with operating agreements. “You have to send out a clear message, and you must not promise things that you cannot deliver. That would be the biggest mistake because then you lose face,” says Carter. The Röchling team also needs to be constantly updated on progress.

Röchling also sees it as essential to have a strong management team from its own ranks on the new site for the first few years after

the acquisition. It is not possible to manage the integration of a company remotely. Carter, who has worked for Röchling in the USA for 35 years, speaks from experience. In 2012, he was the driving force behind the takeover of the American plastics specialists Advent Tool & Mold Inc. with its head office in Rochester in the state of New York, and he was later appointed as President of the company. This gave the integration a real boost. Carter also played a major role in the acquisition of the American company Precision Medical Products, Inc., in 2018, which now operates under Röchling Medical Lancaster. The owner established a special level of trust with Carter and entered an additional condition of the sale two weeks before signing the contract: Carter was to be the head of the new company. So that is what happened. "The chemistry between the parties involved in the process of acquiring a company always has to be right," says Carter.

Soft Factors Are Key

Soft factors, in other words cultural and personal assimilation, are key throughout the integration process. In many cases, the managing partners leave the

company after the handover. The owners are often about to retire and want to know that their company will be in good hands. They want their company to have favorable prospects for further growth, even if it is located slightly outside of major industrial regions. "An important factor for many people is that the company they founded will benefit from being part of a world-leading corporate group such as Röchling. This approach suits us as a family company," says Carter. For all acquisitions, Röchling aims to keep the rest of the leadership team on board so that the management of the company stays in experienced hands. "We do not have enough people at Röchling who could just step into these roles at short notice," says Brunswicker.

At the time of the acquisition, Röchling will have already devised a plan for the new company. For example, it will have already established what areas require investment and which synergies will be exploited. "If it ain't broke, don't fix it. But if we think the company would benefit from a new approach, we adapt things," explains Brunswicker. There are areas that Röchling is not willing to compromise on – the acquired company has to adapt. "We are a group with sales of over two billion euros. Our annual

accounts have to be ready by 31 January, for instance. But we support the new company through these changes," says Brunswicker. Röchling introduces specific guidelines for various areas, for example in reporting. It also immediately establishes lines of contact between production managers within the group in order to identify synergies in greater detail. "We never want to come across as know-it-alls. We always express how happy we are to have gained a new family member, that we value the new company and its employees, and that we will strive for a joint and prosperous future," says Brunswicker.

A "post-merger audit" then takes place after a few years. A checklist is used to assess whether everything has gone according to plan. This includes not least of all the question of whether Röchling customers around the world are actually benefiting from the growing global corporate network. "A checklist helps because you learn something new every time," says Carter. "Every merger is similar, but no two are the same."

Acquisitions in the Medical Division

— 2018

Precision Medical Products, Inc.
Denver, Pennsylvania/USA

FRANK plastic AG
Waldachtal, Germany

— 2015

HPT Hochwertige Pharmatechnik
GmbH & Co. KG
Neuhaus am Rennweg, Germany

— 2012

Advent Tool & Mold Inc.
Rochester, New York/USA

— 2008

Oertl Kunststofftechnik
Brensbach, Germany

Courage to Embark on Vigorous Change

In 2018, artist Ottmar Hörl designed 100 figures of steelworkers for the Völklinger Hütte World Heritage Site, Germany, as part of the sculpture project "Second Life." The ironworks were owned by the Röchling family for almost 100 years.





“Cautious bravado paired with a great deal of assertiveness” – this is how Charlotte Sophie Röchling described her young son Carl in a letter in the middle of the 19th century. Before long, shortly before his 30th birthday in fact, Carl Röchling was running the company together with his brothers Theodor, Ernst, and Fritz, and he soon became known as “Carl the Bold.” The Röchling brothers, nephews of the company founder, epitomize what makes family entrepreneurs successful: they ensure the continuing success of their companies with entrepreneurial spirit, a strategy of intelligent risk assessment, and long-term thinking. Future sustainability is always a top priority for them.

Especially family companies that span generations are often pioneers in their field. This was certainly the case for the coal trading company founded by Friedrich Ludwig Röchling in Völklingen, Germany, in 1822, which has evolved into a global plastics group in just under two centuries. It didn't take long for the company founder to open up new sales territories beyond Saarbrücken – down the Mosel into the Koblenz area, across the Rhine to Frankfurt. Lorraine was another important market. Even back then, Röchling went beyond narrow geographic boundaries, recognized the signs of the times, and successfully positioned itself in new regions after weighing up all the risks. This is a tradition that has consistently continued up to the present day.

The Röchling motto: conquer new markets and regions with innovative materials and courageously take advantage of the opportunities that they offer. The coal trade acted as a basis for the Röchlings and gave them an insight into the rising innovation leader of the industrial revolution: steel. This marks the second major chapter in the Röchling story. The four nephews of the company founder, the Röchling brothers, started with coke production and industrial iron processing in 1849. The company's entry into the

steel era can be traced back to its acquisition of the Völklinger Ironworks in 1881, which a century later would become the world's first industrial UNESCO World Heritage Site.

The first half of the 20th century was dominated by the two world wars, which also had severe consequences for Röchling: the political isolation of Germany, the seizure of the corporate property, expropriations, as well as poor economic conditions plunged the company into a serious crisis. In uncertain times such as these, when the world is changing around you, you cannot simply continue to run a company as you did before. You need the courage to undergo a transition. Röchling proved it had what it takes: By 1920, almost 100 years after the company

The Privy Councillor of Commerce Carl Röchling (1827–1910), popularly known as “Carl the Bold,” managed the company together with his brothers for many decades. This large painting hangs in the headquarters of the parent company of the Röchling Group in Mannheim.



was founded, the potential of a new material was being uncovered and the company became a pioneer in plastics processing. The aim was to lessen its reliance on steel. By this time, the third generation of Röchlings was already making its mark on the company. This generation was also able to identify major opportunities and had the courage to take them. They were open to using new processes in the Röchling plants, created groundbreaking technical innovations, and made significant contributions to developments in the industry.

Investments Outside of Saarland

To safeguard the family business, the Röchling family decided to look for further investment opportunities alongside plastic outside of Saarland at the beginning of the 1950s. In 1956, a majority stake in Rheinmetall AG, a supplier of the newly founded German Armed Forces (Bundeswehr), was acquired from the German Federal Government and it has remained part of the family's estate for almost 50 years. The global steel crisis, which resulted in a worrying downturn and considerable losses at Röchling, ultimately led the family to fundamentally rethink the company's strategy. In 1978, Röchling and the Völklinger Hütte finally parted ways and Röchling said goodbye to the coal and steel industry and the industrial homeland, Saarland. This step showed that letting go is just as important as holding on in courageous and forward-looking company management.

This marks the start of the third phase in the company's history: the beginning of the conversion into a conglomerate and ventures into new business fields. Its presence in various markets with high-quality products was intended to protect the company from the effects of economic fluctuations. In addition to its entry into various new sectors, the company started to continuously enhance its existing material expertise on high-performance plastics from 1982 onwards. This business continued to grow throughout the 1980s through numerous acquisitions in Germany, Austria, Italy, the USA, and activities in Singapore and later in China.

At the end of the diversification phase, the Röchling Group was operating in widely differing areas: in addition to plastics processing, these included communications technology, energy and process automation, measurement and control technology, steel processing, transmission development, mechanical engineering, and automotive and defense technology. For the Röchling Group, the complexity of a conglomerate turned out to be the wrong route to go down. In this situation, the family once again demonstrated the strength and the courage to embark on vigorous change – Röchling refocused on its traditional forte of materials expertise, and in 2001, the transformation of the conglomerate into a specialized international plastics group commenced. By 2006, it had severed itself from all holdings that weren't related to plastic.

Targeted Acquisitions in New Markets

Since the turn of the millennium, what remained of the new and specialized Röchling plastics group has relied primarily on internal growth by diversifying its existing expertise into a wide variety of new sectors, as well as targeted acquisitions in new markets, such as automotive plastics and medical technology since 2008. It has also been strongly establishing its presence in international markets, particularly in Asia and the USA. This has brought the group's unique material and processing expertise, which it has developed over the course of two centuries, back to the center of its activities.

Plastic products from Röchling are innovation leaders in all industries in the 21st century – just like the applications made from Röchling steel two centuries earlier. The Röchling Group is now the world's leading processor of high-performance technical plastics in almost all sectors of the capital goods industry, in the automotive industry, and in medical technology.

The Röchling Family – Continuity in Change

Responsible, committed to long-term and sustainable success, value-oriented, and willing to take a risk when the time is right: these characteristics determine the way this family-led company thinks and acts. They also characterize the Röchling family. The family can be traced back to the 17th century, and the family members now form the eighth generation of company

shareholders. The Röchlings have always seen themselves as “family entrepreneurs.” It didn’t matter if they were managing the operations of the company themselves or – as is the case today – setting the strategic course of the international group through the Advisory Boards.

For almost two centuries, the family has closely accompanied their company on its eventful journey from a steel producer to a global plastics group. They have shown continuity and courage in the face of change, in both good and difficult times – and this has helped them to ensure the long-term preservation and success of the Röchling Group.

Röchling Enkel Award

As a family-owned company, Röchling attaches great importance to preparing for the future. This is why we created the Röchling Enkel Award, which focuses on the shared framework of values of the group and of the Röchling family. It is used to recognize the particular dedication and exemplary and bold projects of Röchling employees that aim to bolster the company’s long-term future.

For Röchling, it is important not only to be financially successful, but also to act with a sense of responsibility to society. Such behavior demonstrated by our employees both in the workplace and beyond will be honored

accordingly with the Enkel Award. It recognizes outstanding performance that benefits the entire company in the long term, transcending the boundaries of locations and divisions.

“It is not only our own short-term interests that count, but also the long-term prosperity of the global Röchling Group, and therefore that of subsequent generations of employees and shareholders,” says Johannes Freiherr von Salmuth, Chairman of the Advisory Boards and a sixth-generation family member. The company’s long family history is precisely the reason why the award was named the “Enkel Award” – the “Grandchildren Award”.

“Röchling is a very exciting environment for innovations”

Klaus-Peter Fett, Chief Information and Digital Officer (CIDO) of the Röchling Group explains in this interview what differentiates the digital transformation from the other changes that the Röchling Group has already successfully undergone over the course of its almost 200-year company history – and what opportunities it can offer the company.





“With the cloud, there is suddenly a whole universe of technical possibilities and resources available to me.” CIDO Klaus-Peter Fett tightly grasps hold of these opportunities – as well as taking advantage of the creative room at the Röchling Group in Mannheim, Germany.



Mr. Fett, you joined Röchling last year and before then you spent many years at Google. Is there anything in particular that you have carried over from your previous company?

Open-ended questioning. At Google, we were constantly questioning our business model. Which products and services will help my customers develop? What will my customers be able to use and apply in practice? Of course, Röchling isn't a software company or an application provider, but we are an outstanding plastics processor that solves problems for its customers. With this in mind, we still need to continuously ask ourselves what our customers truly expect. And of course, whether and how these expectations may change in the future. As CIDO, it is my job to develop and monitor a long-term strategy that addresses these questions.

“There needs to be an atmosphere at the company that encourages innovation. You need to approach new ideas with an open mind, but these ideas also need to be challenged.”

So the focus is on the customer. Does this strong concentration on customer needs result in Röchling only being as innovative as its customers?

Lots of our customers are true pioneers. We work with them very closely and develop new ideas together. This process requires a high degree of networking, integration, and trust. We weigh in a lot during preliminary work, even if it takes a long time. A good

example of this is our Automotive division. When there is an idea for a new car, we are talking about a planning period of several years. This is because its issues such as weight, aerodynamics, strength, fire resistance, acoustics, safety, and so much more need to be scrutinized. We launch an entire research and development process to ensure that the best products are manufactured at the end of it. It doesn't get much more innovative than that.

Do these long engineering phases – to use the language of digitalization – not need to become more agile in order to react more quickly to changing requirements?

Definitely. Significantly faster and alternatively structured development cycles will be necessary in the future. And the developments themselves will be even more platform-based or even modular. Our ambition and our aim is to develop entire systems that make this possible, from the idea to a product and then to its implementation. This is only possible with the digital transformation.

What exactly does the digital transformation mean to you?

There are two major components: the digital marketplace and the digital workplace. The digital marketplace is not just about sales models, websites, or online shops. It also includes products, collaboration with the customer, networked production, sales – everything that is geared towards the ultimate corporate objective: offering the customer products and services that they are desperate to utilize in their products.

And the digital workplace?

This is the more difficult aspect for many companies. This is about the culture that a company promotes. A culture of openness, transparency, and clear communication. A culture that encourages close collaboration and addresses mistakes with a positive outlook. The innovative capacity of a company relies heavily on its culture.

What do you mean by that?

Take the Silicon Valley. When someone comes up with a new idea, everyone says “Yes, and” – not “Yes, but.” The attitude itself already changes my approach to innovations. A positive error culture is also essential. If someone makes a mistake, it is still a result – provided it is discussed openly at any rate. As an organization we can learn and ultimately benefit from mistakes. It is important that we actively incorporate this culture. There needs to be an atmosphere at the company that encourages innovation. You need to approach new ideas with an open mind, but these ideas also need to be challenged. What do I need that for? What might the end result look like? What impact will my idea have on the company? These questions are of course different to saying: “Yes, but we’ve never done something like this before.”

Where does Röchling stand here?

Change, reinventing itself, this is part of the Röchling DNA. Most employees have been with the company for a long time, are closely tied to the organization, and as such are intrinsically open to change and innovation. I am very impressed by the openness of the people at Röchling. This is an excellent place to start from when it comes to intensifying collaboration. Bringing the various departments within the Röchling Group closer together is one of the most important objectives of our digital transformation. Collaboration will be more important to the success of our group than perhaps we initially thought.

How do you proceed?

We start by figuring out when employees acknowledge that they need others in order to achieve the best possible results from their work. As the organizer, it is then my responsibility to ensure that the employee can make this “need” clear to those around them and that they have the freedom to set up a project or participate in one that may already exist. It is essential that all relevant information and documents are shared company-wide. Employees need to know what expertise is available to them in the company and what

“Of course, it takes a certain amount of courage to confront the digital transformation of our company. Bringing the various departments within the Röchling Group closer together is one of the most important objectives. Collaboration will be more important to the success of our group than perhaps we initially thought.”



“Change, reinventing itself, this is part of the Röchling DNA. Most employees have been with the company for a long time, are closely tied to the organization, and as such are intrinsically open to change and innovation. I am very impressed by the openness of the people at Röchling.”



department they can reach out to for certain issues. However, as I said, collaboration is not just a question of methodology, organization, and tools, but also of mindset.

Collaboration and knowledge management are not really anything new. What is different about them today?

Several things are different. Collaboration today directly results in more agile working, and this enables us to set new ideas in motion faster. Ten years ago, real-time collaboration on a platform wasn't possible. Today, there are cloud-based solutions that allow dozens of people to work on a single document. The technology has changed beyond recognition. And, most importantly, in the cloud, I only pay for the resource and the time that I actually use. There is suddenly a whole universe of technical possibilities and resources available to me.

How are you managing to integrate these planned changes into the organization? How can you take a courageous leap that won't overwhelm the company?

Of course, it takes a certain amount of courage to confront the digital transformation of our company. This is clearly a task for the management team. For one thing, managers have to decide how much manpower, time, resources, and money they invest in different areas. It is not advisable to make changes blindly – that wouldn't be courage, but rather recklessness or even desperation. Managers also have to create an environment where others can be bold. This requires a protected space in which anyone can try out their ideas. Every employee should have the opportunity to participate because everyone is involved in the overall concept.

So it doesn't require a hotbed of innovation?

On the contrary, a company needs a space where employees can see innovation in action. But this space shouldn't appear as being "off-limits" so others think: "Let's just let the nerds get on with it." Instead, I have to involve employees in this transformation for a particular cycle, so they can then take what they have learned and apply it to their department as driving forces, almost like ambassadors. The changes are then internalized, enacted, and represented

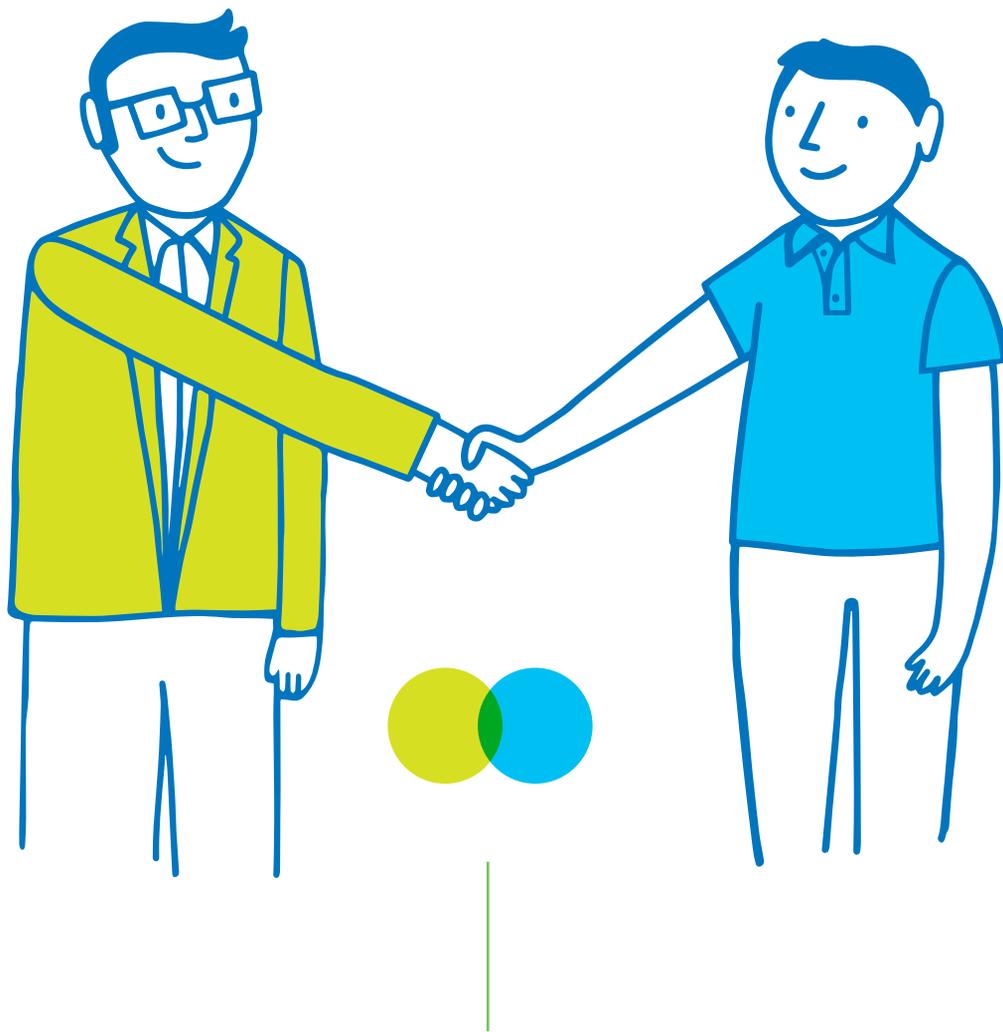
by everyone. This is why I see transformation as more of an evolutionary process, not a revolution. Transformation is only possible when it is being executed down a well-planned and gentle path and it won't happen in a matter of days, weeks, or months, especially in a company that is almost 200 years old and successful like Röchling. Despite its traditional appearance, Röchling is proving to be a very exciting environment for innovation, as it has demonstrated time and time again in the face of change.

“Every employee should have the opportunity to participate because everyone is involved in the overall concept.”

Do innovation initiatives at Röchling have to pay off straight away or do you see innovation as an investment?

As a family-run business, we are accountable. On the other hand, as a family company we also have long-term objectives and projects. This means that we don't have to generate a return within three months, but of course, our investments do need to pay off in the long term. We achieve this, for example, by increasing our efficiency through adjustments to IT and our infrastructure. At the same time, we push forward with a healthy dose of innovation. This is how we make sure that we keep pace with change in all areas and that we continue to develop our pioneering abilities. We will only be able to step boldly into the future by implementing these projects and initiatives.

Trust Makes Us Strong



**In times of major upheaval,
employees want direction –
the management team needs
to step in as a motivator**

In these times of major and extensive change to the world around us, to our country, our employers, and our personal lives, many people feel insecure. People want direction, order, and a certain level of predictability because all of this makes us feel secure and stable.

In this regard, managers in companies are being pulled in all directions – and this is also the case at Röchling. It is their task to be guided by the tried-and-tested, while also having the courage to enact change and forge new pathways with courage and determination. The digital transformation of our corporate group, testing new tools and methods, optimizing internal communication, helping employees evolve so they can join us on this journey – these are some of the challenges the Röchling Group is facing today.

The task of inspiring courage in employees falls to the managers. Courage will help them to overcome possible anxieties and reservations towards change, build confidence, and encourage them to try new things. How can we achieve this? By explaining the

need for change as openly and transparently as possible, by reporting on projects as well as their progress and setbacks, and by listening to employees, asking questions, and taking their concerns seriously.

It is the job of HR managers to take various measures to inspire confidence in all employees at the company, at all levels and in all roles: confidence in themselves, in their company, and in their future at Röchling.

Over the following pages, we will be introducing you to two Röchling employees. They are examples of the many ways that courage and a willingness to try something new can pay off – in both our professional and personal lives.



The World Belongs to Those Who Dare

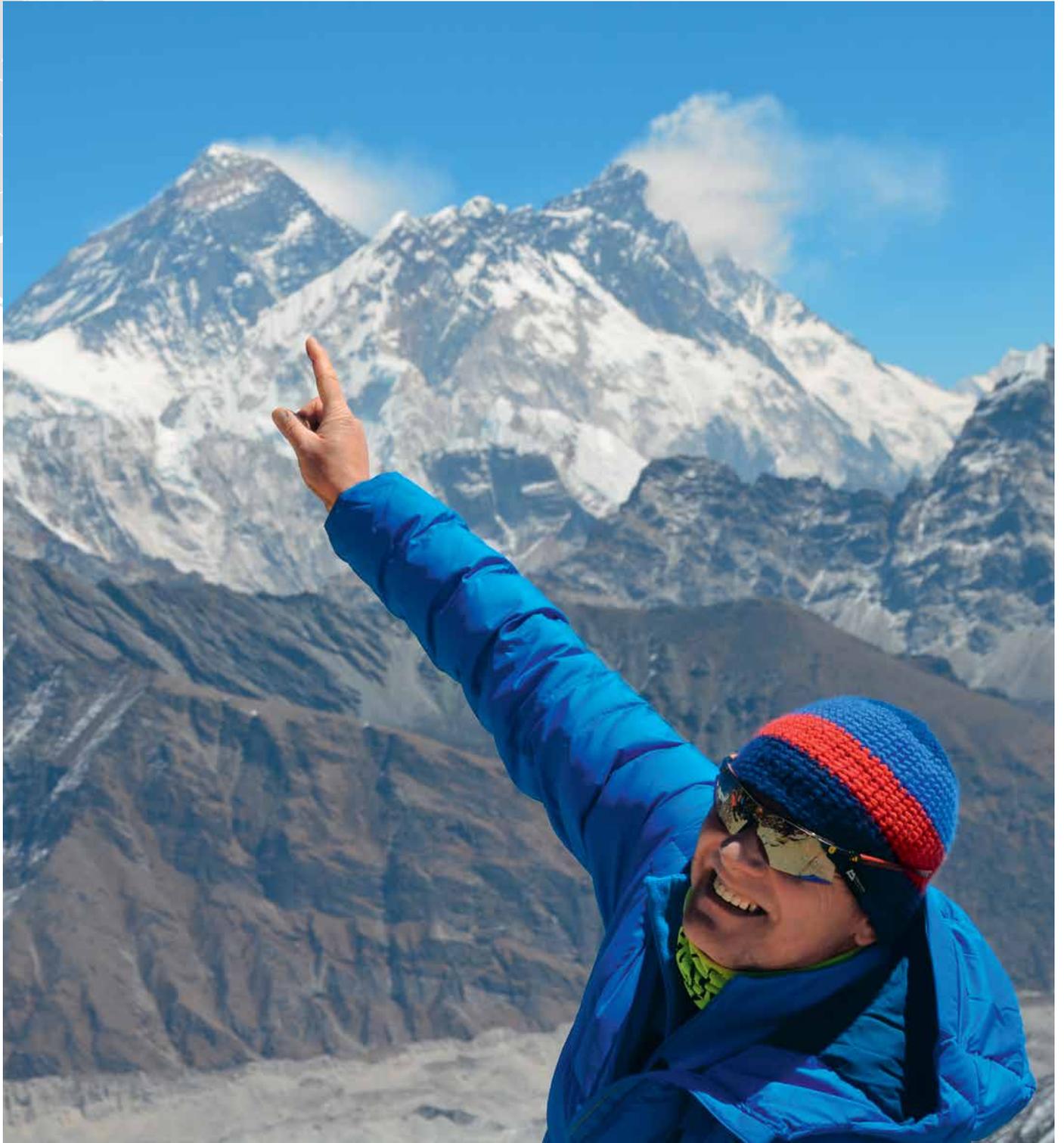
**Henry Klett from Röchling
Medical Neuhaus, Germany,
discovers his personal limits
on a tour of the Himalayas**



CHINA

LAOS

THAILAND



The mountains show you how much you can achieve: Henry Klett was pushed to his limits on his trekking tour at the foot of Mount Everest.

Fitness goals achieved, climbing training completed, shoes broken in, sleeping bag tested, successful meeting with the mountain guide, route planned: Henry Klett and his wife spent twelve months meticulously preparing for their four-week trekking tour through the Himalayas. A calculated adventure, tackled with courage and determination.

Henry Klett has always been sporty. He grew up with skis on his feet in the snowy Thuringian forest, Germany. The biathlon race was and still is very dear to his heart. After training to be a chef, Klett worked for many years as a full-time cross-country skiing trainer of the junior team in the former German Democratic Republic (GDR). He successfully trained GDR champions and was also one himself. After reunification, Klett initially worked as a ventilation fitter and then came to Röchling Medical Neuhaus, Germany, as a metalworker for a subcontractor. Three years ago, he was offered the opportunity of joining the Röchling Medical procurement department. The 59-year-old

jumped at the chance. Together with one other colleague, he now runs the warehouse, taking care of goods receipt, goods issue, and orders.

This means he spends half the day sitting at his computer. So of course, the sports enthusiast needs to make up for this outside of work – with his racing bike, the gym, and cross-country skiing. Klett also takes part in competitions, such as the Engadin Skimarathon. The mountains in the Eastern Alps of Switzerland, topped off by the 4,000-meter-high Piz Bernina, are not to be scoffed at. But it has been Henry Klett's dream for many years to see the highest peaks in the world. This dream became true in 2018 after a year of strict training.

In March, he flew from Leipzig to Kathmandu, and from there he traveled by bus for ten hours over dirt roads to Jiri in the Nepalese Himalayas. The following 25 days solely consisted of walking – from subtropical temperatures of over 30 degrees Celsius down to minus degrees in the high mountains, 350 kilometers, 25,000 meters in altitude. The little group slowly made their journey to the foot of Mount Everest, the highest mountain in the world. They slept in lodges overnight. Everyone spent the evening huddled around the only stove: warming up, drying clothes, cooking food. A bottle of hot water and a hat were essentials when the group finally retired to their wooden beds and sleeping bags in the unheated bedrooms. Light, warm water, electricity – comforts from another world.

The Nepalese Porters Were Always the First to Arrive

Klett was very impressed by the Nepalese porters, who tied the luggage of the mountaineers onto their backs every morning and always arrived at the daily destination before everyone else, despite their sparse clothing, with some even wearing flip flops. “People get by with the absolute minimum of what we consider standard in our lives. But they are always friendly, always have a smile on their faces.”

After a day of acclimatization at 4,300 meters, the climb to the 5,350-meter-high Khumbu Pass

began. Covering an elevation of more than 1,000 meters in ice, snow, and cold is no small matter. “You stop talking. With every breath, you ask yourself what on earth you are doing up there,” says Klett. Even for extremely well-trained modern hikers, like Klett and his wife, the trekking tour pushes you to your limits. The German guide, a seasoned mountaineer, who the Kletts met on several occasions in preparation for the trip, ensured they got the calmness and confidence they needed. When there is a steep drop down to your left and right, you need to stay level-headed and absolutely focused, even when you feel exhausted. You can’t afford to be scared, but you shouldn’t take any silly risks either. “The tour taught us a lot about our limits, and it maybe even broadened them slightly. The mountains showed us how much we can achieve,” explains Klett. Their efforts paid off every day with spectacular views and breathtaking moments.

You need to be extremely lucky with the weather if you want to see the sunset on Mount Everest. After spending the night at the highest lodge on the trekking tour at 5,200 meters, in the thin air

and freezing cold, the group set out in the afternoon. Two and a half hours later they were standing 450 meters higher on Kala Patthar, one of the most popular trekking peaks in the Himalayas. They were lucky to be in the right place at the right time: snow-capped, towering mountains bathed in the red light of the setting sun. They returned to the lodge in the dark, exhausted, short of breath, and with weak knees. “This descent required everything the mind and body could muster,” recalls Klett.

Over the next five days, the group descended to the mountain village of Lukla at an altitude of 2,600 meters. The final leg of the journey involved a 50-year-old Dornier aircraft taking off from the incredibly short runway in Lukla. The passengers glided down to Kathmandu safe and sound with amazing views over the foothills of the Himalayas. An unforgettable end to an unforgettable journey. “It exceeded all of my expectations,” says Klett. The world belongs to those who dare.





Henry Klett covered an elevation of 25,000 meters and a distance of 350 kilometers on his trekking tour in the Himalayas. This included a walk over the Hillary Bridge (photo below), named after Sir Edmund Hillary, the first climber of Mount Everest.



**“You stop talking.
With every breath, you ask
yourself what on earth
you are doing up there.”**

Henry Klett, employee from Röchling Medical in Neuhaus



Roudy Rasoul is training to become an industrial management assistant at Röchling Industrial in Haren, Germany. He says: "I look forward to being able to go to work every morning."



الذي أتوق إليه



Fearless in the Face of the Unknown

Syrian Roudy Rasoul
came to Germany after
fleeing his home country
and now he is completing
training at Röchling

ألمانيا هو البلد

“Germany is my idea of a perfect country”

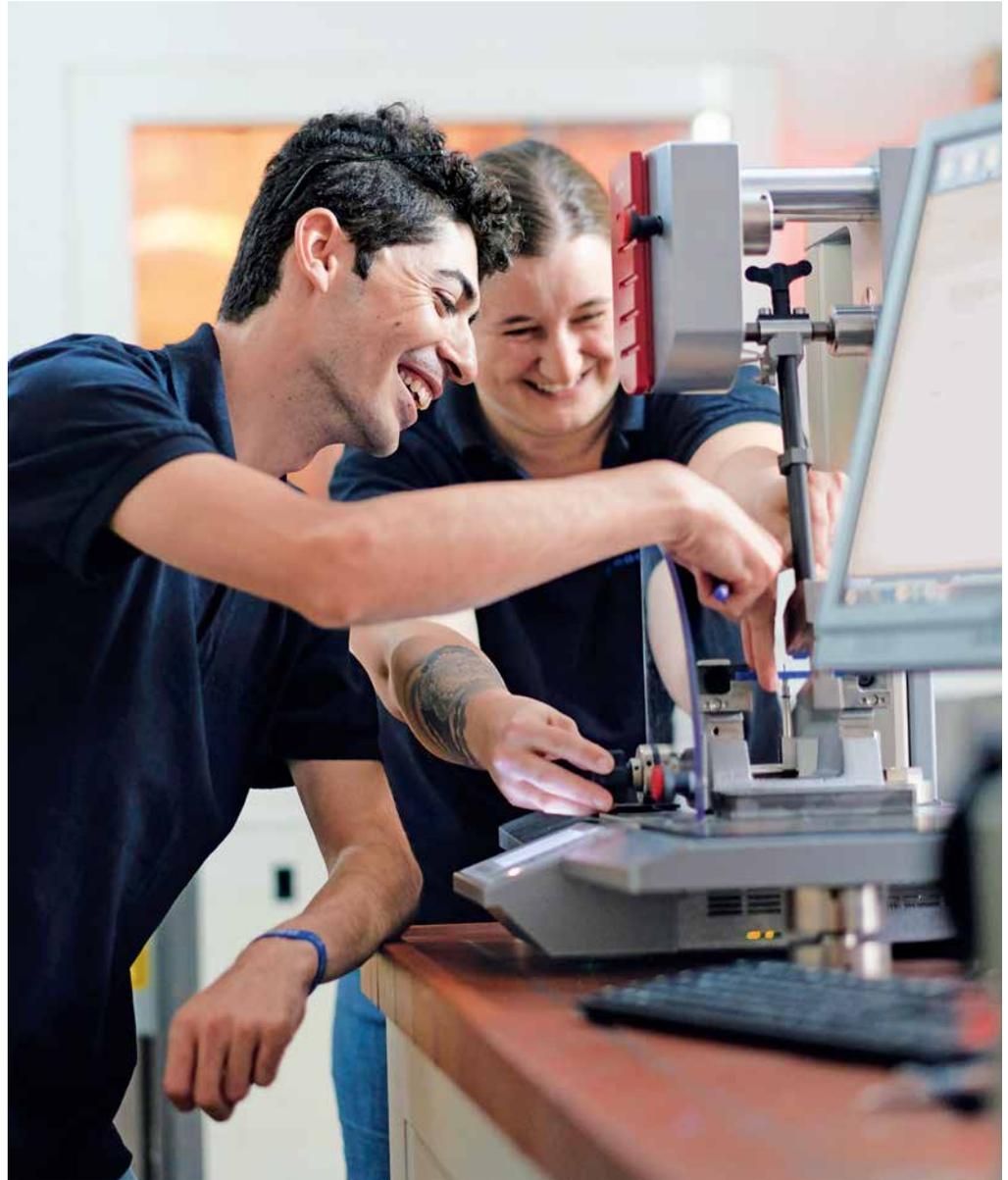
Years of war, fearing for his life, terrible economic prospects – just like many other Syrian refugees, Roudy Rasoul eventually decided to turn his back on his home country. Not an easy decision to make. It took a lot of courage to leave everything he knew behind. Not only was the actual escape from the country full of uncertainties, his new life was also full of unknowns.

Germany was Rasoul's idea of a perfect country long before the outbreak of the war. "Made in Germany" has particular resonance in Syria and Rasoul is fascinated by the topic of product quality. He first came up with the idea of visiting Germany ten years ago – a simple enough plan. But then the war came, and the young man was among those who wanted to leave the country as soon as possible. Despite childhood memories, despite his education, despite his sociology studies, despite his parents and siblings.

Rasoul was born in north-east Syria and has Kurdish roots. Before he decided to flee, he lived in the autonomous Kurdistan region in northern Iraq. There is no single, internationally recognized Kurdish state. The settlement area known as Kurdistan covers Syria, Turkey, Iran, and Iraq. The Kurds are a minority in all of these countries. This has affected the lives of these people and still does today.

Rasoul's journey to Europe consisted of numerous stages. He met three young men, including his sister's husband, on the Aegean coast in western Turkey and they planned to flee together. They tried to make the journey of six nautical miles to the Greek island of Lesbos four times without success. Either the boat was broken, the wind changed direction, or the refugees were caught by a police boat. "On the fifth attempt, I didn't care anymore. I didn't even wear a life jacket this time," says Rasoul, who cannot swim.

When they reached Lesbos, the small group went to a refugee home – along with the approximately 1,000 other people who at that time found themselves stranded on the Greek island every day. After registering with the police, the young men took a ferry to Athens, Greece. From here they took a train to Macedonia and traveled through Serbia on foot.



Those completing commercial training at Röchling still need to understand the technical aspects of the business: the laboratory is primarily used for testing the materials.

They spent several nights in the pouring rain without a roof over their heads before finally reaching the Hungarian border. A taxi took them to Passau in Germany. 25 August 2015 – a date that Rasoul will never forget.

After several months in a refugee center in Bramsche, he arrived in Haren, where he lived in one room with six other people. It was around this time that Röchling in Haren came up with idea of helping young refugees. However, after an initial meeting between Röchling officials, city representatives, and a group of refugees in the town hall, it quickly becomes apparent that the language barrier would be a huge obstacle. “Roudy Rasoul already stood out to us back then because he seemed so bright and interested. But without any knowledge of German, dual training wasn’t an option,” says Guido van Zoest, Manager Human Resources Development Industrial Division.

In May 2017 – after several successful German courses – the situation was much more promising. “We were able to offer four young refugees an internship. Two of them later started training courses with us,” reports van Zoest. Rasoul is in the process of completing his training to become an industrial management assistant and has made a lot of German acquaintances through his work. “When I walk through Haren, I meet people I know on the street,” explains the 29-year-old. Renate Telgenkämper, Training Human Resources Representative at Röchling in Haren, is impressed by how the Röchling employees welcomed the two trainees right from the start. “Our colleagues are open, helpful, obliging, and kind,” says Telgenkämper – and Rasoul echoes her praise. The newcomer was even invited along to people’s private parties. All of this made settling in much easier for him: “I have experienced a lot of human kindness and openness, and I haven’t had any negative experiences so far.” Rasoul has been feeling particularly at home since he got his own apartment in Haren. He also recently passed his German driving test with zero faults.

Rasoul is one of 53 young people currently completing their training at the Röchling site in Haren and is now in his second year. The company is very committed to providing training and also brings in external support when the refugees struggle with certain aspects of the syllabus. The training is not a sure-fire success, but Röchling and Rasoul both have the common goal of completing it successfully. “Roudy is ambitious. This means he has good prospects,” says the Human Resources Representative.

Great Interest in the Company History

“I am extremely grateful for everything that Röchling has done for me,” says the trainee. Just as Germany is the best country in the world in his eyes, Röchling is the best company. He looks forward to being able to go to work every morning. He is extremely interested in the 200-year history of the family company and reads everything about it that he can get his hands on. He plans to visit the Völklinger Hütte World Heritage Site in Saarland, Germany, one day. The decommissioned steelworks was owned by Röchling for almost 100 years.

Roudy Rasoul can get on board with the vast majority of things in Germany: he enjoys going to German shooting festivals, likes roulades, thinks the weather is “okay,” and can relate to people’s attitude towards work. “Work is very important in Germany, which is something I definitely identify with. It gives you better prospects for the future.” The only thing that bothers him is the bureaucracy. An application needs to be submitted for everything and you have to wait months for a response. He has a clear stance on this: “A lot of it is unnecessary and incurs avoidable costs.” He is definitely not the only person in Germany to think so, which proves that integration has been a success!



Roudy Rasoul has settled in well in Germany and at Röchling Industrial in Haren. He plays foosball with his colleagues during his lunch break – on a table made from Röchling plastic.

Uncharted Territory

**Students from non-academic
families need courage –
and tailored assistance**



Can Canatti is sure that he wouldn't still be studying today without his tandem grant financed by the Röchling Foundation.

It almost seems like a fact of life that children of non-academic parents will have fewer opportunities at German universities. And the figures show that while 79 in every 100 children from families of academics take up a place at a university, only 27 percent of children from non-academic families do the same. Going down a different route to your parents, breaking the mold, overcoming stigmas – this takes more than intelligence and talent. It takes courage.

Can Canatti has proved this. This young man with Turkish roots is studying mechatronics in Hanover, Germany. He looks back on his rocky start, the lack of support from his family when he moved to a new city, and financial problems that resulted in him spending more time at his job in a fast food restaurant than in the lecture hall. He found help with the tandem program from the Deutsche Universitätsstiftung (German University Foundation). Tandem grants enable students like Can to get the personal support they need from university professors when times are hard. They are assigned a lecturer as a mentor. There are also seminars and workshops about learning and self-management, for example.

Can Canatti is certain that: "Without the tandem grant, I wouldn't still be studying today. The expert support from my mentor has really enriched my studies. But what sometimes seemed even more important was that my mentor could give me good advice and opened the right doors. He helped me to harmonize my studies and my livelihood."

"Courage should not only be rewarded, it also deserves effective support," says Michael Röchling. He is a member of the Board of Trustees of the Röchling Foundation and is responsible for the cooperation with the Deutsche Universitätsstiftung as the project sponsor. The Röchling Foundation financed the tandem grant for Can Canatti and supported several other grant holders. The partnership between the Foundation and the companies of the Röchling Group means it can also offer internship opportunities.



An inspirational group: members of the Board of Trustees of the Röchling Foundation together with the grant holders.

In another program called “Welcome,” the Deutsche Universitätsstiftung opens the door to education for young refugees and helps them throughout their studies. The Röchling Foundation also supports this initiative.

Can took a major step when he decided to continue into higher education. It involved him entering uncharted territory, navigating his way through a jungle, trying to gain a foothold, and surviving. Now he is able to think about what he wants to do next. After completing his Bachelor’s and Master’s degrees, he wants to set up his own business. “I work a lot with my 3D printer at home. I’m fascinated by automation and robotics,” says Can, taking an optimistic view of the future. Courage pays off.



Michael Röchling,
Member of the Board of Trustees of the Röchling
Foundation and Project Sponsor

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A photograph of Erwin Doll, Vice-Chairman, standing on a mossy rock overlooking a vast forest valley. He is wearing a blue puffer jacket and blue jeans. The background shows a dense forest of green trees, with a valley floor visible in the distance under a soft, hazy sky. The scene is framed by tree branches with some autumn-colored leaves in the foreground.

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