

Röchling

You Can



Rely on It

Röchling Group
2019/2020

Dear Sir or Madam:

We live in turbulent, volatile and complex times of crisis that constantly require us to change our way of thinking, on an almost daily basis. But has not every period of history brought with it challenging and complex economic and social changes? Has not every era been marked by radical upheaval? What makes today any different to what we have seen before?

The main difference lies in the extraordinary speed at which these changes are currently taking place. Companies that want to succeed on the market need to react to changing market requirements immediately – ideally faster than their competitors. They have to develop new strategies, systems, structures, products, and solutions at much shorter intervals than they did in the past.

This is why the Röchling Group has repositioned itself, so that it can respond quickly and flexibly. As part of this repositioning, we entrust our employees* with important tasks involving a high degree of responsibility. We have established the conditions they need to be able to weigh up risks and opportunities independently and come to their own decisions.

Our corporate culture provides the framework for this decision-making process. We have a set of values that we have constantly reviewed and refined where necessary as our company has evolved. Pioneering, excellent and reliable – these are the values upon which we base our actions, enabling us to overcome the current period of upheaval. The Röchling family company has frequently demonstrated the way in which it manages change during its history spanning almost two hundred years.

A corporate culture and principle of leadership like this requires one thing above all else: trust. We embody this sense of trust every day, based on our honest conviction, and

*For reasons of legibility, the text may not distinguish between genders. All genders are addressed equally in all formulations – unless the context clearly implies a different interpretation.



Mutual trust creates a feeling of security: as they ascend the climbing wall, the Röchling Executive Board – Evelyn Thome, Professor Hanns-Peter Knaebel and Franz Lübbers (below) – can rely not only on their ropes, but also on their team.



Franz Lübbers, Evelyn Thome and Hanns-Peter Knaebel (from left to right) regard trust as a principle of leadership and also count on reliability in customer relations.

not because it is something we have seen in management handbooks. We aspire to create a company environment where our employees feel secure and where they feel confident that they will not be labeled as incompetent, counterproductive or difficult if they ask questions, express criticism or put forward a different opinion. This requires communication and a healthy dose of interaction. For example, we have established internal company-wide platforms to facilitate uncomplicated and direct dialog that is free from hierarchies. These are already actively used within our company.

It is also important for us to develop trusting partnerships with our customers. This involves listening to them and making the challenges faced by our customers our own. This creates a stronger sense of mutual trust, which we are keen to maintain on an honest, long-term and sustainable basis. Our customers are pioneers, constantly pushing the limits of what is industrially possible – and they can count on the excellent and reliable quality of our products and solutions in this process. We will continue to develop our technological capabilities alongside this. This customer focus is nothing new for Röchling, but we have reached new dimensions in terms of our resolute focus on our customers' needs and placing them at the center of what we do.

The situation in the plastics industry is pretty tough at present. It is our mission to strategically position the Röchling Group to ensure a successful future. We will be faced with particular challenges in this process, as will our customers in the Industrial, Automotive, and Medical divisions, since plastic has become such a hot topic in the eyes of the public. Plastic packaging waste pollutes our countrysides and oceans, and many people are justifiably concerned by this. Even though the plastics for technical applications that our company processes have nothing at all to do with this plastic waste, we see it as our duty to help develop solutions. We are aware of our social and ecological responsibility. Plastic will nonetheless be the prime material of the 21st century. However, as a plastics company, we will only continue to succeed if we use this material efficiently and sustainably. And that means recycling, engaging in a circular economy and achieving CO₂-neutral production. Our customers rely on us to provide them with innovative and sustainable solutions and to support them with these solutions in the future – just like we have done in the past.

“You can rely on it” – the Röchling Group’s image brochure highlights the importance of security and trust from a range of perspectives. Trust is a valuable commodity that needs to be handled responsibly. And we are very much aware of this.

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



Prof. Dr. Hanns-Peter Knaebel
President & CEO



Franz Lübbers
Executive Board



Evelyn Thome
Executive Board

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**“For me,
mistrust sucks
the energy
out of people”**

**An interview with Röchling CEO
Professor Hanns-Peter Knaebel
about the importance of trust and
security in customer relationships
and in everyday working life**



Professor Knaebel, “a healthy dose of mistrust never hurt anyone” – can you get on board with this statement personally, or is mistrust an alien concept to you?

Mistrust is indeed an alien concept to me. I place my trust in anyone I meet. That might sound a bit naive, but it's the motto I live my life by, and it's served me very well for over 50 years now. In my opinion, being able to trust people is an important quality, both at work and in one's own personal life. I know, of course, that trust can also be betrayed. But is that a reason for me to mistrust everyone? I find trying to maintain a basic sense of mistrust tiring and it drains all my energy. For me, mistrust kind of sucks the energy out of people. That's why I see trust as the better option.

Anyone who places their trust in others is taking a risk, because it may well be that they are being lied to or deceived. Why do you still think it's worth placing your trust in others despite this?

People can sense when they are trusted and this tends to motivate them more because they don't want to betray this trust. Of course, there are individuals who abuse this trust too. But people can sense that, and they shouldn't be afraid to act accordingly. On the other hand, if you establish a basis of mutual trust, this generates an unbelievable amount of energy, creativity, and inventive drive.

How important is trust in customer relationships?

A customer relationship is based on reciprocal promises, and this relationship works best when both sides get a sense that these promises are being kept. We refer to this as “reliable” in our set of values here at Röchling. Reliability is an important characteristic that sets us apart, which we strive to achieve on a daily basis. Our customers help us in this process, because they let us know when we're not fully living up to this reliability.

How does a company gain trust – both from its employees and from its customers? What has your own experience been of this?

Take the following example – the best answer you can give to a person who has asked for something is “Yes”, followed by concrete action to fulfill their request. The second best solution is “No”, but

“When you establish a basis of mutual trust, this generates an unbelievable amount of energy, creativity, and inventive drive.”

only when this is well-founded and the other party understands your reasons. The worst answer you can give is “Yes”, but then not following this up with concrete action, rendering your answer meaningless. This means you need to stick to your promises and commitments and clearly articulate how you see things and what action you are going to take. For me, “say what you do and do what you say” is a key formula for building trust. It guides what I do every single day.

What do Röchling customers want to be able to rely upon?

Are there any differences between the three divisions?

Our customers are faced with challenges every day, and sometimes even problems. When we offer to help them respond to these challenges and resolve problems, this means we have entered into an important agreement. Working together to derive benefit is a key mission in all of our divisions.

Are there any areas at present where there is a particularly great need for customer trust?

There are two central themes that are shaking up all sectors of industry at present. The first of these is digital transformation, which is in full swing and affects all divisions and industrial sectors. Although the pace of this transformation may well differ in each sector, they are all heading in exactly the same basic direction, and so we need to find positive ways to respond to this.

“In any relationship, clarity, transparency, and honesty are key to ensuring that you not only retain this mutual trust, but also strengthen it.”

The second key challenge is the transformation process sweeping across the entire industrial landscape. In the Automotive sector, Röchling believes that these considerations go beyond the product itself and encompass all issues relating to future mobility. In the Medical sector, this is a question of how we can generate even greater benefits and safety for patients with products, materials, and technologies. And it's a fairly similar situation in the Industrial sector. Here it's a case of being familiar with all relevant sectors and successfully interacting with customers in order to provide them with the solutions they actually need.

This will be the prevailing theme in all sectors over the next few years – working together to provide solutions that create benefits and generate added value. When the customer knows they can rely on our partnership, when we're not only able to back up these pioneering steps with excellent quality, but also able to help give form to these steps, this is when you create a special kind of trust.

Once you have gained this trust, how can you make sure that you don't lose it again?

In any relationship, clarity, transparency, and honesty are key to ensuring that you not only retain this mutual trust, but also strengthen it. Everyone involved understands that things won't always work perfectly, and there will be challenges along the way.

If you present your customers with a clear and transparent picture of where you're at and how you intend to overcome these challenges, then you won't lose this trust – especially not if you keep your promises. We know from our own experience that customer relationships can go through tricky phases. But we also know how to deal with these phases.

We have to adapt to new situations quickly every day, including in the workplace. How important is it to be able to trust and rely on your colleagues?

There's a great expression for this: to go the extra mile! Each employee should try to always go that bit further for their colleagues or customers, both in customer relationships and when working with other staff members in their workplace. When this works, the entire organization will automatically become more productive. I know, of course, that there are colleagues who might not join in quite as much as others. But there is a big social corrective factor in organizations, and these colleagues will be quickly encouraged by other employees within the organization to get involved. Or they might decide at some point that they don't fit in with this organization anymore. It's a constant give and take, and anyone on the taking end is also very much willing to give.

Is it a manager's job to ensure that members of a team can rely on one another?

A manager's main job is to lead a team according to a clear set of values. Since leadership and collaboration isn't a one-way street and in fact involves a two-way relationship, there needs to be a set of clear and understandable values that apply to all. It's vital that the manager leads by example so that these values are embodied by all members of the team in order to achieve collective success. This ability to rely on one another is closely linked to a set of values and a culture. Here at Röchling, we have redefined our guidelines for leadership and collaboration as part of a two-year process. These form the basis for our actions and our future success.

How important is it to the company's success that employees feel secure in their work environment? If they feel secure, does this help them to take risks sometimes?

If someone never takes any risks, they'll never find out what could have been possible. By staying on familiar ground, they might trick themselves into thinking they're secure and stable, but this isn't a great way to achieve amazing results in the long term – and it tends to be pretty boring too. For me, it's important for employees to feel secure on the one hand, but also to show courage and help propel the organization forward. But this also means that the organization shouldn't penalize the actions of an employee or team without looking at the intention behind these actions first. Otherwise, employees and teams will learn very quickly that courage is not rewarded. Any pioneering activity in the company will grind to a halt and be replaced by complacency. My hope is that employees will act boldly, responsibly-minded, but also creatively, in order to help us move forward together.

Do you feel that people tend to regard anything new with a sense of mistrust at first? Does that make it harder to bring about change in a company?

We are creatures of habit, especially when we consider ourselves to be in a stable environment. Change and anything new upset this balance and create uncertainty, which can in turn generate a sense of fear that paralyzes people. That's why I believe it's vital that managers, and me personally, don't simply stop exposing employees to change and anything new, but that we relieve them of this uncertainty and fear of instability. An organization is constantly in motion – and it needs to be in motion in order to achieve success. Employees who place their own personal trust in the company and their manager and who feel that decisions are being made according to a well-thought-out plan, these are the employees who will really embrace this change. This requires communication at different levels. At Röchling, for example, we have set up new internal communication platforms with the "One" app and Microsoft Yammer.

“For me, it’s important for employees to feel secure on the one hand, but also to show courage and help propel the organization forward.”


We are living in a complex world that is still changing at an astonishing rate. This often creates a feeling of uncertainty. How can decisions be made in light of this?

One thing is perfectly clear: we all make decisions every single day that are subject to a certain amount of uncertainty, because we will never have every bit of information we need to come to a decision with 100 percent certainty. However, it's always more sensible to make a decision, review it regularly, and make adjustments or even correct it where necessary, rather than waiting until things are absolutely certain and then coming to no decision at all. This leads to a complete standstill and heralds the end of an organization. Röchling has been successful for almost 200 years, and its current leadership team has taken office with the aspiration to steer the company towards another 200 years of success.

A portrait of Professor Christian Montag, a man with short, light-colored hair and glasses, wearing a dark blazer over a dark button-down shirt and blue jeans. He is smiling and has his arms crossed. The background is a light-colored wall with a molecular model featuring white, green, and grey spheres connected by rods.

“Trust Is the Glue That Holds Our Society Together”

Professor Christian Montag
on human personality,
genetic causes, environmental
factors and what all of this means
for society and the economy



Molecules are his forte. Professor Christian Montag researches the molecular genetics of personality at Ulm University. For example, is our willingness to trust an inherited trait?

Professor Montag, you spend a lot of your working life dealing with the issue of trust. Let us start with a personal question, if we may. Are you a trusting person? Or are you more circumspect and someone who prefers to be on the safe side?

I tend to give people the benefit of the doubt, and that has usually served me well. Giving people the benefit of the doubt can open doors, and if you have a halfway decent understanding of human nature, the end result is usually a good one. Quite honestly, though, there is no question that you are always taking a certain amount of risk. Trust is a gesture of generosity. Putting your trust in a stranger is a fundamentally courageous act, because it may turn out to be a mistake. In other words, you need to be willing to make an investment.

What is the basis for the human need to be able to trust others?

Our basic need for trust and commitment is an integral part of our genetic make-up, to some extent. The first humans came from the African savanna, and we are gregarious animals. Right from those early days, group cohesion has always been essential for survival, because we are stronger together. That means that trusting other people within my group makes sense from an evolutionary perspective. It is interesting to note that scientific research has indicated that you are most likely to trust someone who looks very similar to you. This is more likely to happen in families and with sharing majorities of the genome.

Yet not all people are equally trusting. Some are gullible; others overcautious. Is that because of different genes or because of environmental factors during your upbringing?

Things like that can be investigated by various means, including studies of twins. One such study shows that up to 20 percent of differences in this sub-aspect of our personalities – that is, in how much we trust – can be attributed to genetic influences. However, please do not mistake genetics for determinism in this case. In the context of psychiatry, that means that not everyone who is genetically predisposed to depression, for example, will actually experience it. The likelihood of depression manifesting itself is at its highest at the confluence of a genetic risk and an unhappy childhood or other negative environmental factors.

So genes and environment go together?

Yes, genes and environment go hand in hand. Which clusters of genes are actually activated in which environmental circumstances is something that is examined by epigenetics, a relatively new field of research that represents an interesting area of science. The fact is that the body calls on the blueprints stored in our personal genes, which it needs to produce physical products such as insulin, only when necessary. The same applies to oxytocin, a neuropeptide. This hormone induces labor before birth, for instance, and reinforces the bond between mother and child. It also promotes

positive social interaction in general, as it appears to be capable of facilitating trust. However, the latter is the subject of intense debate among scientists. Moreover, we are a long way away from being able to boost a person's trust levels simply by administering oxytocin in the form of a nose spray, for example.

Is it possible to say what makes people more likely to trust?

The question here is “Why am I the way I am?” – in other words, it is about our personalities. There have been hundreds of studies into this subject. Personality can essentially be broken down into temperament and character. Those are two different things. Temperament is something that is evident from infancy in things such as whether a child is anxious or more inquisitive. That being the case, it is not so surprising that temperament is subject to significant genetic influence. By contrast, character develops over your lifetime and with your own history of learning. One hypothesis suggests that a person's character does not stabilize in relative terms until the age of 20 on account of the late maturation of the prefrontal cortex in the brain. Yet it is both aspects, temperament and character, that make up our personalities.

So how many personality traits are there?

There are various models and theories, and I would like to mention two of them. The most widely used personality model is the Five-Factor or OCEAN

model. It is derived from statistical analysis of human vocabulary – that is, the words that we use to characterize other people. These linguistic analyses have identified five personality traits: openness, conscientiousness, agreeableness, extraversion and neuroticism. We all have these traits to specific extents. Conscientiousness, for example, ranges from highly organized people to more “chaotic” types.

And the second theory?

It is based on biology, or psychobiology. Experiments have shown that emotional responses can be triggered in certain areas of the brain if external electrical stimuli or pharmacological substances are administered. This scientific method has identified a total of seven emotional circuits in the brain for positive and negative emotions. Even slight neuro-anatomical differences in these circuits prompt different emotional responses to many everyday situations in different people. These emotions help to shape our personalities.

And whom are people especially likely to trust?

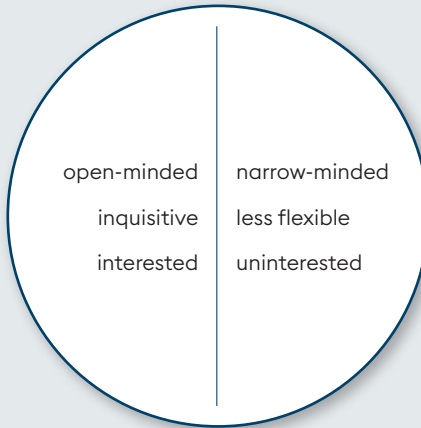
Generally people who exude conscientiousness and agreeableness as well as show empathy and a willingness to cooperate. And those who are quick to trust are more extraverted and less neurotic.

The OCEAN Model

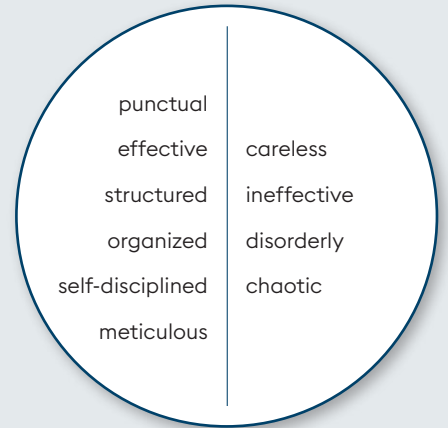
Statistical analysis of human vocabulary has produced five global traits that every human has to some extent. These personality traits encompass the following characteristics – but there are also many others. There are degrees between the two extremes.



Openness to Experience



Conscientiousness



E

Extraversion



A

Agreeableness



N

Neuroticism



Should companies also be agreeable, conscientious, cooperative and empathetic so that their customers will trust them?

Absolutely. For a company, those are precisely the virtues that it must practice and document both outwardly and inwardly if it is to be perceived as trustworthy – we are dependable and meticulous; we cooperate and listen to our customers; we understand their concerns. You can count on us. A company must put all these characteristics into practice every day and do an effective job of broadcasting them through its online presence, in meetings with customers, in production, and in the finished product.

How exactly does one engender trust among customers?

What is important in my view is openly and honestly pointing out the pros and cons of a product. That doesn't mean going so far as to shine the spotlight on the downsides. Instead, customers should feel that you are dealing with them with the best of intentions and not trying to pull the wool over their eyes. Empathy is also an issue. As a customer, I want to feel like I'm being taken seriously; like a company cares about me and values me. That makes it essential for businesses to cultivate existing relationships with customers rather than merely trying to gain new ones. Promotional campaigns in particular often make me wonder why some companies offer them only to new customers and not to their existing client base.

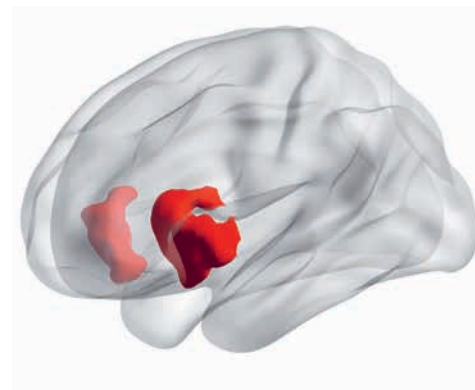
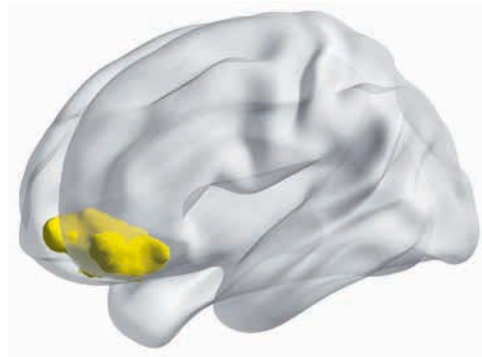
How rapidly can a company lose trust?

Trust takes a long time to build up but can be shattered in an instant. Companies that conduct themselves reliably and with a long-term approach are more successful over time. A company such as Facebook, which gives the outward impression of not being very trustworthy on account of the ongoing data scandal, can afford to do so only because it has something of a monopoly. Individual consumers need to decide for themselves on the point at which the Rubicon is crossed and the abuse of trust is simply too great to bear. Naturally, that applies not only to interactions with organizations but also to personal relationships.

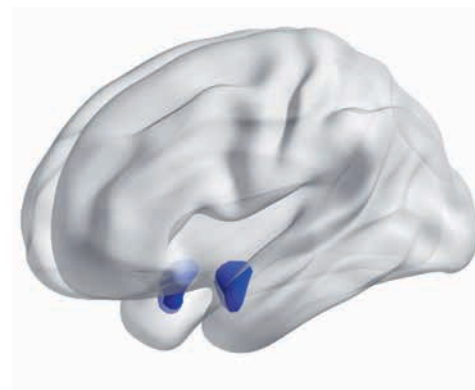
We are living in an age in which a great many things are changing at an astonishing rate. In the business world, change represents an almost everyday occurrence. How do you motivate employees to get involved with new things and live with uncertainty? Does trust play a role in that?

One thing is certain: persuading people to change their behavior or their routines is extremely difficult. As a species, we are creatures of habit. We make New Year's resolutions to exercise twice a week from now on, and then nothing happens. Making changes is incredibly hard work. That is something that companies always need to bear in mind in their change processes. Phases of change are also phases of uncertainty,

The structure of the human brain is associated with how easily someone trusts others. A 2015 imaging study by Brian W. Haas et al. showed that the more gray matter in the ventromedial prefrontal cortex – part of the frontal lobe of the cerebral cortex (**yellow**) – the quicker one person is to trust another. The same applies to the frontal part of the insular cortex (**red**), which is also part of the cerebral cortex.



What happens when oxytocin hormone is administered nasally? This question was addressed by a neuroimaging study by Peter Kirsch et al. published in 2005. It found that oxytocin reduces the activity of the amygdala while fear processing (**blue**), one of two areas located deep within the brain. The amygdala plays a role in fear conditioning and analysis of potential dangers. Put simply, the lower the activity, the less fear the person experiences. Administering oxytocin could therefore influence the development of trust.



and the best way to overcome that is through transparency and by patiently explaining things. It is absolutely essential to communicate, involve people, and make them feel that they are being listened to. Employees want to trust that the people at the top mean well and are doing the right thing. Managers need to speak honestly, pitch in themselves and mobilize resources. That is because the principle that people are stronger in groups than they are alone applies in this case as well.

When it comes to innovation and the digital transformation, it seems that speed, creative destruction and abrupt shake-ups are regarded as a magic formula. This is a bad time to build trust, is it not?

Move fast and break things: that is a principle that used to be very trendy, and still is in some quarters. However, some in Silicon Valley, where the phrase originated, and elsewhere have now come to the realization that with some things, you pay much too high a price for it to be worth breaking things without good reason. I'm thinking about such examples as election tampering, fake news and the like on social media platforms, for which our democracy is paying a very high price. Yet in the

struggle to come up with new ideas, it is certainly true that it is necessary to move fast and sometimes make productive mistakes. However, that must not mean leaving everything else by the wayside. Otherwise, the entire company could perish more quickly than people might think. In my opinion, trust is always a precious commodity in society and in human interaction.

Does trust have a social function as well?

Definitely. It is the glue that holds our society together. We are social beings; we want to build bridges between people. These bridges are founded on trust – between partners, between parents and their children, between management and employees, but also, on a much larger scale, between countries or organizations. Trust also has an economic function, as illustrated by the collapse of the Lehman Brothers investment bank. If trust is lost, things become difficult. I know of at least one study that demonstrates that there is a strong correlation between growth in per capita income and trust. In other words, the economy works better when there is trust.



Christian Montag views the results of genotyping on samples. The researchers want to find out which gene expressions a person has at a specific locus; that is, at a particular position in the genome.

An Expert in Personality

Christian Montag is a professor of molecular psychology at Ulm University and a visiting professor at the University of Electronic Science and Technology (UESTC) in Chengdu, China. He studies the biological foundations of human personality, their genetic causes, and how they influence our individuality in combination with environmental factors. However, he is not merely a psychologist, but also a neuroeconomist. His research in this field encompasses areas including the biological foundations of trust and our financial decision-making.

Röchling Group

The Röchling Group has been shaping industry. Worldwide. For nearly 200 years. Röchling transforms the lives of people every day with its customized plastics: they reduce the weight of cars, make medication packaging more secure and improve industrial applications. The company's workforce of around 11,500 people is located in the places where its customers are – in 90 locations in 25 countries. The Group's three divisions generated total sales of 2,352 million euros in 2019.

2019 **212**

2018 **214**

2017 **228**

2016 **212**

2015 **209**

EBITDA in million euros

2019 **2,352**

2018 **2,140**

2017 **1,841**

2016 **1,657**

2015 **1,555**

Sales in million euros

2019 **11,474**

2018 **10,929**

2017 **9,733**

2016 **8,800**

2015 **8,400**

Employees as of 31 December

2019 **38.7**

2018 **38.5**

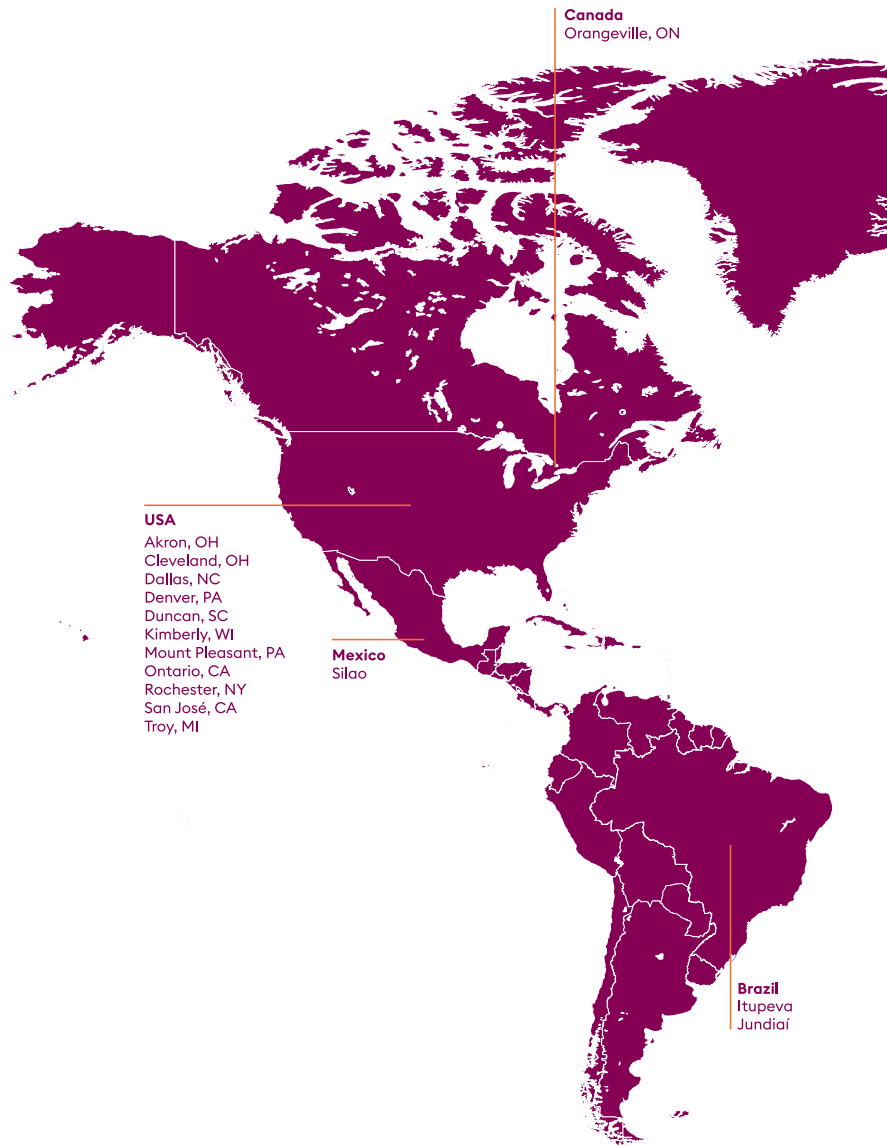
2017 **42.2**

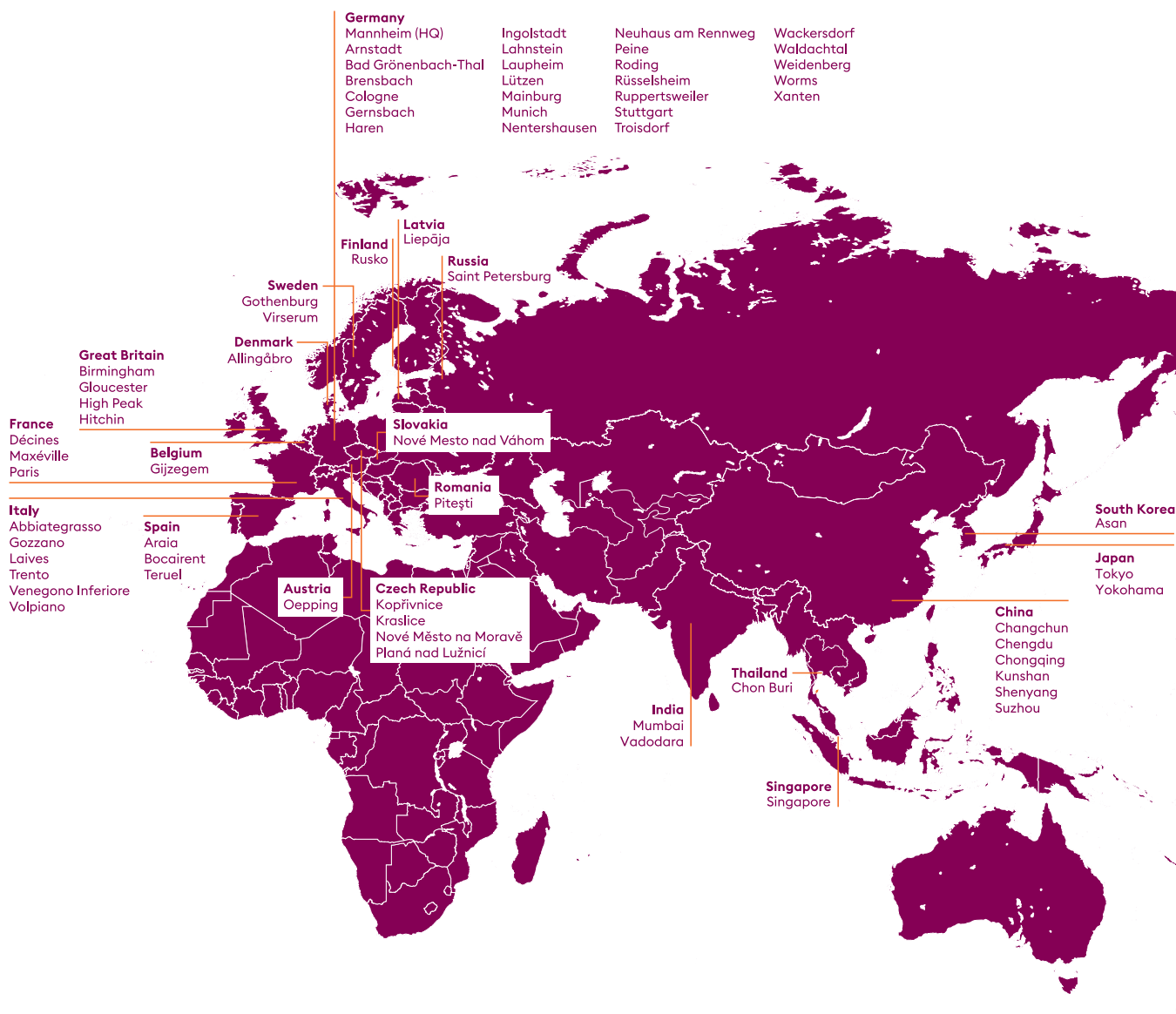
2016 **44.0**

2015 **42.0**

Shareholders' equity in percent

A global presence: 90 locations in 25 countries







Bio Products in Focus



Three divisions, three experts in bioplastics and sustainability (from left to right): Dr. Axel Höfter (Röchling Industrial), Sebastian Koller (Röchling Medical) and Mirco Brusco (Röchling Automotive).

Two things are true – firstly, you would not have cars or cellphones, televisions or shampoo bottles, without plastic. Secondly, plastic pollutes our oceans, rivers, lakes, and soil. Disposable products that are not disposed of correctly and enter the environment represent a particular source of pollution. The dilemma is plain to see, and a huge collaborative effort is needed to find feasible solutions quickly. As a processor of plastics for technical applications, but first and foremost as a company that is fully aware of its social and ecological responsibility, the Röchling Group sees it as its duty to help develop these solutions. These are set to form part of a comprehensive sustainability strategy.

One thing is certain: the more plastic that is released into the environment, the greater the damage will be to people, animals, and plants. Even though this concerns packaging waste primarily, we must also cast a critical eye on technical plastics like those processed by Röchling. On the one hand, they make an important contribution to environmental protection and the conservation of resources thanks to their low weight, long service life, and numerous recycling possibilities. However, there is still room for improvement on the long journey between the production of a plastic product and the day it goes out of service.

The Röchling Group hopes to help future generations secure a world worth living in. Among other things, the focus will be on the use of bioplastics. Experts anticipate that these plastics will be able to contribute to resource efficiency and a bio-based circular economy in certain sectors. Recycling also plays an important role. Where do the Röchling Group's three divisions stand in regard to this? What specific challenges are they faced with, and what do their customers expect? An overview.



Industrial Division

What is the current situation?

The Industrial division works with Lignostone®, a plastic based on renewable raw materials that was developed over 100 years ago. Lignostone® consists of beechwood veneers that are press-molded with synthetic resin to create sheets and rings. The rotary-cut veneers used for Lignostone® are produced exclusively from trees sourced from certified sustainable forestry. It is mainly used in the construction of transformers and cryogenic insulation. Aside from this material, Röchling has also turned its attention to biocomponents and is now able to offer a range of other materials containing a large proportion of bio-based ingredients where required. These include polyethylene (PE) and polyamide (PA) that can be reinforced with sunflower meal or hemp fibers without impairing the recyclability of the product. Röchling Industrial is in close contact with international raw material manufacturers specializing in bio-based materials.

What do customers expect from Röchling?

“Our customers have trust in our capacity for innovation and know that we are constantly striving to come up with new developments. At the same time, they expect our materials to be absolutely efficient and safe when used,” says Dr. Axel Höfter, General Manager Research & Development at Röchling Industrial Haren, Germany. For plastics used in the Industrial division, one thing applies above all else: they must be durable, so their properties must not change throughout their service life – when used in transformers as well as when used in wind turbines, storage tanks or floodgates. “Our focus is on non-biodegradable plastics,” explains Höfter. However, these can definitely be bio-based. “This is something our customers are keen to see – provided that technical requirements are met and they are cost-effective,” states Höfter.

What are the main challenges of the future?

“It’s not just bio-based and biodegradable plastics that are sustainable,” explains General Manager Research & Development Höfter, referring to the possibilities offered by production. According to Höfter, production offers an important parameter for creating greater sustainability and a smaller CO₂ footprint – the keywords here are lower energy consumption and less waste. In addition to expanding its development of biopolymers that offer the same functionality as conventional plastics, Röchling Industrial has been establishing recirculation systems for quite some time now. Here, plastic that is inevitably accumulated in various production processes is reused even more consistently (post-industrial recycling). Höfter also believes that the company needs to consider the recyclability of products as early on as the design process.

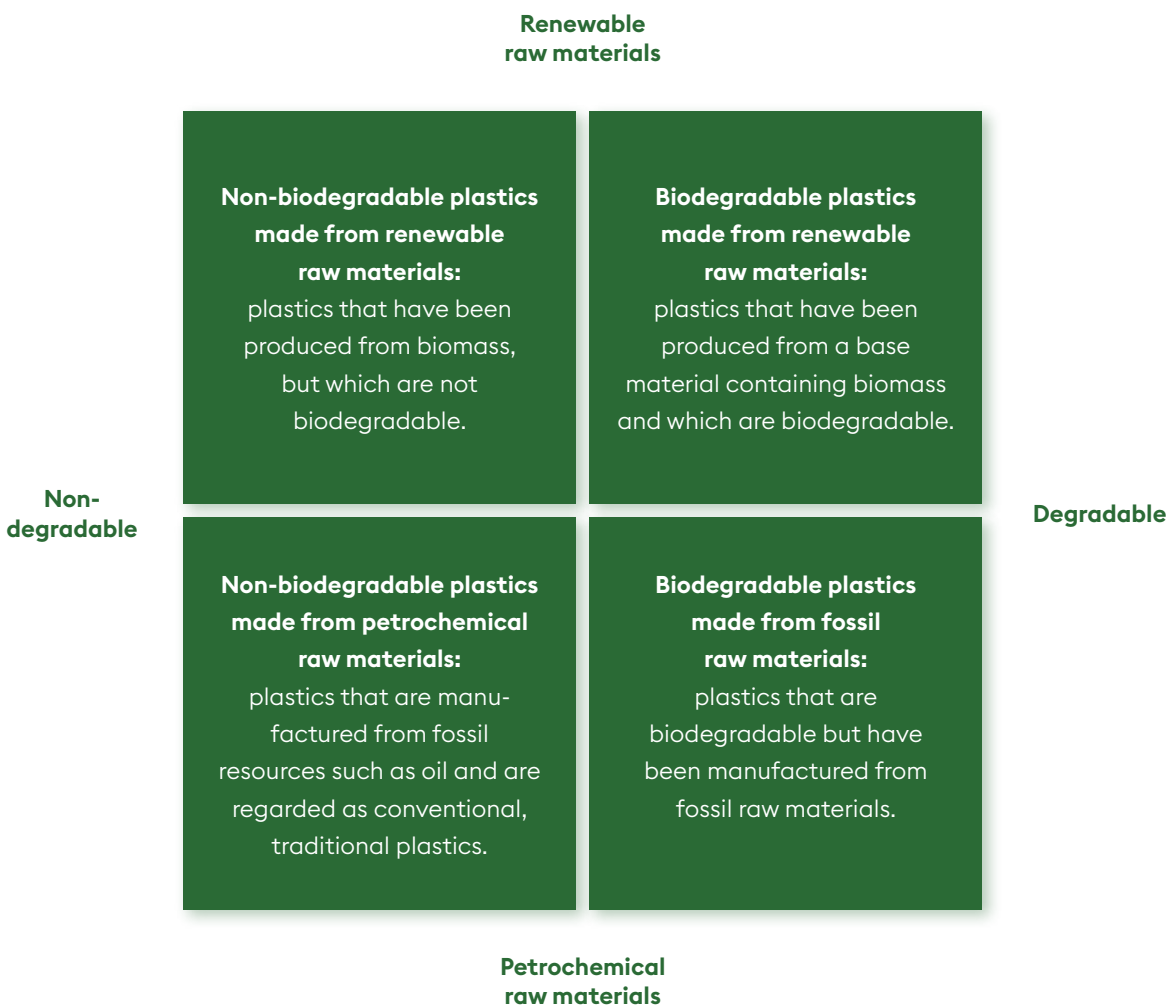


Bioplastics – What Are They?

Bioplastics can mean two things. It can either refer to **bio-based plastics** – in other words, plastics that are based entirely or in part on renewable raw materials, such as corn, potatoes, or sugar beet. For example, sugar beet is processed to produce ethylene, which can then be used to manufacture polyethylene (PE). Starch – obtained from corn or potatoes – can be processed to produce lactic acid and then polylactide (PLA). In many cases, bio-based or partially bio-based plastics have the same properties as their conventional counterparts produced from fossil raw materials such as oil.

Secondly, bioplastics can also refer to plastics that are **biodegradable**. This describes a biochemical process where microorganisms present in the environment convert the material into natural substances such as water, carbon dioxide, and compost. No artificial additives are required. Contrary to what you might expect, nowhere near all bio-based plastics are biodegradable. On the other hand, many plastics manufactured from non-renewable fossil raw materials such as oil are biodegradable. Biodegradation therefore does not depend on the base resource, but on the chemical structure.

One Family, Four Groups





Sustainability – More Than Just Bioplastics

The sustainability strategy of a plastics processing company involves more than just the use of bioplastics. As a processor of plastics for technical applications, the Röchling Group intends to reduce its ecological footprint on an efficient and sustainable basis – for example, by conserving natural resources in production processes. This is why the company analyzes its material and energy flows and develops measures to curb energy consumption, emissions, waste materials, and waste water. Unavoidable plastic waste that is generated during production can be collected by type and reused. Many of the Röchling Group's locations are certified to internationally recognized ISO 50001 "Energy Management System" and ISO 14001 "Environmental Management System".



Automotive Division

What is the current situation?

For more than ten years, Röchling Automotive has been focusing on optimizing the bio-based plastic polylactide (PLA). “We firmly believe that demand for biopolymers will rise sharply in the automotive industry. We are prepared for this, since we have developed a high-performance bio-based plastic on the basis of PLA, which is itself suitable for use in sophisticated automotive applications,” explains Mirco Brusco, Vice President Research & Development at Röchling Automotive. He is clear on one thing: the Röchling Group will only live up to its aspiration to be a global plastics pioneer once it has developed high-performance biopolymers. “We’re leading the way – we’re not going to wait until legal regulations require us and our customers to use biopolymers,” says Brusco. He explains that although there are no biopolymer series applications at Röchling Automotive yet, materials and samples developed on the basis of PLA have already achieved very good results in validation procedures. “These materials can also be processed without any complications and no changes are required in our manufacturing processes,” says Brusco.

What do customers expect from Röchling?

Röchling Automotive regards sustainability as one of the main issues for the automotive industry, both now and in the future. Brusco explains that it may be possible to reduce the CO₂ footprint of vehicle production through the use of bio-based plastics – a key plus point in terms of brand image. Safety and ensuring product quality are still key priorities for Röchling Automotive customers – above all else, materials used in vehicles must be able to withstand high temperatures and pressure and be chemically resistant. “Our customers have always had confidence that our plastics can do all of this. We are also turning our attention to sustainable plastics, and our customers expect these to meet the same requirements as conventional materials. There can be no compromises when it comes to safety,” states Brusco. He explains that developing these materials is no problem nowadays in terms of technical requirements. Röchling Automotive is concentrating on polymers that are bio-based but non-biodegradable. “We already have certifications from recognized independent authorities. These prove that our biopolymers are manufactured from renewable raw materials and therefore promote sustainability.”

What are the main challenges of the future?

According to Brusco, automotive manufacturers and their suppliers are faced with the challenge of helping to define what “green” means exactly and what it does not mean. An electric car emits no pollutants and so it is “green” in this respect. However, if you want to determine a vehicle’s full environmental impact, you need to look at its entire life cycle, including how it was produced. “If we use natural resources to manufacture our plastics and products, this will improve a car’s life cycle assessment further,” says Brusco. He explains that the higher cost of bioplastics is still making it difficult to market them more widely, but the fact that a vehicle’s life cycle assessment is becoming an increasingly important factor is making people more willing to accept these prices. Furthermore, it is only a matter of time before the increased distribution of biopolymers leads to competitive prices too. “What’s more, oil is used to manufacture conventional plastics, but this is a finite raw material and it will continue to get more expensive over time,” says Brusco. For Röchling Automotive’s Vice President Research & Development, the use of bioplastics goes hand in hand with the use of recycled plastics: “In the Automotive division, it won’t be a case of 100 percent bio-based materials or 100 percent recycled materials – it will be a combination of the two.”



Cross-divisional communication (from left to right): Dr. Axel Höfter, Mirco Brusco, and Sebastian Koller discuss concrete opportunities to work together in the field of bioplastics.



Circular Economy – What Is It Exactly?

The traditional linear economic model – the so-called “throw-away economy” – relies on large volumes of cheap, easily accessible materials and energy. A large proportion of the raw materials used are landfilled or incinerated at the end of a product’s useful life. Only a small amount is sent for reprocessing. The best example of this is plastic products and packaging. They are light, practical, inexpensive, and flexible, so it is no wonder they have conquered the world to such a large extent in recent decades.

In a traditional economic model, natural resources are often treated as infinite. This is not sustainable, as demonstrated by climate change, environmental pollution, and water shortages. This is where a circular economy comes in, which many regard as the economic model of the future. It is based on the concept of sharing, leasing, reusing, repairing, reconditioning, and finally recycling, existing materials and products for as long as possible. The ultimate objective is a closed-loop material cycle, where products and materials are regarded as recyclables rather than waste at the end of their use phase. In a closed-loop system like this, plastic parts are not even used in the first place if they are not really needed. Essential parts are designed so that they can be kept in the cycle by reusing, recycling or composting them.



Plastic Recycling – How Does It Work?

Plastic recycling is a system where used plastics undergo mechanically processing by being crushed, cleaned and separated by type, and then turned into new products – either for their original purpose or a different purpose. According to a study carried out by a research group from the University of California in 2017, nine percent of plastics produced worldwide to date have been **mechanically recycled** in this way. The mechanical recycling rate in Germany currently stands at 36 percent. The European Union's objective is a mechanical recycling rate for plastic waste of 55 percent by 2030. It can only achieve this aim if the quality of waste collection and processing is improved. Used plastic parts need to be clean when collected and easy to break down into groups according to type. However, this also means we need to change our way of thinking in terms of product design in order to make these products more recyclable further down the line, so that they can go back into the materials cycle.

In addition to the mechanical recycling of plastic waste, **feedstock recycling** is also an option, although this is rarely used. This involves breaking down the polymer chains in the plastic, producing monomers, oils and gases which can then be turned into new plastics. This procedure is also suitable for mixed and contaminated materials.

The fact of the matter is that the majority of plastic waste produced at present still ends up on the waste heap and is used to **generate energy**. But this is not recycling, strictly speaking. The waste is incinerated, producing heat which is used to supply energy. This means that a used plastic detergent bottle is turned into electricity – but it is not converted into a plastic that could be used to manufacture a wind turbine, for example.



Medical Division

What is the current situation?

Disposable products, surgical instruments and implants – growing volumes of high-performance plastics are being used in medicine and medical technology, primarily as a replacement for glass and metal. The plastics used have important constant properties: they are biocompatible – for example, they are non-carcinogenic, non-cytotoxic, non-hemolytic and non-allergenic. They are chemically and physically resistant, even when a medical product has a long life cycle and is exposed to extreme short-term loads, such as during the sterilization process. According to regulations, biodegradable medical products must not, cannot and should not fulfill this resistance requirement. “Certain drug delivery systems or suture materials are not intended to be resistant. They break down according to a precisely defined pattern. This also applies to some implants which decompose naturally and release the necessary active agents,” explains Sebastian Koller, Head of Innovation & Development at Röchling Medical Waldachtal, Germany. However, the plastic used in implants that remain in the body must not be biodegradable, of course, which is why the use of bioplastics in the medical technology industry is subject to certain framework conditions. Röchling Medical has been developing high-performance bioplastics for over five years. “These certified bioplastics would be an important step for us, allowing us to offer our customers an alternative to our conventional plastics,” explains Koller.

What do customers expect from Röchling?

There is growing demand among Medical division customers for plastics of biological origin with a sustainable ecological footprint. “Our customers trust Röchling as a strong and reliable partner when it comes to selecting the right material and right combination of materials, because every processing method and every medical or pharmaceutical application needs the right type of plastic,” states Koller. In future, Röchling Medical will invest more heavily in sustainability and work with partners to promote innovations in this area. While product recyclates can be used in other industries in addition to bioplastics, these recycled materials cannot be used in the medical sector: “Plastic cleanliness is one of the most important criteria. We operate in a highly sensitive market where evidence must be provided at all times that any risk of contamination with germs or substances that pose a health risk has been eliminated,” explains Koller.

What are the main challenges of the future?

In addition to the conventional medical grade plastic types used up to now, Röchling Medical must also provide a “green” type of plastic of biological origin. In the early stages, this could involve materials made of a combination of conventional plastics and bioplastics. “We are working on customized, pioneering solutions in order to meet current challenges, such as those faced in the area of medical care,” says Koller. If pharmaceutical packaging – such as that used for drugs – has to be disposed of at the end of its useful life, the most sustainable option would be if this packaging was made of biodegradable plastics that could then be composted. “However, we would then need to ensure that contaminated packaging was fed into a separate cycle for special biowaste. This will require innovative solutions from the recycling industry,” explains Koller. However, manufacturers such as Röchling Medical could design medical products so that they allow for better separation, therefore making them more recyclable. Parts that are contaminated would continue to be disposed of as normal, while uncontaminated instrument parts or packaging could be fed into the bio-cycle. “We want to use our many years of plastics expertise to help make medical technology products made from bioplastics a sustainable alternative to conventional plastic types,” states Koller. In future, we will therefore forge more alliances with partners and work with them to promote the compounding of medical grade plastic types of biological or sustainable origin.

2

million metric tons of plastics were produced in 1950 – rising to

360

million metric tons by 2016

Source: Roland Geyer et al., Production, use and fate of all plastics ever made, University of California 2017

250 million metric tons of plastics were used worldwide in 2018

77 million metric tons of plastics entered the environment:

173 million metric tons of plastics were collected:

63

million metric tons disposed of incorrectly, e.g. on unauthorized landfill sites

50

million metric tons recycled

14

million metric tons carelessly discarded

51

million metric tons used to generate energy

72

million metric tons disposed of correctly on landfill sites



Source: Conversio Market & Strategy GmbH

Industrial

The Industrial division is the expert for optimal materials for every use. Röchling develops and supplies individual products made of plastic for all industrial areas. This is why the company has the broadest product range of thermoplastics and composite materials. Röchling supplies its customers with semi-finished products or machined components.

847

million euros in sales

42

locations

3,959

employees



Giants of the Sea



Assembly works on the quay wall: Liebherr, based at Rostock port in Germany with direct connections to the Baltic Sea, produces maritime cranes for the international market.

When wind turbines weighing more than 1,000 metric tons need to be erected at sea or disused offshore oil and gas drilling platforms are to be dismantled, the situation calls for XXL-size cranes – and they are becoming ever taller, stronger, and tougher. For decades now, Röchling Industrial Xanten has been supplying Liebherr, one of its customers and a manufacturer of these steel giants, with essential heavy-duty plastic components that can withstand the harsh conditions out at sea and yet are impressively lightweight at the same time.

In recent years, renewable energies have become increasingly important in electricity, heating, and transport. Continuing expansion in renewable energies requires systems to match, and offshore wind power provides one example. These turbines are getting bigger all the time, and anyone involved in their construction and in supplying important equipment for setting up the systems needs to adapt accordingly –

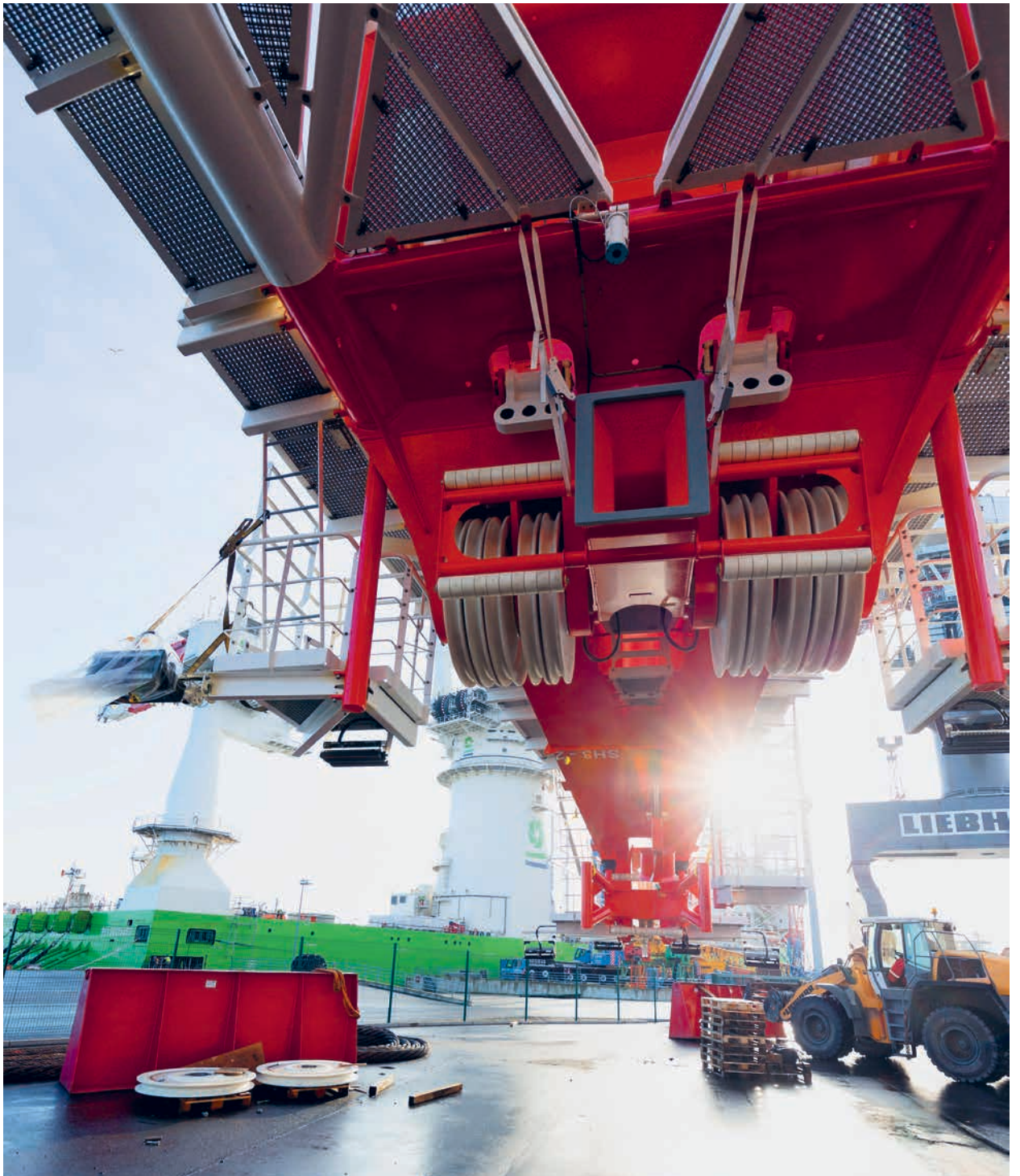
and that includes crane manufacturers. At the same time, the shift toward renewable energies is a driving force behind more and more disused offshore oil and gas drilling platforms being dismantled. The objective is to remove the largest possible sections at once so as to cut down on the number of trips required back and forth to each site and to make the dismantling work at sea as low-risk as possible. This is where heavy-duty

Liebherr in Rostock

Liebherr's Rostock site in Germany is the group's maritime hub. Liebherr-MCCtec Rostock GmbH is responsible for all mobile harbor crane, ship crane, and offshore crane products. The company has additional maritime plants in Killarney, Ireland, for building rail-mounted cranes, and in Sunderland, UK, for manufacturing reach stackers for rapid transshipment of containers and goods.

The facility in Rostock is ideally suited to producing maritime cranes for various sizes and applications. Direct access to the Baltic Sea is a crucial part of logistics for the global sale of these cranes, which can be shipped either in parts or fully assembled. "That's good for our customers, because the product can be ready to use right away if required," says Poll. The team in Rostock can take care of every stage of the process, from development and steelwork to assembly and installation, as well as loading and inspection. Liebherr-MCCtec Rostock supplies leading shipping companies and shipyards as well as owners and operators of ships and jack-ups in the heavy lift sector worldwide.

State-of-the-art equipment is used to assemble cranes such as the HLC 295000 on the special-purpose ships that moor up at the Liebherr-MCCtec quay wall in Rostock. The TCC (Travelling Cargo Crane) 78000, which entered operation in summer 2019, is one such example. With a maximum lifting capacity of 1,600 metric tons and a maximum lifting height of 158 meters, the TCC 78000 is perfect for this challenging undertaking. The rail-mounted slewing jib crane is equipped with a double trolley (two rails per side) and a track gauge of 30 meters.



The boom for the new Heavy Lift Crane HLC 295000: the more weight that can be saved here, the higher load capacities it can achieve. Sheaves made of plastic are the method of choice.

cranes come in. “Our new Heavy Lift Crane 295000 can do all of this safely in extremely tough conditions and with loads weighing up to 5,000 metric tons,” says Daniel Poll, Sales Director for Ship and Offshore Cranes at Liebherr-MCCtec in the German city of Rostock.

Extreme Conditions

The extreme conditions out at sea, including storms, high waves, terrible weather, and the distance to the shore, mean that technology and material are needed in previously unheard-of ways. Erecting a wind turbine involves numerous components being pre-installed before the system has left port. These elements are then conveyed on specialized transporter and installation vessels or lifting platforms to the construction site. Each of these vessels also carries a heavy-duty

offshore crane that can be operated reliably even in the most adverse environments, such as rough seas or high winds. Given the intense nature of these conditions at sea, the crane developers work with operators and in line with the applicable standards of the relevant cranes to ensure safety at all times while the wind turbines are being erected.

Anchoring wind turbines to the seabed is one of the biggest challenges in the installation process. Massive foundation structures first need to be lowered onto the seabed and then anchored into place using different methods. Lifting these foundations and various turbine components calls for cranes with high load capacities. They also need to be capable of lifting the topsides – the parts of wind turbines that sit above the waterline – to heights of up to 175 meters.

Röchling Industrial Xanten

Röchling Industrial Xanten, Germany, is the center of excellence for custom casting within Röchling’s Industrial division. The plastics processing company was established in 1924 and was the first in Europe to produce non-metallic slide bearings for rolling mills. Today, it specializes in the manufacture of large-volume and heavy-duty cast polyamide parts. In addition to heavy-duty sheaves for cranes, its products include support plates, guide rollers, wear plates, gear wheels, elevator pulleys, and sprockets. The company supplies customers in fields including crane and lifting equipment, elevators and escalators, drive system and conveyor technology, the steel and rolling mill industry, the beverage and packaging industries, the food and paper industries, warehouse and logistic technology, and wastewater technology.



Jaww Meijer, Sales Manager at Röchling Industrial Xanten, inspects a sheave in production at the Xanten plant in Germany. It has been produced from an extremely high-quality cast polyamide.

Portfolio Expansion

“We build our cranes to be capable of lasting 20 to 25 years working reliably in extremely tough conditions, depending on what our customers require. No matter the application, one of our cranes is always the most important piece of equipment on an installation vessel of any kind,” explains Poll. Liebherr is intending to expand its range of heavy-duty cranes for the offshore sector systematically in the coming years. “The future is very promising in this sector,” says Poll. “We are anticipating growth in both alternative energies and dismantling offshore facilities.” The company’s products and services consistently have to deliver what the Liebherr name promises: high quality, state-of-the-art processes, and exceptional supplier performance.

The company expects no less of its suppliers. “For us, that means flexibility and keeping the customer’s needs in mind at all times,” says Peter Landwehr, Head of Purchasing at Liebherr-MCCtec in Rostock – which gives Jawk Meijer, Global Sales Director at Röchling Industrial Xanten, the perfect opportunity to add, “We make it our mission to be the best and most flexible partner to our customers. Focusing on customer requirements and striving for continuous improvement are among our top priorities.” Röchling Industrial Xanten has been making cast products for cranes and lifting equipment for more than 40 years, and Liebherr is one of its longest standing customers for these products.

The particularly high quality of Röchling’s cast polyamide products is illustrated by their outstanding heavy-duty capabilities,

The Ship

The Orion is a special-purpose vessel operated by DEME, a dredging and offshore and marine engineering group. The company, based in the Belgian city of Antwerp, uses the Orion to build the latest generation of multi-megawatt offshore wind turbines and to dismantle disused oil and gas drilling platforms at sea.

Building of the ship began in April 2018. The vessel is 216 meters long and has a dual-fuel engine designed to run on both mineral oil and natural gas. According to the company, the ship’s total installed capacity is 44,180 kW. The Orion has a helicopter deck and can accommodate a crew of 131, with the potential to expand this to 239. The Orion docked at the Liebherr plant in Rostock in late November 2019 and was fitted with the heavy-duty crane there.

above-average abrasion resistance, excellent long-term resistance to corrosion and wear and tear, UV resistance and minimal need for maintenance. Plastic is also a lighter burden to handle than steel – quite literally. Its much lower weight plays an important role in crane design, because the more weight can be saved in the boom of a crane, the higher the load capacities it can achieve. “We at Liebherr do not simply buy in Röchling products. They are much more than that; they are a true asset in our product development,” says Landwehr.

Meijer considers the successful history of plastic, recalling that the trend for gradually replacing various costly and heavy metal components with plastic in the production of cranes began in the mid-1970s. Today, high-quality technical plastics are used even

in heavy-duty applications. “Any time there are two metals moving together and coming into contact, it makes sense to make one of those parts out of plastic,” explains Meijer, who is originally from the Netherlands. Both parts will then have longer service lives and will require less maintenance. One of Röchling Industrial Xanten’s challenges is to find the perfect pairings with exactly the right plastics, according to Meijer, who trained as a metallurgical engineer but has been working in the plastics industry for many years now.

72 Sheaves for the Boom

Röchling Industrial Xanten’s latest project assignment from Liebherr-MCCtec involves the construction of the HLC 295000 offshore crane (see page 54). This is the largest crane that Liebherr has ever developed to date.



The biggest crane that Liebherr has built to date: the HLC 295000 on the Orion special-purpose vessel. The crane can lift up to 5,000 metric tons with an outreach of 35 meters.

The experts in Xanten made 72 sheaves for it. The crane's 72-millimeter steel wire ropes run over these sheaves. Each of the sheaves has to withstand a rope line pull of up to 150 metric tons – the weight of around 130 small cars. From one-off parts to medium-volume series production, Röchling Industrial Xanten casts sheaves tailor-made for specific customers and uses CNC lathes and millers to machine them. “We don't make one-size-fits-all products,” explains Meijer. Absolute precision is essential in production, as is excellent quality for the precursor materials and semi-finished products that are used to make the sheaves.

Various materials from the LAMIGAMID® family are used for production. They offer the necessary load-bearing capacity, dimensional stability and abrasion resistance. Eighty percent of Röchling Industrial Xanten's products are made from polyamide (PA) 6C, including the sheaves for the HLC 295000. Caprolactam, a precursor material, is delivered as a liquid and temporarily stored in two large tanks. From there, it is taken to a casting machine, where application-specific materials are added to the mixture. It is pumped into the molds via closed looped pipelines. The design of the mold, the components of the mixture and temperature control are important parameters in ensuring that the monomers can be

The Crane

At 90 meters tall, the HLC (Heavy Lift Crane) 295000 is the biggest heavy-duty crane that Liebherr-MCCtec Rostock has ever developed and built. Thousands of tons of steel have been molded, welded and assembled. The boom – probably the most distinctive part of a crane – alone is 149 meters long including fly jibs, which means that it would cover the length of an average soccer field and still keep on going for almost another 50 meters.

At an outreach of 35 meters, the crane can bear a load of 5,000 metric tons in some circumstances – the equivalent of nine fully laden A380 aircraft. The longer the outreach, the lower the load-bearing capacity. However, even at an outreach of 50 meters, the crane is still capable of handling loads weighing as much as 3,000 metric tons. The maximum lifting height of the HLC 295000 can reach more than 150 meters, depending on its installation height on board the ship. Despite that, this colossus is relatively compact, because it is installed on a pedestal that measures only around 17 meters in diameter. That means that the crane does not take up much space on the ship's deck, which gives the operator more room to stow turbine parts for transport and for lifting with the crane.


consistently polymerized in the mold. The sheaves can have a maximum diameter of 3.5 meters, and one mold can accommodate up to 2.5 metric tons of material at once. Landwehr is full of praise for the identical ambitions of the two companies in this respect, saying, “Röchling is a highly capable partner to us, and one that maintains the same standards that Liebherr does for its products and processes: high quality, reliability, and innovation. The company also never ceases to impress us with its technical expertise, which is a crucial element in cooperation between our experts and customers.”

The teams in Xanten get involved right from the brainstorming and planning stages,

working with Liebherr and other customers on developing new and innovative ideas. “We have built up a lot of trust over decades of collaborative development projects. We have also established a mutual understanding of the components involved. That saves a lot of time in terms of communication and makes it easier for us to implement reliable solutions,” adds Landwehr. Both partners are sure that when two companies work so closely together, trust and dependability – along with technical expertise – are the most vital elements of a successful outcome for everyone involved. “They are the cornerstones of our partnership.”



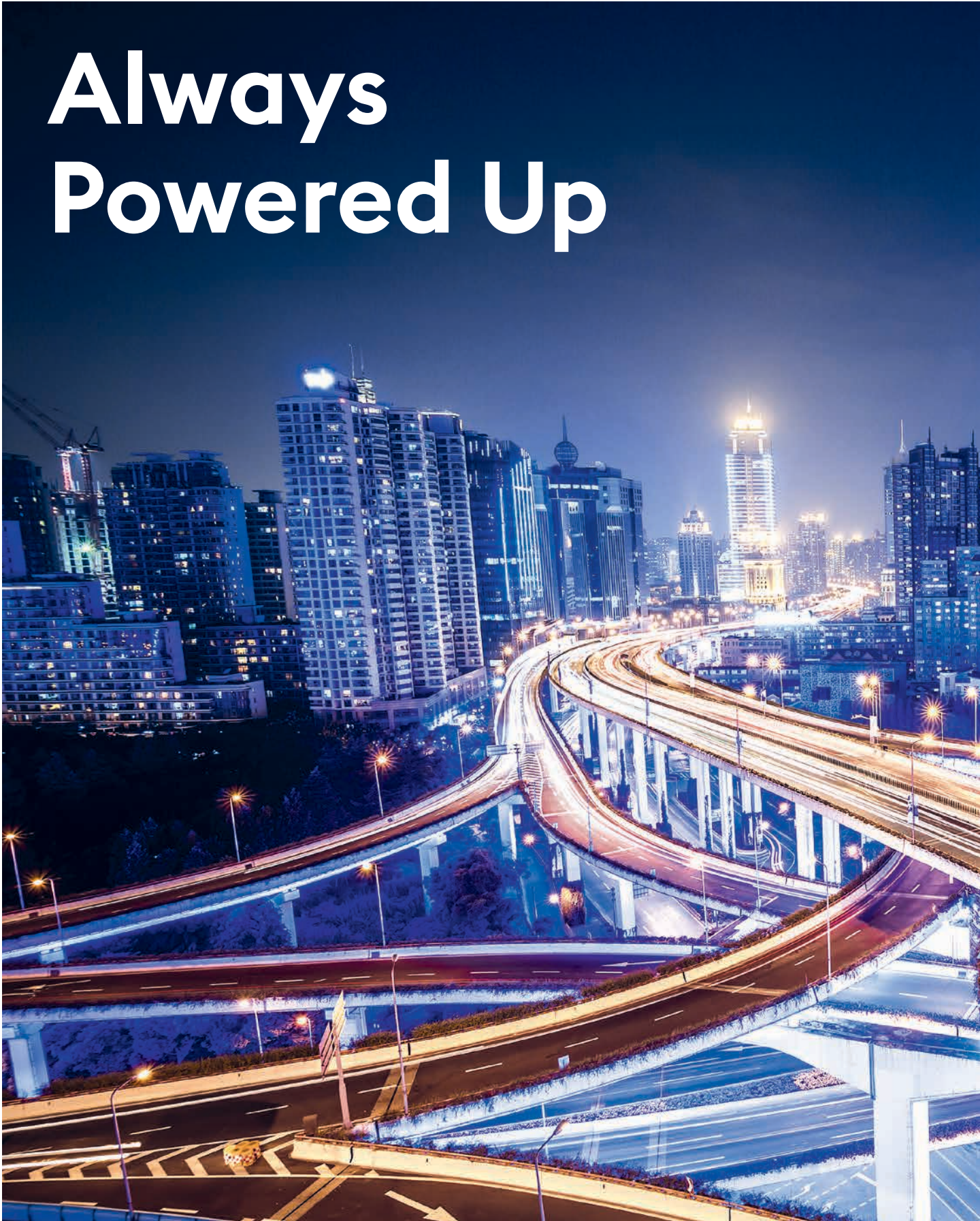
Not half bad: the boom on the HLC 295000 crane is 149 meters long. At the Liebherr site in Rostock, it is constructed directly on the Orion special-purpose vessel.

A close-up photograph of a large industrial crane boom. The boom is constructed from thick, red-painted metal beams that intersect at various points. Several large, white plastic sheaves are mounted on the boom, used for guiding cables. The background shows a large industrial facility with a complex steel structure and overhead lighting. The overall scene is brightly lit, highlighting the textures of the metal and plastic.

The plastic parts in the boom are sourced from Röchling Industrial Xanten. The biggest sheave weighs 558 kilograms, the smallest 12 kilograms. No matter how big or heavy they are, they all feature excellent heavy load properties, above-average abrasion behavior, long-lasting wear and corrosion resistance, UV resistance and minimal maintenance requirements.



Always Powered Up



Cars and subways, trains and airplanes, hospitals and fire departments, telephones and cellphones, Internet and data centers, stock exchanges and banks, supermarkets and private homes – we can all quite easily imagine what would happen if there was a power cut in all of these places for a prolonged period of time. Our modern-day industrialized society is completely dependent on electrical energy – its citizens rely on it, day and night.



A secure energy supply is made up of a number of components. And by the same token, there are lots of factors that can place stress on the overall system and, in the worst case scenario, cause it to collapse – severe fluctuations in output from solar and wind renewable energy sources, technical failure of individual components, or extreme weather events, to name just a few examples.

No Transformers – No Secure Network

Transformers are also required on an unprecedented scale here. They ensure that the electrical energy is transmitted at the right voltage with a minimal amount of losses, and play a vital role in creating a secure and reliable energy supply network. These devices need to be efficient and, above all else, durable and extremely reliable. Because if a transformer breaks down, it is usually not possible to replace it quickly. This is why redundancies are used: if one component breaks down, another one takes its place. Large-scale blackouts will only ensue if this one breaks down too. Power outage times in Europe currently stand at between ten and 250 minutes per customer per year, and around 14 minutes in Germany. Power grids are being pushed to their limits, especially in so-called “megacities”, i.e. cities with more than ten million

inhabitants. Energy consumption in these cities is huge, which poses an extreme challenge for energy producers, grid operators and energy suppliers. There were 33 megacities worldwide in 2018, and this figure is set to rise to 43 by 2030 according to estimates by the United Nations. By then, just under nine percent of the global population will live in these megacities. Mobility, infrastructure, housing construction, and environmental protection are the most important areas that need to be managed. And all of these are only possible with energy. “It’s the beating heart of these cities,” states Hans-Jürgen Geers, General Manager Technology & Marketing at Röchling Industrial Haren, Germany. The company produces insulation materials for transformer manufacturers.

Extreme Requirements for Insulation Materials

In megacities, but also in other locations, there tends to be very little space available to install a transformer like this, meaning that increasingly compact designs are required. At the same time, the power density of these devices needs to remain constant over decades of operation. “More and more transformers are being designed so that they are reaching the limits of these insulation materials,” explains Professor Eckart Buckow from Osnabrück Uni-

versity of Applied Sciences. Together with his team, Buckow has carried out partial discharge and durability tests on insulation materials in oil-filled transformers.

Close Collaboration with the University

These tests are carried out in the university’s high-voltage laboratory which features excellent technical facilities. Röchling Industrial works in close collaboration with the university. “Although our in-house materials laboratory in Haren has very good material testing facilities, these are far and away surpassed by the equipment on offer at the university,” states Geers. He explains that they are working together to develop new electrical testing methods which can be used to investigate the properties of new insulation materials. As a driver of innovation, Röchling Industrial sees the development of new and existing materials as one of its most important challenges. Its aim is to produce innovative plastics that meet the highest standards and offer improved customer benefit.

Since as early as the 1950s, Röchling Industrial has been producing a range of components for oil-filled high-voltage transformers from the unique insulation material Lignostone®



The electrical energy supply and high-voltage technology laboratory at the Osnabrück University of Applied Sciences in Germany offers outstanding equipment and facilities, where the performance of insulation materials made of plastics is tested on testing stations.

Transformerwood®, such as pressure rings, step blocks and pressure beams. This compressed impregnated wood consists of selected beechwood veneers that are coated with phenolic resin and then compressed and joined together under pressure and heat. Today, Röchling supplies around 90 percent of the world's transformer manufacturers with its insulation components, making

the company a global market leader in this area.

“Copper beech wood provides the best electrical and mechanical strength here,” explains Geers. This is an essential prerequisite when used in oil-filled transformers, as the insulation materials need to have electrical insulation properties and be able to withstand high mechanical loads, since high

overloading is becoming pretty much the norm in increasingly complex power grids. The components must also offer good resistance to insulating oils and thermal resistance, but the most important thing is their durability. Insulation materials need to last between 30 and 40 years – at operating temperatures of 90 to 110°C, under high electrical loads and high levels of moisture. Lignostone® Trans-

formerwood® has proven that it is up to the task. Tests were carried out on components that had been installed in a power plant's transformer for more than 30 years, and the results were outstanding. All values for flexural strength, compressive strength, electrical strength and modulus of elasticity were only slightly below average new material values, and exceeded them in some cases. Even after 30 years, the material was still entirely reliable.

Innovative Solutions for Customers

However, Röchling Industrial is not happy just to settle for the status quo. Customers should instead be offered innovative products that open up new opportunities for them to develop even better and more efficient transformers. Lignostone® UHV is one such development featuring outstanding electrical properties. "We have extremely highly trained engineers and staff within our team, some of whom have decades of experience with insulation materials. They are constantly developing innovative solutions, thereby enhancing the benefits offered to our customers," says Geers.

In a brief summary of other customer requirements, he explains that Röchling must provide an excellent level of quality with

absolute reliability, including outstanding service and expert advice. "In a nutshell, this means that our customers want to be able to rely on us 100 percent," states Geers, who also takes this opportunity to mention the company's high level of production expertise. Lignostone® sheets, which can be as much as three by four meters in dimension, are manufactured using hydraulic 17,000 metric ton presses. These ensure extremely narrow tolerances – the sheet is the same thickness around the edges as it is in the middle.

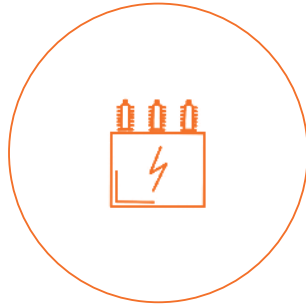
Small Material Defect, Major Damage

Insulation materials must be extensively tested before being used in transformers, because even a small material defect can destroy a transformer worth several million euros and cause power outages leading to a huge amount of damage. It is also important to ensure that there are no air pockets in the material because these can lead to so-called partial discharges which will then destroy the material. "Copper beech wood is an ideal material here. Its open capillaries mean it can be impregnated with oil void of air," explains university professor Buckow. However, there must be no air pockets in the resin adhesive layer either. Röchling Industrial works with very thin

phenolic resin films in order to eliminate these air pockets. According to Buckow, greater attention is also being paid to the environmental compatibility of oil-filled transformers and research is being carried out to find alternative insulating liquids. In principle, for example, synthetic or vegetable oils could be a conceivable option to replace mineral oils – but only with a significantly extended service life.

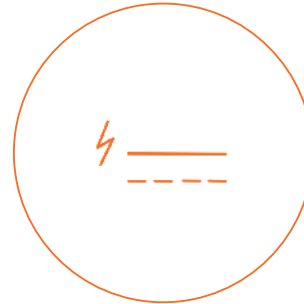
University and Students Benefiting from Cooperation

Buckow rates the university's cooperation with Röchling Industrial very positively: "Our university benefits significantly from its cooperation with renowned manufacturers of transformers and insulation materials." For him personally, this collaborative work provides him with a very good overview of the field and an important insight into the experiences of industrial companies. He explains that this in turn benefits his students in lectures, and for many of them this makes for very interesting bachelor and master's degree thesis topics. "And we mustn't overlook the receipt of third-party funding, of course. After all, this is what makes our state-of-the-art and efficient laboratory equipment possible in the first place."




How a Transformer Works

A transformer usually consists of two or more coils which are wound from insulated copper wire and positioned on a common magnetic core. Electricity flows through the coils. The transformer's job is to convert an alternating voltage input into an alternating voltage output at a certain ratio depending on the number of turns in the coil. Transformers can either increase or decrease the voltage. For example, the voltage from generators in large power stations is only a few dozen kilovolts. In order to transmit the electricity efficiently in high-voltage networks, transformers in the power station must transform the voltage into several 100 kilovolts. By the same token, this high voltage must then be transformed again so that the electricity can be used at a much lower voltage in private homes or industrial facilities, for example.



The Challenge of Direct Current

High-voltage power lines normally transmit alternating current. However, if the energy is generated far away from electricity consumers – for example, in offshore wind farms – direct current transmission is the preferred option because direct current can be transported over extremely large distances with much lower losses compared to alternating current. The main rule of thumb is: the higher the voltage in the direct current network, the lower the level of losses – hence high-voltage direct current transmission. Special transformers that can reliably withstand high loads are required for transport. Trafoboard® HD-PH from Röchling Industrial is an insulation material that is particularly well suited to this task.



University professor Eckart Buckow (left) and Hans-Jürgen Geers from Röchling Industrial have known each other for more than 20 years and both have a common objective: to improve the performance of insulation materials in transformers on an ongoing basis. Thorough testing is being carried out on optimized formulations for the plastic Lignostone® Transformerwood®, which they can be seen holding.



Interesting Employer for Specialist Professionals

General Manager Geers, who has been personally acquainted with the university and Buckow for more than 20 years, also regards the collaboration as a win-win situation: “The univer-

sity can build on its expertise, and we obtain scientifically accurate findings concerning the electrical properties of our materials. We can rely on that with absolute certainty.” Furthermore, this collaboration raises the profile of Röchling Industrial. “We come into

contact with electrical engineering students, whom we then support through their bachelor or master’s theses, for example,” says Geers. Last but not least, this also makes the company an interesting employer for specialist professionals.

Lignostone® – a Sustainable Material

In 1915, engineers Fritz and Hermann Pfelemer successfully converted normal wood into a material with remarkable properties. The patent granted in 1916 – “Process for compressing wood” – formed the starting point for the Röchling Group’s plastic activities. The plastic was given the name Lignostone®, which is made up of the Latin word for wood (lignum) and the English word “stone”. Lignostone® is manufactured from beechwood veneers obtained exclusively from trees sourced from certified sustainable forestry in Europe. Transformers containing insulating components made of Lignostone® can be operated without problems for 30 years, thus conserving valuable resources.

New Materials for Transformer Construction

Röchling Industrial is continuously developing new insulation materials and refining existing materials for transformer construction. This includes Lignostone® UHV, which features significantly improved electrical and mechanical properties, and the Durystone® CR product family which has been produced on the basis of fiber-reinforced plastics and also features outstanding electrical, mechanical, thermal and chemical properties. Röchling Industrial developed Trafoboard® HD-PH for the highest voltage ranges – for example, when transporting direct current over long distances. This is a compressed and laminated press-board bonded with phenolic resin, consisting of homogeneous and highly chemically pure cellulose. These cellulose-based materials are exactly what the high electrical fields in transformers within the very highest output range require.

Hans-Jürgen Geers in one of Röchling Industrial's production halls in Haren, Germany: Röchling experts manufacture products including large, tangentially layered rings from the thinly pared beechwood veneers that are delivered to the plant. Customers use these to produce large one-piece components such as pressure rings, which transfer pressing power to the transformer coil.



Automotive

The Automotive division advances mobility. Röchling's product solutions in the areas of aerodynamics, propulsion and structural light-weight help solve major challenges. In other words, Röchling protects the environment while also improving the driving experience.

1,336

million euros in sales

41

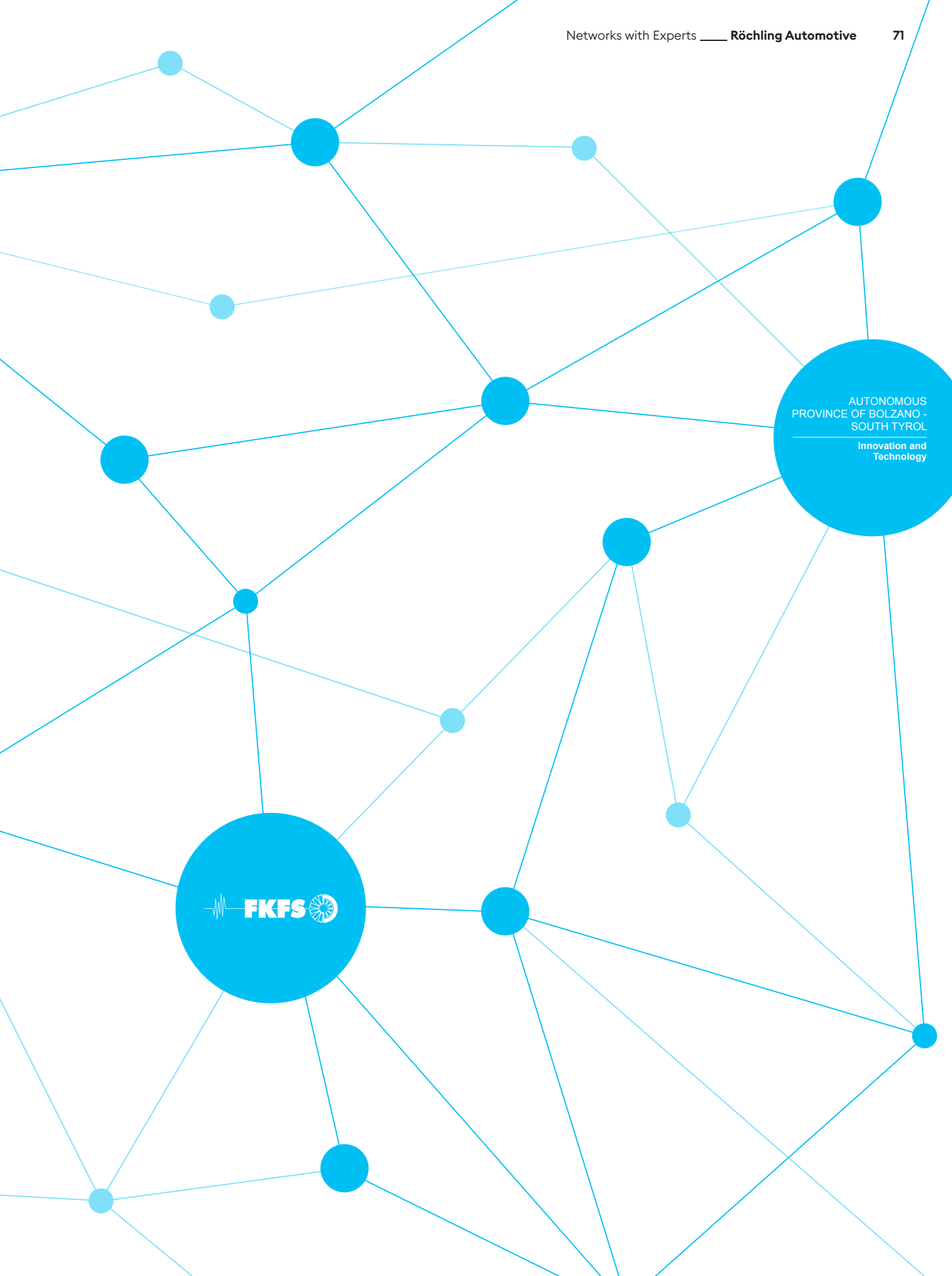
locations

6,267

employees

Don't Go It Alone – Be a Networker

The Röchling Group aspires to be a pioneer and leader in its markets in terms of innovation and quality. The company not only relies on the expertise of its employees in order to achieve this aim, but also works with selected external experts such as universities and research institutes. It establishes partnerships and participates in government subsidy programs. Röchling Automotive is currently involved in a number of such projects. The three following examples show that the company has its finger on the pulse of research and innovation, making it a competent partner to help its customers move towards increasingly low-emission, electric, autonomous and networked vehicles. Safety and trust play an important role here.



Light, Stable, and Safe

**Department of Lightweight Vehicle
Construction at the University of Siegen,
Germany**

The University of Siegen was founded in 1972 as one of five new universities of applied sciences in North Rhine-Westphalia, and was designated the University of Siegen in 2003. 19,000 students were enrolled there in the 2019/2020 winter semester. Development work in the Department of Lightweight Vehicle Construction covers the entire production chain – from material applications and production technologies to design. Its declared aim is to improve lightweight vehicle construction and to open up new, cost-effective and feasible solutions for the industry.



Gefördert durch:



Bundesministerium
für Wirtschaft
und Energie

aufgrund eines Beschlusses
des Deutschen Bundestages



The Department of Lightweight Vehicle Construction at the University of Siegen has a state-of-the-art high speed testing machine. This is used to test the tensile properties of new plastics developed as part of the project at high strain rates. Doctoral student Danshi Li from the University of Siegen and Adrian Baur from Röchling Automotive insert a new material sample in the machine.

Lightweight design is a major theme in the automotive industry and a key technology for the production of low-emission vehicles with optimized efficiency. Röchling Automotive has already developed numerous weight-reducing components and applications in the past. However, the plastic must achieve a sufficient level of strength and rigidity so that these lightweight parts can also be used for structural functions in vehicle bodywork in the future. Röchling Automotive is focusing on tape technology with a view to achieving this goal. Here, the mechanical properties of plastic components are optimized with tapes made of polypropylenes or polyamide and reinforced with glass, carbon or aramid continuous fibers. These tapes can be used precisely in line with the load path, reducing the amount of material usage. This reduces the component weight and lowers costs.

Lightweight construction is also the theme of the “New vehicle and system technologies” funding program launched by the German Federal Ministry for Economic Affairs in 2015. This aims to support research into innovative automated driving solutions. Röchling Automotive, the University of Siegen, the University of Erlangen-Nuremberg, the car manufacturer Opel, the toolmaker Eckerle and FFT, a specialist in intelligent production technology, have come together within this funding program to carry out a research project looking at hybrid lightweight construction. Their aim is to make newly developed plastics just as high-performance as existing metal solutions. This also involves optimizing the potential of lightweight solutions in terms of energy absorption in the event of a crash. The number one rule here is: safety first.



The latest material sample made of longitudinal fiber-reinforced polypropylenes broke during testing. It is exposed to load speeds of up to 20 meters a second during accelerated tensile tests – an extreme amount of stress for the material.

“Universities and research institutes with which we have had trusting working relationships in the past often point us towards interesting funding programs and project tenders. We then check whether it would be worthwhile taking part,” explains Adrian Baur, Materials & Processes Expert at Röchling Automotive and Project Manager. In addition to the funding received, the main benefits for Röchling Automotive include the inspection and testing facilities available at research institutes and the exchange of knowledge with scientific experts. “We are strengthening our network in the institute and research landscape,” says Baur. Each consortium member can also obtain access to the findings of all partners free of charge. Röchling Automotive also values the close contact with automotive manufacturers. “We obtain an in-depth insight into the problems faced by our customers,” explains Baur.

All partners come together for a meeting twice a year, and a number of bilateral meetings are also held. While Röchling

Automotive has in-depth knowledge of manufacturing processes and many years’ experience with multi-materials, the University of Siegen, for example, has design expertise and state-of-the-art test facilities.

“Röchling Automotive plays a very active role in the project and provides our Department of Lightweight Vehicle Construction with extensive plastics expertise,” states doctoral student Danshi Li. “The company has a huge amount of practical experience in production and they help us to use Röchling materials to translate our lightweight construction concepts into a real-life component,” explains Li. Scientists in the department focus on developing methods which can be used to implement efficient lightweight construction concepts in vehicle bodywork and chassis.

“We really appreciate publicly-funded consortium projects like this and the chance to work with industrial companies, as this gives us direct contact with practitioners and allows us to develop interesting doctoral research topics,” says doctoral student Daniel Heidrich. He explains that it is also very useful to see whether the ideas developed can be turned into real-life parts that can be manufactured. This practical relevance is also a key criterion for Röchling Automotive. “Above all else, the project would be a success for us if we ended up developing a complete technology that would allow for the manufacture of highly innovative structural products in series production,” explains Baur. The project was launched in March 2019 and will run until the start of 2022.



How long does a material last before it breaks? The answer to this question is key when it comes to the safety and reliability of vehicles. One of the challenges of the project consists of developing a lightweight yet strong material. Project team members (from left to right) Adrian Baur, Danshi Li and Marta Wladykowska, who is writing her master's thesis at Röchling Automotive, and doctoral student, Daniel Heidrich, examine the sample.

Collaboration in the Wind Tunnel

Research Institute of Automotive Engineering and Vehicle Engines Stuttgart, Germany

The Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) was founded in 1930 as an independent research institute and is an engineering service provider and partner of the international automotive and supplier industry. Around 180 employees conduct research and development projects in the fields of drives, vehicles, vehicle mechatronics, and electric mobility and develop in-house measurement, testing and simulation methods. FKFS is an independent civil law foundation and works closely with the Institute for Vehicle Technology Stuttgart (IFS) at the University of Stuttgart.





Small yet extremely effective: A 1:4 scale model demonstrates the effect certain underbody designs or wheel sizes, for example, can have on the aerodynamics of a medium-sized SUV. Chenyi Zhang and Max Tanneberger, scientific staff at the Institute for Vehicle Technology Stuttgart, and Dr. Juliane Nies from Röchling Automotive can use this model to test their innovative concepts quickly and under realistic conditions.

The aerodynamics of a vehicle as well as its weight have an effect on fuel consumption, especially at higher speeds. If its aerodynamic design is optimized, this can have a positive effect on energy use, exhaust emissions, and noise emissions. High-quality simulation and modeling methods play a key role when looking at the overall system.

Highly-Appreciated Professional Discussions

Röchling Automotive has therefore worked with the Research Institute of Automotive Engineering and Vehicle Engines Stuttgart (FKFS) and the Institute for Vehicle Technology Stuttgart (IFS) at the University of Stuttgart to develop a generic AeroSUV to carry out feasibility studies. It is a 1:4 scale model which allows researchers to carry out detailed flow simulations and wind tunnel tests – independently of any given car manufacturer. “We have had a close and trusting relationship with Röchling Automotive for many years, as the company regularly uses our facilities to carry out wind tunnel tests. We appreciate our professional discussions and the support provided,” says Dr. Felix Wittmeier, Head of the Model Wind Tunnel and Wind Tunnel Research unit at FKFS.

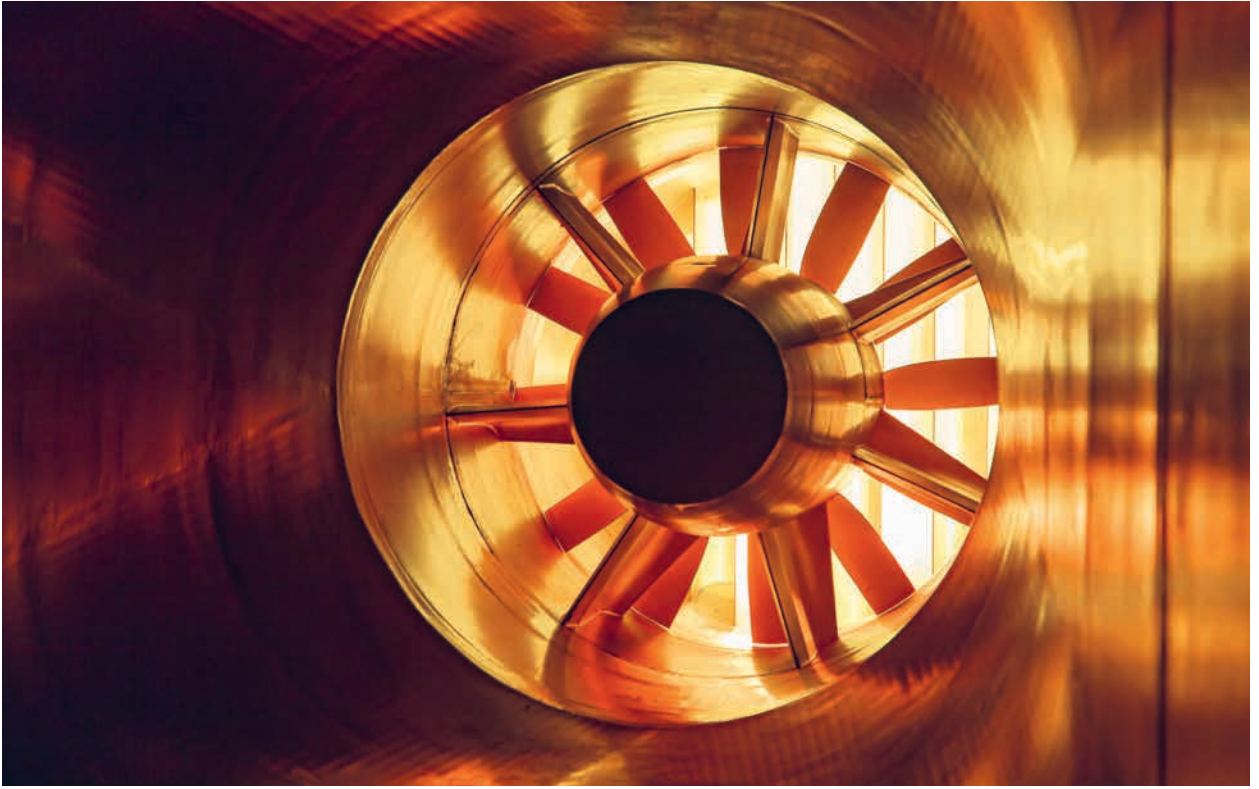
As the name AeroSUV suggests, this solution focuses on SUVs. There is a reason for this – sport utility vehicles achieve the largest share of the global car market year after year. The AeroSUV demonstrates the effect different tail versions, underbody designs, ground clearances, or wheel sizes, for example, can have on the aerodynamics of a medium-sized

SUV. Simulations can be carried out simply, realistically and quickly to test out innovative concepts.

For example, tests carried out on the AeroSUV in the small wind tunnel concern the airstream at the rear of the vehicle – the so-called trail. New tail versions can be assembled on the model relatively easily in order to identify differences in the aerodynamics. Stereo PIV (particle image velocimetry) – a laser optics measuring method – is applied here. This uses small liquid droplets in the airstream in order to make the local airstream speed visible and measurable. “This is a state-of-the-art process, helping us to keep our finger on the pulse in terms of research,” states Dr. Juliane Nies, Teamleader Aerodynamics & Simulations at Röchling Automotive. She has a good working relationship with her scientific colleagues in Stuttgart and comes into contact with them regularly at trade conferences. “Röchling Automotive really benefits from this exchange of information, since the scientists at FKFS and IFS have been conducting research in the field of automotive aerodynamics for many years, and they have in-depth knowledge and are valuable professional discussion partners,” explains Nies.

Requests from Germany and Abroad

The AeroSUV is an open access solutions and so it also promotes the exchange of information with the professional world. The idea is that every user can access the geometric data and use it as they wish. In return, every user will ideally publish their own measurement and simulation results, giving something back to



The model wind tunnel is a closed-circuit Göttinger-type wind tunnel. It is designed so that the air is conducted through a nozzle and over the measuring section and vehicle. Behind the measuring section, the air is suctioned off by a blower (photo) in a collecting funnel. From here, it flows through a channel back to the nozzle in front of the measuring section. The physical properties of the air can be easily controlled in this closed loop.

those involved. "This was important to us, because we want to establish the model as a research basis for the wider scientific community and make it available to companies too," explains Wittmeier. The published results can then be traced by others and used in turn as a basis for their own investigations. "We have already received a few requests for the model from Germany and abroad, both from universities and research institutes and from OEMs," reports Wittmeier.

As an independent civil law foundation, this cooperation is an important pillar of FKFS' business model. The unit head explains that this not only ensures the institute's long-term future, but also allows young scientists to research exciting doctoral topics that are currently sought after in the industry. "Our collaboration with Röchling is really good. We have common objectives, as has been demonstrated time and time again in the AeroSUV project. And we appreciate our excellent communication above all else."



Dr. Juliane Nies observes the airstream phenomena in the model wind tunnel, which can be made visible by introducing steam, for example. The temperature of the airflow is kept constant using a heat exchanger in order to ensure the stability of the model. This is made of plasticine.



Cooperative, Innovative, Successful

Office for Innovation and Technology of the Autonomous Province of Bolzano – South Tyrol, Italy

The South Tyrol provincial administration consists of 14 units, which are broken down into different departments. The Office for Innovation and Technology is based in the Innovation, Research, Universities and Museums department. Its main responsibility is to provide targeted support to increase the productivity of companies with production operations based in South Tyrol, thereby improving their ability to compete on a national and international level.

AUTONOME PROVINZ
BOZEN - SÜDTIROL

Abteilung 34 - Innovation,
Forschung und Universität
Amt 34.1 - Amt für Innovation
und Technologie



PROVINCIA AUTONOMA
DI BOLZANO - ALTO ADIGE

Ripartizione 34 - Innovazione,
Ricerca e Università
Ufficio 34.1 - Ufficio Innovazione
e tecnologia

Experts and futurologists agree that autonomous driving is set to radically change how we travel. However, various requirements need to be met so that cars can actually get themselves from A to B. For instance, additional sensors and cameras are required in the vehicle and they must be free of dirt, rain, and snow to operate safely and reliably. That is why Röchling Automotive has developed the new Advanced Active Cleaning System (AACS), marking an active approach to tackling the question of safety in automated driving.

The intelligent sensor cleaning system enables the targeted cleaning of dirty zones as required. It is characterized by its low weight and – thanks to its modular concept – high flexibility. “The system therefore supports vehicle manufacturers in the transition phase to fully autonomous driving,” explains Fabrizio Chini, Head of Advanced Development Propulsion at Röchling Automotive Laives in South Tyrol, Italy.

Automotive Funding Priority

In South Tyrol, innovative systems such as the AACS stand a very good chance of receiving government backing in the development phase. “Our funding is aimed at companies in South Tyrol that are manufacturing, conducting research and development, implementing innovative projects and thereby strengthening our region,” explains Dr. Franz Schöpf, Head of the Office for Innovation and Technology. In 2019, 707 companies submitted funding applications, 630 of which were granted an overall total of 27.2 million euros.



Looking at the details: Dr. Franz Schöpf takes a closer look at a few tests at Röchling Automotive Laives. His Office for Innovation and Technology promotes innovative companies in South Tyrol, including Röchling Automotive.

The automotive sector, which employs a total of 3,500 people in South Tyrol, is one of the funding priorities. The automation sector is equally important. “We are focusing on Industry 4.0,” explains Schöpf. He says that his office is using targeted measures to incentivize companies to conduct more research and development. A study by the Bolzano Chamber of Commerce has shown that innovative companies are on course for growth, are employing additional qualified personnel, have better profit margins and are attracting new customers and markets. However, the country is also benefiting because high competitiveness contributes to a prosperous economy and therefore has a significant impact on the wealth of the region and its inhabitants.

For Schöpf, one thing is very important here: a close-knit innovation network has to be in place between companies and institutions first to put research and development activities on the right track. This is why projects that involve cooperation between individual companies or between companies and research establishments represent a priority for funding. According to Schöpf, this kind of cooperation enables the broadening of expertise and the wide use of technical and organizational solutions.

NOI Techpark – Driver of Innovation

In addition to companies, the Office for Innovation and Technology therefore funds research and development establishments – which then also benefits companies indirectly. The NOI Techpark in Bolzano plays a strategic role in this respect. It supports companies as a driver of innovation for the implementation of innovations as well as the specific execution of research and development projects. The NOI Techpark is also home to 30 research laboratories that are equipped with the latest technologies and can be used by companies.

“We consider innovation and technology funding attractive not only for economic reasons, but also due to the networking with other companies and research establishments,” says Chini. The most important research establishments include – in addition to the technology park – the Free University of Bozen-Bolzano, private research center Eurac Research and Fraunhofer Italia.

According to Chini, constructive and partnership-based cooperation is essential for joint projects to succeed.

“We are transparent in our activities and the Office for Innovation and Technology is transparent in its decision-making. We are two completely independent organizations but we are united by mutual trust. This is based, above all, on the fact that neither party has ever broken this trust in the past. We have a good opinion of each other; it is as simple as that,” says Chini. Schöpf is of the same belief: “Röchling is an important company for South Tyrol. It has enormous innovative potential, possesses strong roots in the region and provides a lot of jobs. We have approved many of its funding applications in the past.”

A Boost to Innovation

In addition to the AACS, these include several components of the SCR (selective catalytic reduction) tank developed by Röchling Automotive, which makes diesel vehicles cleaner. Funding has also been provided for the development of high-temperature materials, chemically resistant materials and a bio-based polymer. A range of particularly innovative technologies have also been classified as worthy of funding, including various types of blow molding, filtration, sound design, projectile injection technology, hot air and laser technologies as well as infrared welding.

Based on the funding application figures, companies in South Tyrol invested a total of 65 million euros in innovations in 2018. In 2019, this figure stood at 81 million euros – an increase of 24 percent. Schöpf believes that the country is on the right track, saying, “These are exactly the kind of results that we want.”



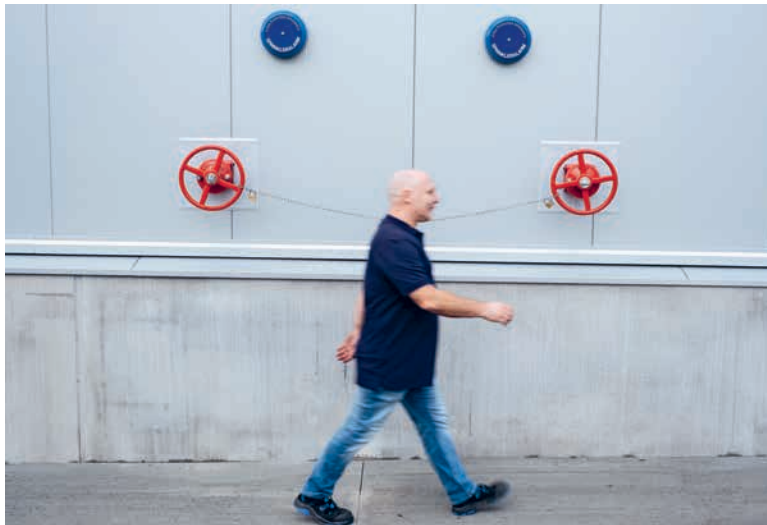
Fabrizio Chini (right) heads up the Business Unit Advanced Development Propulsion at Röchling Automotive Laives, Italy, and monitors the development of the Advanced Active Cleaning System (AACS) closely. He explains the latest results and future course of action in a conversation with Dr. Franz Schöpf at the test facility. The intelligent sensor cleaning system is being optimized here, and will enable the targeted cleaning of dirty zones on a vehicle as required, such as the cameras. This will play a particularly key role in autonomous driving. The project is funded by the Office for Innovation and Technology. It meets key criteria as it incorporates considerations such as safety and the environment. It is also a high-tech product that may help to attract skills and qualified staff to South Tyrol. Röchling Automotive's objective is to use products such as the AACS to promote its growth, not least in Laives.

**Where
Safety
Is a Top
Priority**

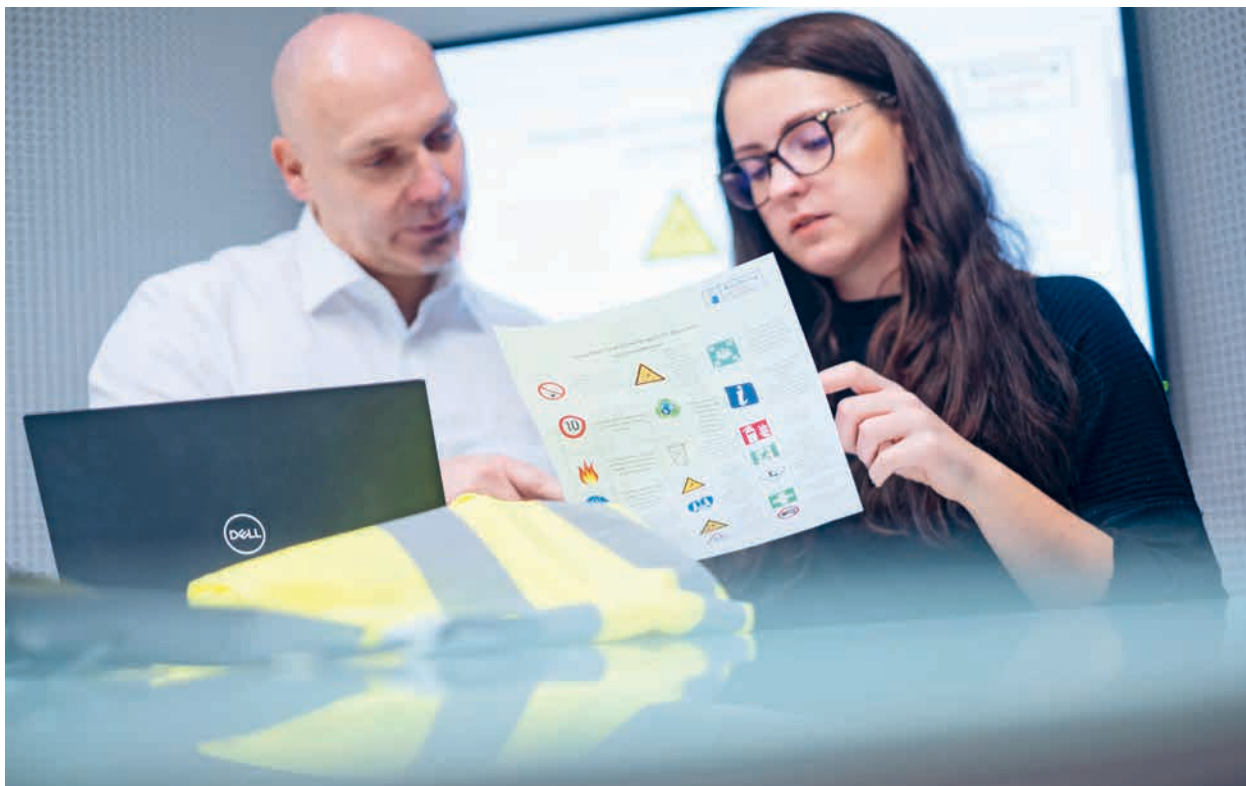


Thorsten Schuch always keeps safety, health and environmental protection in mind – for example, when inspecting production machines at the Röchling Automotive plant in Worms, Germany.

“How will a truck driver from an outside company know that he’s not allowed to smoke in his cab while on our business premises? And how will he know which receptacle to use to dispose of his coffee cup?” These are good questions. A small group of people in a conference room at Röchling Automotive Worms, Germany, are in the process of revising the company’s entry permits and visitor management system – one of what feels like a thousand topics that land on Thorsten Schuch’s desk every day. As Environment, Health and Safety (EHS) Officer for Röchling Automotive’s sites worldwide, he is the man when it comes to safety.



There are a number of different parameters at the Worms plant that ensure safety. These two red valves form part of a sprinkler system that is triggered by an alarm system (blue) in the event of a fire. The sprinkler system is an automatic fire extinguishing system that ensures that a potential fire does not turn into a major blaze.



Thorsten Schuch discusses with student trainee Angelina Rau the revision of the environment and safety leaflet that every visitor to Röchling Automotive receives before setting foot on the plant premises or office buildings.

A thousand topics – his working days really are this varied. His morning meeting on this particular Monday in Worms is a home fixture for Schuch, because this is where his desk is located, in Röchling Automotive's Technical Center. In this open-plan space, sales staff are seated alongside development engineers, marketing specialists alongside quality management experts – and the EHS team can be found right in the midst of them. Schuch

appears well-informed during the discussion, even when faced with detailed questions. They need to clarify the way in which entry to and exit from the company's worldwide plant locations will be organized in future. The entire system needs to be secure above all else – unauthorized access to the premises must be excluded as far as possible. At the same time, these new regulations must not give rise to excessive bureaucracy.

In the end, the group decides to produce a set of easily manageable work instructions in the first instance, which can then be used as a basis for developing a subsequent process.

"That's the way things go quite often," says Schuch. "They appear fairly simple and straightforward, but when you take a closer look, they suddenly become very complicated and multifaceted." In many cases,

Top Priority: Sustainability

The Röchling Group has established an interdisciplinary team, which aims to develop a sustainability strategy for the entire company on a cross-divisional basis. Thorsten Schuch represents Röchling Automotive in this working group. Like the Industrial and Medical divisions, Röchling Automotive's key sustainability objective is to conserve resources and limit emissions in its business activities. For example, it plans to lower its energy consumption further and cut its CO₂ emissions significantly over the next few years. This will require innovation and investment, but also a change in the division's way of thinking and approaches. Green energy and electric cars for the company vehicle fleet are just two keywords here. Röchling Automotive is also involved in voluntary initiatives in its effort to become more sustainable, such as the Carbon Disclosure Project founded in London in 2000. The aim of this is to encourage companies and municipal authorities to publish their environmental data. The Röchling Group published a sustainability report for the first time last year.



Clear boundary: this wide strip with two yellow lines runs along one side of the area where forklift trucks and other vehicles move around the factory site – pedestrians must take extreme care here.

a detailed process then has to be established that sets out binding regulations for all global locations on how to proceed in relation to specific matters. Developing these processes is one of Schuch's main responsibilities, and so he can often be found at his desk, usually as early as 7 in the morning, discussing and coordinating projects with his specialist colleagues. He also produces work instructions, documents, templates, and technical specifications, which then enter into force worldwide.

Special Expertise through Environmental Protection Studies

The 51-year-old more or less stumbled into the overall field of safety, ranging from health protection and occupational safety to environmental protection. Schuch studied plastics technology in Darmstadt, Germany, and initially worked on projects and the development of complete production lines at Röchling Automotive. From 2010 to 2013, he was in charge of technical training within the Röchling Automotive Group. He studied for a distance-learning master's degree in environmental protection from the University of Rostock, Germany, alongside his job, which he completed in 2006. This was his "way in" when Röchling Automotive was looking for a manager for the EHS division.

Schuch greets a number of colleagues over lunch in the canteen this Monday – his job involves getting to know lots of different employees, since health, safety, and occupational protection are issues that affect everyone. He is also looking after a colleague from the USA today, who arrived a few hours ago and is due to attend the meeting of the Steering Committee scheduled for the next day. The Steering Committee's global EHS regional managers meet twice a year in different locations – this time in Worms. They work together to prepare global internal guidelines and the annual Management Review which informs the Management Board about all relevant EHS issues.

Global Internal and External Audits

After lunch, Schuch is due to head to the Technical Center for a meeting with his EHS colleague Tobias Ries to discuss audit planning. Who will conduct internal audits over the next few months, which internal audits will they carry out, in which locations, which external audits will they conduct, and who will be in charge of them? A quick glance at the colored bars used to indicate any two to four-day studies is all they need to tell them that they are both going to be on the road a lot. Schuch spends around

150 working days a year somewhere around the world, from Gijzegem in Belgium to Kunshan in China. ISO 14001 and 45001 – these are the international standards relating to the environment and occupational safety, and Schuch knows all about them.

"Environment and occupational safety in the supply chain – these have been central themes for our customers for many years. We have to prove in external audits just how good we are at these things," explains Schuch. However, he has also seen in recent times that more and more value is being placed on sustainability themes and social issues. The awarding of contracts now includes a sustainability questionnaire as standard. And social audits are used to check, for example, whether collective bargaining agreements are observed and whether legal regulations concerning holiday and working hours are followed.

Each Röchling Automotive location is subject to an internal audit at least once a year. Here, Schuch and his colleague check whether statutory requirements under the relevant state law and internal guidelines are being observed. "We always try to introduce and adhere to a particularly high Röchling standard, whatever the loca-



Involving and Motivating Employees

Employee participation is a key requirement of occupational health and safety standard ISO 45001. In order for employees to get involved, they need to be made aware of the significance of the issue in the first place, which is why Röchling Automotive uses global campaigns to promote an EHS culture within the company. Every month, all locations worldwide focus on and highlight a specific theme relating to occupational safety, environmental protection, or health protection.

Global Safety Week is held once a year, which was awarded the Innovation Prize from the German Social Accident Insurance Institution for the raw materials and chemical industry (BG RCI). During Safety Week, employees can complete a questionnaire and state their opinion on occupational health and safety issues. Medical examinations, safety training sessions, and a range of other training exercises are also offered.

The employee survey conducted once a year and regular site visits ensure that all employees are involved in this process as much as possible. Every employee also has the opportunity to submit improvement suggestions. Since 2018, the four locations that have achieved above-average improvements in the area of EHS have been awarded an internal EHS Award. This primarily concerns measures taken to reduce waste, energy consumption, unplanned absences, and accidents at work.



Cycle times in production at Röchling Automotive are short, meaning it is all the more important to ensure that all facilities are safe. The Steering Committee's global EHS regional managers have seen to it that all large machines are equipped with a special conductor, an anti-fall grate and automatic shut-down devices – a multi-million investment for Röchling Automotive.

tion. Our main aim is to find the best solutions for our employees within acceptable limits in terms of business and organizational requirements,” says Schuch.

Minimizing Risks from the Outset

A debrief is carried out with the local management after each internal audit, where Schuch presents the results of his investigation. Not only is he responsible for planning and conducting

internal audits and monitoring external audits, he is also responsible for the results and implementing improvements. In order to minimize risks from the outset, whether they relate to occupational safety or environmental protection, it is important to have a well-informed and highly-aware workforce upon which to build, which is why staff training sessions are held regularly. These are usually run on site by EHS staff.

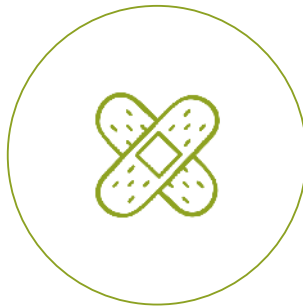
Following his audit planning meeting, Schuch heads quickly over to a meeting room in a side building next to the production halls. Seven safety officers are already assembled here for their meeting which is held every 14 days. If anyone knows how things work in practice, it is them. They discuss matters at hand openly and animatedly, and this discussion sometimes gives rise to controversy. In these meetings, the safety

Röchling Automotive's EHS Focal Areas



Environmental Protection

Waste sorting, handling substances harmful to water quality, energy efficiency, CO₂ reduction



Health Protection

Reducing health risks in the workplace, such as through improved ergonomics and lighting



Occupational Safety

Providing safe machinery, appropriate personal protective equipment, approvals, risk assessments

officers see themselves first and foremost as a mouthpiece for their fellow employees and they represent their interests. Schuch is also committed to the management of the company and always stays focused on what is feasible.

Employee Motivation as a Central Task

Regular safety meetings like this one, inspections, training sessions, information campaigns, internal and external audits – these are the key components of safe operations. “The most important, but also the hardest, part of my job is motivating employees to be mindful of health and safety and to internalize these issues,” explains Schuch. He states that observations and information provided by staff in terms of safety are always taken very seriously, promoting an open feedback culture. The relationship between safety

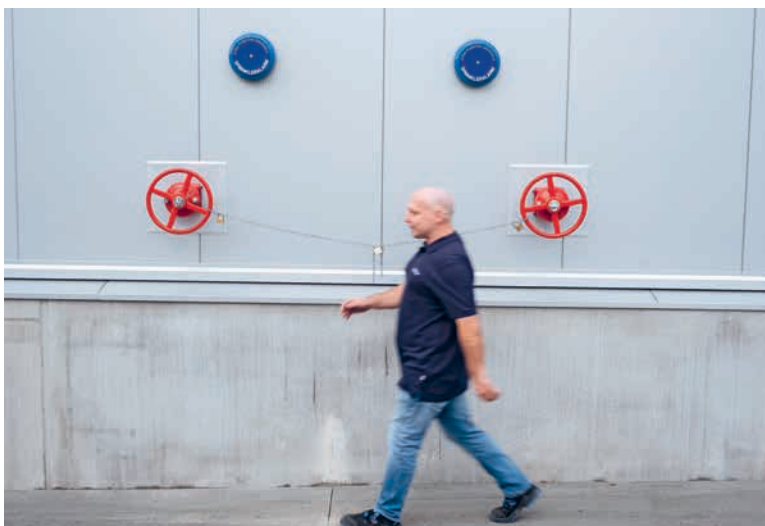
officers and employees is one of trust and is based on convincing them with strong arguments. “Failing that, I do sometimes have to issue instructions,” says Schuch. He explains that occupational safety and environmental protection starts with each individual. However, management should always lead by example, from line managers right up to the Management Board.

Represented in Key Committees and Groups

In addition to employees and management, Schuch is also in regular contact with customers in order to get to know their precise requirements, especially with regard to sustainability. For example, he regularly attends a working group of the German Association of the Automobile Industry (Verband der Automobilindustrie – VDA) as Röchling Automotive’s representative. He

serves as Röchling Automotive’s representative at the German Federal Ministry of Labor and Social Affairs in discussions concerning human rights in the automotive industry. He is also a member of the Round Table of the German Automotive Industry on the theme of human rights. “It’s important to attend these committees because this is the only way we can help to shape these topics to a certain extent.”

At the end of his working day, Schuch gets in his car and drives to Frankfurt Airport to collect two employees who are arriving from Italy and China to attend the Steering Committee meeting. There will be a get-together with international colleagues in the evening. Schuch is looking forward to this – and the next day, where safety will be top of his agenda yet again.



Medical

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

172

million euros in sales

6

locations

1,192

employees

Never Lose Track

Quality must always be ensured, but especially in the sensitive field of medical technology. At Röchling Medical Waldachtal, Germany, staff pay close attention to this at various stages in the process. Larisa Colceriu, clean room production employee, uses a magnifier to carry out an inspection during the production process.



Out of sight, out of mind – this saying does not apply to product manufacturers. On the contrary – they carry on working on their products long after they have been delivered to customers. There are a number of reasons for this, ranging from warranties and product liability to quality control. This is also a highly relevant issue for Röchling Medical.

Anyone who manufactures goods and products must by law ensure that they are traceable – in other words, they must take measures to ensure they do not lose track. This is the only way they will be able to retrace, at any given moment, where, when, by whom and how a product was obtained, manufactured, processed, stored, transported, used and disposed of. This is particularly important in sensitive areas such as the food industry, medical technology and automotive, train and aircraft construction. Safety is the number one priority here.

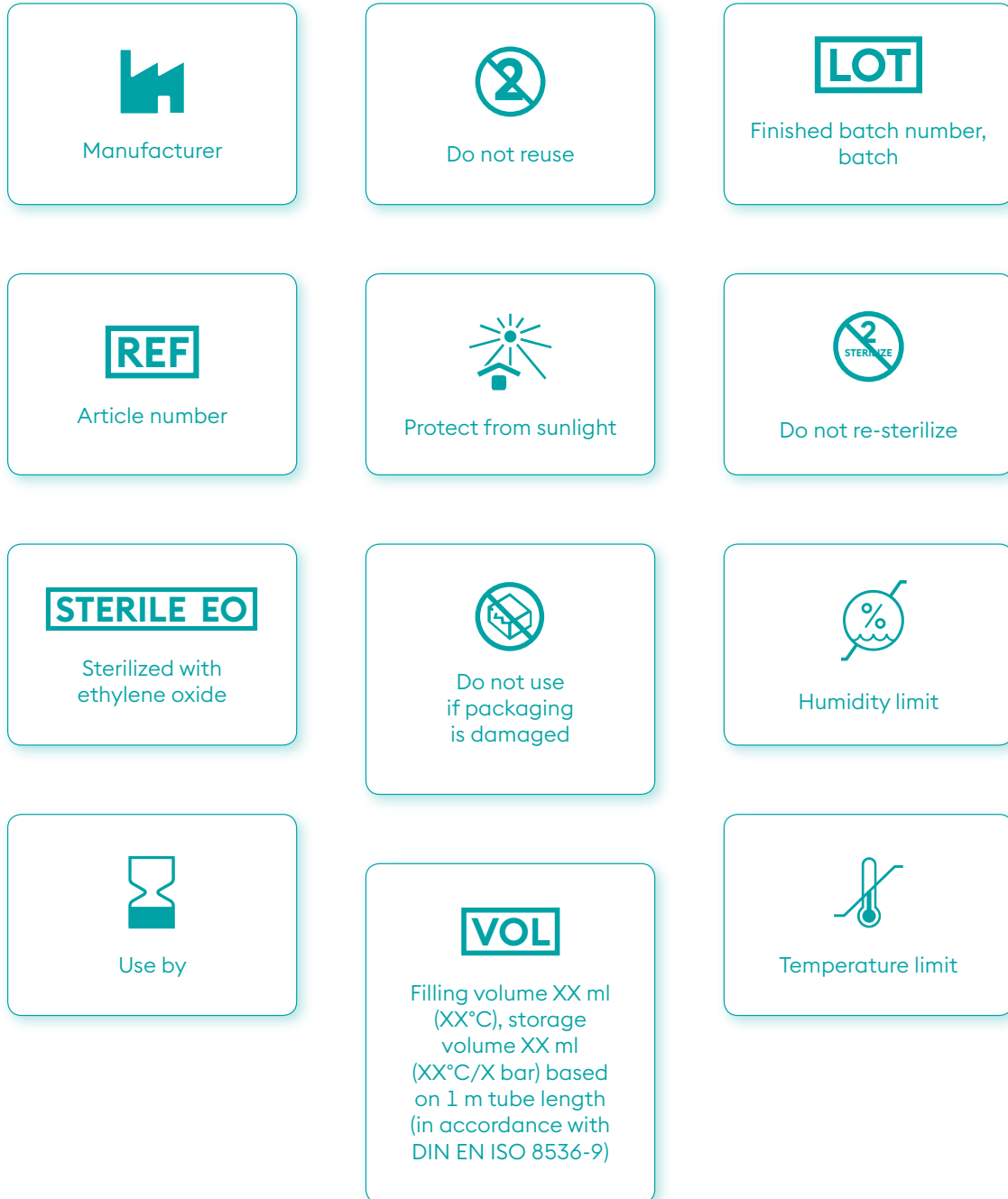
Traceability works in two directions: “Upstream traceability” means that products or materials can be traced back to the producer based on ingredients or features of the manufacturing process or product itself. Conversely, “downstream traceability” allows manufacturers or distributors to trace products right up to the end consumer. This ensures that products can be recalled if quality defects are identified at a later date.

Full traceability is also essential when it comes to product liability. As a general rule, if the use of a product by a user or customer results in injury to persons or damage to property or assets, the company that placed this product on the market

will be liable. However, companies that did not place the product on the market, but were involved in its production, are not generally able to extricate themselves from the situation, since they will have signed strict quality assurance agreements and corresponding contracts with distributors in the vast majority of cases.

The sensitive area of medical technology is where Röchling Medical Waldachtal, Germany, calls home. The company develops and manufactures plastic products and entire assemblies for various medical technology applications, such as in the area of cardiology, intensive care, dialysis and surgery. These include breathing tubes, instruments for eye operations, vacuum mixing systems for bone cement and laparoscopy instruments. Röchling Medical Waldachtal either manufactures products for distributors – in other words, for medical technology companies which produce an end product from these products and mainly supply doctors and hospitals – or it acts as an OEM (original equipment manufacturer), whereby it manufactures products on its own authority and delivers these directly to doctors or hospitals on behalf of its customers. The majority of products manufactured at the Waldachtal site are single-use instruments.

Detailed Labeling – Complete Traceability







Claudia Ganszki, quality assurance employee, and Pascal Singer, clean room production team member, discuss production and quality planning for series production.

Medical Device Regulation (MDR)

The provisions of the EU Medical Device Regulation (MDR) adopted in 2017 relate to all medical product manufacturers – and therefore also concern Röchling Medical Waldachtal. Some of the main new developments contained in the regulation are given below:

<p>Extended Scope of Application</p> <p>The scope of application of the MDR has been extended and now also comprises, for example, products without a defined medical purpose, such as implants for aesthetic purposes.</p>	<p>Strict Monitoring</p> <p>The MDR ensures strict clinical monitoring of medical products following distribution. Unannounced audits, random sampling and product testing help to reduce the risk posed by unsafe medical products. Manufacturers must submit annual reports on the safety and performance of their products for defined product groups.</p>	<p>New Classification</p> <p>The MDR provides for a reclassification of products according to risk, contact duration and invasiveness. Manufacturers must therefore review the new classification rules and update their technical documentation accordingly. Manufacturers who do not have sufficient clinical evidence to demonstrate the required safety and performance of a particular device or appliance must conduct clinical investigations.</p>
<p>Unique Device Identification</p> <p>The MDR calls for a system of unique product numbers (unique device identification, UDI). This allows manufacturers and authorities to recall medical products that pose a safety risk more quickly and efficiently. This will automatically enlarge the European database on medical devices. It is also easier to access information on approved medical products.</p>		<p>Re-Certification</p> <p>According to the MDR, all currently approved medical devices must be re-certified in accordance with the new requirements.</p>



A well-trained eye: Doreen Möhrle's main responsibilities include highly focused and detailed quality control testing of products.

For Röchling Medical Waldachtal, ensuring traceability of its own products is an essential part of the quality process. This helps it to carry out error analyses, satisfaction analyses, and quality evaluations, allowing it to determine whether a product is actually meeting expectations in practice. "For us, traceability predominantly means identifying the performance of our products and staying in close contact with our customers to ensure the quality and practical suitability of products throughout their service life," explains Dominic Garrecht, Head of Quality Management and Regulatory Affairs. All feedback is useful for

Röchling Medical Waldachtal – whether it is from customers or end users – as it allows the company to identify errors at an early stage and optimize production processes. Feedback makes it possible to take preventive measures, prevent quality deviations and make improvements where necessary in future production batches.

Prevent and Care

Röchling Medical Waldachtal sees itself as a reliable, trustworthy and responsible partner to its customers. "We offer safety and actively protect our customers from risks. That's our aspiration,"

says Quality Manager Garrecht. The earlier defects are discovered, the quicker they can be handled – in the best case scenario, the customer will not have even seen, processed or sold the product by this point in time. “We prevent and we care. Our customers have learned from experience that they can rely on us,” explains Garrecht.

Hendrik Liebau, Managing Director of Mecus GmbH, is of the same opinion. His company develops and distributes innovative medical products. Röchling Medical Waldachtal is commissioned to manufacture these products. “Here at Mecus, patient safety is our top priority. Our company is 100 percent responsible for this and only outsources key processes when we know we can rely on the partner in question,” says Liebau. He explains that working together allows them to ensure the safety of medical products on a lasting basis. “We have a partner in Röchling Medical Waldachtal that understands this responsibility and whom we trust,” states Liebau.

Goods and products must be reliably labeled so that they can be traced in practice, which is why Röchling Medical Waldachtal uses laser systems, among others, to mark its products.

This marking consists of a ten-digit number which can be used to access all relevant information electronically, such as the ingredients of the plastic used, machine data, measurement results and procedures. “This unique device identifier code ensures that products can be assigned quickly and isolated easily in the event of any problems,” explains Garrecht. This is very important for a company like Mecus. “We need to be able to track production processes consistently at all times so that we know when individual components were assembled and during which work step. We also have to document each development step in the product file so that it can be traced, from the initial idea and design to being handed over to production,” reports Mecus’ Managing Director Liebau.

In addition to a wide range of legal requirements that medical technology companies must observe, there are also specific quality assurance agreements that Röchling Medical Waldachtal concludes with its customers. Whether it’s on a legal or individual basis – safety is a key issue each and every time, which is also examined in regular audits. Certainly, for product manufacturers this saying applies very well: trust is good, but control is better.



Patrick Haese is Team Manager Measurement Technology. He and his team use state-of-the-art machinery to produce exact measurements of medical products. This means any production errors can be identified immediately or ideally prevented altogether.



It must be possible to retrieve anything in the warehouse straightaway: Jens Haigis is a logistics employee and uses a laser to scan the labels on cardboard boxes containing products. He then uses an internal transport vehicle to transport the boxes to their position on the warehouse shelf – or to retrieve them from the shelf.

Expert Customer Support on the Road Towards the MDR

The EU Medical Device Regulation (MDR) officially came into force in May 2017. There was a transition period of three years for medical product manufacturers, during which they have had chance to prepare for the new regulations. The main challenge here was adjusting to a significantly increased workload. Röchling Medical Waldachtal supported its customers in a variety of ways in this process – and continues to do so.

Good Preparation

Back in 2017, experts from Röchling Medical Waldachtal launched a preparation and coordination program, which has now been completed. In collaboration with the respective customer, they produced a plan for the regulatory and specific requirements that this customer would in future impose on Röchling as a manufacturer in order to comply with the provisions of the MDR. They worked as a team to establish how this would be implemented in practice.

Internal Training

Röchling Medical Waldachtal also had to make internal preparations for the introduction of the MDR. Employees were made aware of the topic and familiarized with the regulation in training sessions. Measures included internal presentations, practical tasks based on examples of how it would be implemented, workshops and lectures given by external experts.

Individual Support

Röchling Medical Waldachtal's customers include seven of the ten largest medical product manufacturers in the world, as well as small and medium-sized enterprises and young start-ups. Röchling Medical Waldachtal has provided each of its customers with individual support to help them implement the MDR. This included support with issues such as technical documentation, unique device identification (UDI), traceability and approval procedures. However, the real work is only just getting started, since technical documentation is an ongoing process and will continue to be overseen by Röchling Medical Waldachtal.

Clinical Trials

The MDR calls for clinical trials to be carried out on far more products than before. This will lead to bottlenecks, especially in clinics lacking the infrastructure required for medical technology trials. Furthermore, the number of patients who meet the requirements to take part in a trial is often very limited. Röchling Medical Waldachtal is working hand in hand with clinics to help them meet this challenge.

Satisfied Clients

Röchling Medical Waldachtal actively supports its customers with regard to product and process queries and provides documentation as required by the customer. Mecus' Managing Director Hendrik Liebau: "When you don't develop and manufacture your medical product in-house, you need a reliable and competent partner. In collaboration with Röchling Medical Waldachtal, we were able to get to grips with the challenges posed by the MDR at an early stage."

Adherence to Deadlines

Many experts have complained that the transition periods for switching over to the new EU Regulation are too short. Small and medium-sized companies have been faced with particularly significant challenges on account of their financial and human resources and the time they have available. With its range of products and services and its network, Röchling Medical Waldachtal helps its customers to implement projects, even when resources are critical.

The Perfect Cut

The World Health Organization issues regular warnings: growing numbers of people, including children, are overweight, especially in the industrialized nations. For those who suffer from obesity, stomach-reduction surgery is often their last hope of losing weight on a long-term basis. In close collaboration with Röchling Medical Rochester, USA, the U.S. start-up Standard Bariatrics has developed a surgical instrument with which this stomach operation can be performed uniformly, safely, and efficiently.





Dr. Jonathan Thompson is a surgeon and an expert in stomach reductions. In 2014, he used his experience to found Standard Bariatrics and, together with his team, developed the STANDARD CLAMP™. He is the company's Chief Medical Officer.

The patient lies on the operating table under general anesthetic. A surgeon makes several small incisions in the abdominal wall, and inserts the surgical instruments and a camera into the abdominal cavity. This minimally invasive method, also known as laparoscopic surgery, has a clearly defined objective: a large portion of the stomach is removed so that the patient can eat less and feel full more quickly in the future, thus losing weight. Other benefits include improvements in co-morbidities including hypertension and insulin resistance.

No Need for Manual Stitching

Next, the surgeon uses a stapler to resect the lower section of the stomach. At the same time, the device automatically applies surgical staples along the incision. These staples connect the wound edges and seal the stomach tube that remains. The advantage of this technique is that it eliminates the need for manual stitching. The separated stomach portion is removed from the stomach cavity via an extraction bag. The remainder of the stomach is filled with air. If bubbles occur at the suture line, the seam is not tight. If no bubbles occur, the operation is complete. Assuming there are no complications, the patient is usually discharged within one day.

The sleeve gastrectomy operation described is the most commonly performed surgical stomach-reduction procedure in the world. A narrow tube with a width of two to three centimeters and a capacity of 100 to 150 milliliters is left inside. By way of comparison, a normal stomach can hold around two to three liters. Stomach volume is not the only thing that is

smaller after the operation. As the removed portion of the stomach generates the appetite-stimulating hormone ghrelin, the patient is less hungry. A stomach reduction is irreversible.

A stomach-reduction operation takes just over an hour, but is extremely challenging: the seams must be tight to ensure the stomach contents do not seep into the abdominal cavity. It places high demands on surgical skills – technical assistance is required. This assistance is provided by an innovative clamp that has been launched by Standard Bariatrics, Inc., based in Cincinnati, USA. The U.S. company specializes in the development and marketing of medical products for surgical treatment of obesity.

Operation Is Most Effective

Standard Bariatrics was established in 2014 by Dr. Jonathan Thompson, a surgeon and expert in bariatric surgery. As Thompson is well aware, obesity is becoming increasingly prevalent worldwide year by year. If a change of diet and more exercise fail to achieve the desired results, the operation is the most effective treatment solution. “That’s why our company focuses on developing surgical solutions that can optimize the sleeve gastrectomy surgical procedure,” says Adam Dunki-Jacobs, Chief Technical Officer and Vice President of Engineering of Standard Bariatrics. He is part of the five-strong management team with a combined total of over 175 years’ experience in development and marketing of innovative technologies for medical products.



Rebecca Signorino is a contract manufacturing coordinator at Röchling Medical Rochester. She uses a torque driver to install the smallest components in a sub-assembly.

Once the sub-assembly is complete, it is inserted into a tube. Assembly of the STANDARD CLAMP™ is complex and takes place in the clean room.



The next step sees Rebecca Signorino place the plastic components, which have been injection-molded by Röchling Medical Rochester, into a fixture to create the handle of the STANDARD CLAMP™.



All instruments are placed into a bin straight after completion.

The new instrument, the only one of its kind on the market, is called STANDARD CLAMP™, and is available in lengths of 22 and 25 centimeters. With the single-use instrument, the surgeon can secure the entire line along which the stomach is to be transected. Before the stomach is transected, the anatomical outcome of the intervention is displayed for the surgeon. Once everything is in order, a single straight transection is made, with no jagged edges or zig-zags, which can lead to post-operative complications. Four to five stapler firings are usually enough to seal these smooth seams – conventional instruments need six to eight. This leads to a cost savings in stapler firings and improvements in post-operative outcomes.

Standardization at a High Level

In contrast with "free-hand" operating techniques, cutting of the stomach with STANDARD CLAMP™ always proceeds along three defined reference points. Consequently, the surgeon finds the ideal anatomy of the gastric sleeve – with no kinks, twists, or spirals. "Our instrument helps to standardize individual operating techniques at a high level," says Dunki-Jacobs. This standardization ensures better operating outcomes, fewer deviations, greater efficiency, and lower procedural costs – all without increasing the operating time.

Röchling Medical Rochester is responsible for manufacture of the new instrument. The company's services extend from part development and production to assembly of medical products. Along with instruments for minimally invasive surgery, the firm also focuses on labora-

tory and diagnostic equipment. "When we no longer wanted to produce the STANDARD CLAMP™ ourselves at our plant and were on the lookout for a partner, Röchling impressed us straight away," Dunki-Jacobs relates. Röchling Medical Rochester came across as a quality company with extremely dedicated employees. "Right from the start, the whole team committed wholeheartedly to the task of delivering a high-quality product for our customers, i.e. the surgeons, and their patients," enthuses Dunki-Jacobs. For instance, Röchling Medical Rochester sent several employees to the Standard Bariatrics plant in Cincinnati for two weeks for training purposes.

When choosing a partner, as well as looking at technical expertise and production capacity, Standard Bariatrics assesses factors such as staff retention, working environment, willingness to collaborate effectively, and a shared belief in the product's importance to patients' lives. "As a start-up, it is essential for us to build up genuine, trust-based partnerships in order to avoid unpleasant surprises, particularly with regard to agreed project costs and the end price of the instrument. Only then can we manage our resources effectively," says Dunki-Jacobs.

For the STANDARD CLAMP™ project, Röchling Medical designed and built a customer-specific production line at its Rochester plant and installed it in one of its multiple clean rooms. This clean room is certified and meets the standards of ISO class 8. Röchling Medical also invested in a new heat-sealing unit for sterile packaging. In addition, an

Finally, Rebecca Signorino places the completed product into a tray with a lid that is then sealed with a heat sealer for sterile packaging. Röchling Medical Rochester recently purchased this device for the production of the STANDARD CLAMP™.





Obesity

Physicians refer to significant overweight as obesity. Overweight is a result of energy intake exceeding energy consumption. In other words, the body receives more nutrients, and in particular more fat, than it needs. Obesity is a chronic disease, and must be taken seriously. Those affected usually have an impaired quality of life and often suffer from secondary diseases such as high blood pressure, diabetes, or joint wear. The ever-growing incidence of overweight is having a significant impact on healthcare systems: according to the statistical database Statista, the costs caused by overweight are currently estimated at five to fifteen percent of the entire healthcare costs of Western industrialized nations.

injection-molding machine was fitted with a new mixing nozzle to prevent color streaks in the plastic. All plastic parts are injection-molded from a specially stabilized polycarbonate optimized for radiation sterilization. Consequently, the products maintain the look of the natural material even after sterilization. As always in medical technology, the material is biocompatible, i.e. it has no influence on body fluids or tissue.

Responsibility Lies with Röchling

Röchling Medical Rochester has outsourced production of metal and packaging components, i.e. non-plastic parts. “Ultimately, though, we are responsible for the quality of the complete product,” stresses Jim Andolina, who is the first point of contact at Röchling Medical Rochester for Standard Bariatrics. Röchling Medical paid considerable attention to the complex assembly of all parts. This too is carried out in the clean room, and is a key factor in the perfect function of the instrument during the minimally invasive surgical intervention.

After leaving the plant in Rochester, the STANDARD CLAMP™ is not touched directly again until the surgeon handles it during the operation. Röchling takes on a huge amount of responsibility here. “The product we deliver must be 100 percent compliant with the quality and performance requirements of Standard Bariatrics,” says Andolina. That is why the team in Rochester checks every single instrument thoroughly for aspects such as perfect mechanical

function. One particular challenge is sterile packaging – this part of the production site has been expanded. “We have done a great deal to ensure that we can deliver outstanding results here too,” Andolina maintains. To finish with, properly sterilized instruments are labeled in line with the procedure used – in this case “Sterile R” for sterilization by radiation.

“Our reputation as a manufacturer of medical instruments is on the line whenever a surgeon takes our instrument out of its packaging, no matter how many times they have used this instrument in the past,” adds Dunki-Jacobs. All it takes is one bad experience with the product for the surgeon to consider using another instrument next time. After all, safety is paramount in medical technology.

A functioning quality-management system ensures consistently high quality. That is why, at the start of the partnership, Standard Bariatrics looked closely at how the team in Rochester deals with quality issues and what preventive measures it takes to prevent similar problems from recurring. Regular audits and inspections at Röchling ensure that the quality standards are met in product manufacture. Dunki-Jacobs firmly believes that Röchling Medical is the right partner: “As we are obviously not on site every day, we are reliant on Röchling performing these checks as prescribed and giving us feedback if there is an identified need for additional quality inspections. Our collaboration has shown that our trust is absolutely justified.”



S STANDARD
BARIATRICS™

REF SCD25-1

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 2020-09-19

 Standard Bariatrics
11000 S. 11th Street
Tucson, AZ 85710
(520) 731-1111



011000516710070043

LINKED BY



STANDARD CLAMP Disposable
QTY 1EA



For use only with 5mm or larger CANUSA
The STANDARD CLAMP Disposable is not made
with natural rubber or latex.



1 720099 1111 1 3800191 04000302 129 0111

The STANDARD CLAMP™ is available in lengths of 22 centimeters and 25 centimeters. All plastic parts come from Röchling Medical Rochester and the metal and packaging components from suppliers. Ultimately, Röchling is responsible for the quality of the complete product. Bar codes and identifications provide information about where, when, by whom, and how the product was manufactured, stored and transported. This ensures that its manufacturer, ingredients, manufacturing process, and product characteristics can always be traced.

Coal – Steel – Plastic

Two Centuries of Innovative Materials



From Völklingen to the world: the coal trading company founded by Friedrich Ludwig Röchling in Völklingen in 1822 has evolved into a global plastics group in just under two centuries. During this time, it has become clear that particularly great success is consistently achieved when the company focuses systematically on its own materials with the aim of being a pioneer in this area, thereby becoming a market leader on the basis of its innovations. Röchling's motto is: conquering new markets and regions with innovative materials.

The early coal trade formed the basis for the company's involvement with the rising innovation leader of the industrial revolution: steel. The four nephews of the company founder, known as the Röchling brothers, began producing coke and processing industrial iron in 1849. The company acquired the Völklingen Ironworks in 1881, which marked its entrance into the steel era. Around a century later, Völklinger Hütte was designated the first industrial UNESCO World Heritage Site.

Röchling identified the potential of a new material as early as 1920, and the company became a pioneer in the world of plastics processing. The aim was to lessen its reliance on steel. In 1955, Röchling acquired Rheinmetall Berlin AG, the supplier of the newly founded German Armed Forces. It then diversified the company into other new business fields and said goodbye to the coal and steel industry in 1978. Röchling's main focus in the plastics industry was on internal growth and targeted acquisitions in new sectors, such as automotive plastics, and it established its presence in international markets, particularly in Asia and the USA.

In the new millennium, Röchling focused once again on its materials expertise. The Group severed itself from all holdings that were not related to plastic. With its increased international presence and diversification into new sectors, it decided to focus on its unique material and processing expertise. As always, the Röchlings had confidence in their own abilities and in the skills and commitment of their several thousand employees. This sort of confidence and trust gives rise to consistency – one of the main characteristics that sets this family company apart, right up to this day. At the same time, trust is needed in order to be open to change, and Röchling has demonstrated this open willingness on many occasions throughout its history.

Today, the Röchling Group is the world's leading processor of innovative plastics for technical applications in the industrial, automotive and medical sectors.

Trust – the Key to Future Success

A style of company management based on issuing instructions and following these obediently – this may well be the way things are still done in some offices and factory buildings. Yet HR experts have long been in agreement that a company will only achieve real success when its employees are given a certain amount of freedom, independence, and decision-making powers.





This is why, in many workplaces, time stamp clocks have been replaced with trust-based working hours, compulsory physical attendance with mobile working, to name a few examples. These freedoms require a few things from a manager: the ability to let go, listen, and trust. In the vast majority of cases, employees repay this trust by being reliable, dedicated, and willing to cooperate. After all, anyone who feels that they are perceived as an expert and that they can apply their skills in their own workplace for the benefit of their employer will be more motivated, target-oriented, communicative, and business-minded. All of this promotes corporate success. At the same time, this style of leadership frees up time for management to focus on other important matters.

Reliable and Appreciative

Over the past year, the Röchling Group has introduced new guidelines for leadership based on these findings. These call on managers specifically to place their trust in their teams and promote talented individuals. By the same token, managers need to be reliable so that they can earn the trust of their employees. And they need to be appreciative too. Because appreciation and value creation

go hand in hand. This principle is based not least on the knowledge that trust and appreciation, once lost, are very hard to get back. Röchling regards trust and appreciation as the foundations of solid, motivating and promising relationships between managers and teams – and of corporate success.

The next few pages contain a report on managers at a Röchling plant in China, which demonstrates just how important the themes of trust, appreciation, and reliability are in the workplace. However, these values are also an essential part of people's activities outside their everyday work. Without these values, not only would we lose any sense of social cohesion, but in extreme cases, it would also be a bleak picture when it is your job to save someone's life. This is demonstrated by an account given by an employee of the Röchling Group in Mannheim, who is a member of the volunteer fire service in Landstuhl, Germany. A report about an employee of Röchling Industrial Oepping in Austria, who likes to go diving in her free time, adds further weight to this topic.

Röchling's New Guidelines for Leadership





用人不疑， 疑人不用——

孟子(约公元前370年—公元前290年)

“If you entrust things to someone,
never undermine them with doubts.
If you have doubts in someone, never
undermine yourself by entrusting
things to them.”

Mencius (circa 370–290 BC)



Edward Huang (left), General Manager Operations at Röchling Automotive in Asia, and his colleague Peter Wang, General Manager Sales, both agree: mutual trust improves job satisfaction. A lack of trust has a negative impact on the efficiency and therefore on the success of a team. They are both working towards the same goal.

Röchling Automotive has opened a total of five plants and one engineering center in China since the company first began operations in the country in 2006. The company is also present in other Asian countries and is increasingly competing with local rivals, not least of all for workers. How do you appeal to Chinese applicants as an employer? How do you set yourself apart from other companies? Why do employees remain loyal to your company? Two Chinese managers believe that trust plays a key role.

Edward Huang has worked for Röchling Automotive Kunshan for 13 years. In China, where employees move between companies relatively frequently, that is a long time. And in this time, Huang has made it to the very top, now holding the title of General Manager Operations of Röchling Automotive in Asia. Above all, that means communicating, listening, and making decisions. Every morning, he travels the almost 30 kilometers from his apartment in Suzhou to the plant to Kunshan – unless a business trip flight is on the agenda. These trips make up almost a third of his working hours.

Huang's daily work is made up of regular talks with plant managers, operations managers, and managers, for example from the Quality, Engineering and Logistics Business Units, where they discuss plants and locations in China, Thailand, Japan, India, and Korea. Huang also speaks daily with employees in non-operational areas, from controlling to development to purchasing. In addition,

he holds regular telephone calls and meetings with the German managers of Röchling Automotive in Europe.

Information gathered in these conversations is crucial for the decisions he makes on investments in new projects and plants as well as measures to optimize processes, procedures, and products. He determines how resources are to be used in order to achieve targets. After interviews are conducted for key positions, he also selects staff. "When making all of these decisions, I have to be able to rely on myself, but above all on the expertise and experience of my team. Nothing works without this trust," says Huang. But at the same time he knows that a great deal of trust is also placed in him, both by his own employees and by the management in Germany. His employer's trust plays a pivotal role for him and is one of the main sources of his job satisfaction. "It helps me achieve my goals, overcome challenges, and do the right thing without hesitating."



The two managers from Röchling Automotive Kunshan know that they can rely fully on the expertise and experience of their team. Identifying employees' strengths, setting them realistic goals, and helping them achieve these – this is what Edward Huang and Peter Wang see as their main responsibility.

Huang is fully aware that trust cannot be simply built up and maintained on the sideline. On the contrary – a company has to invest significant time and energy. Charisma is also useful, he adds. When talking to him, it is clear that the 49-year-old has given a lot of thought to these issues. In addition to his MBA, he also holds a degree in applied psychology and so is well versed in the theory and practice. Trust, says Huang, conveys a sense of safety and security. Teams cannot be efficient without trust. “Employees spend most of their day with us. It is our job to ensure that this time is satisfying and that they have enough to do. People who work hard can take a lot of pleasure in their career,” says Huang, referring not least to himself. Friendly interaction, a good word, trusting relationships – all this is what he considers a positive work environment.

He views his role as a manager as identifying employees’ strengths, setting them realistic goals and then helping them achieve these: “Then they’re proud of themselves and they enjoy working at our company.” Of course there are other factors that have to be right, he adds: fair and clear rules, a suitable salary, a strong corporate culture, and the same organizational structures. “People also tend to prefer working for a successful company than one in a crisis,” says Huang.

Long-Term Loyalty to the Company

For him personally, there are just a few pivotal points that explain why he has remained faithful to Röchling Automotive for so long. The first of these is that he

can use his strengths, including his technical and business expertise. Secondly, he values his team and working together with this group of people. Thirdly, he has great trust in and a good relationship with his boss.

This also applies to Peter Wang, General Manager Sales for Röchling Automotive in Asia. “The members of the management team started out as my teachers and now they are my friends,” says Wang. As the head of sales, Wang travels a lot, is in tune with the market, meets with representatives for customers, organizations, and government authorities and aims to always stay up to date with the latest developments. “All of this helps us develop and optimize our strategy and aids collaboration with our partners and customers. At a time when everything is changing at such a rapid pace, this is crucial.”

In Wang’s opinion, the only way Röchling will be able to come out on top in the competition for qualified and motivated workers is if it gives its employees a sense of belonging and professional satisfaction. “Chinese companies, especially state-owned ones, are inherently better at this as they are far more familiar to applicants,” explains Wang. The fact that employees at foreign companies usually earn much more money is of secondary importance. What really counts is something else: you have to offer Chinese employees career prospects. “Careers are important to us and we are prepared to keep learning in order to achieve this. Learning is in our DNA,” says the 40-year-



**Mengzi (or Mencius) Master Meng
(circa 370–290 BC)**

was Confucius' most eminent successor. His focus was the pursuit of a moral way of living, with respect for others and aspiration for lifelong learning. In his theories, Confucius extolled the achievement of harmony, center, and equilibrium and the value of education, justice, morality, and trust. Mengzi reformed the philosophy of Confucius and developed it further. He ensured that Confucianism became the Chinese state philosophy under the Han dynasty. Like Confucius, Mengzi also traveled around the vast Chinese empire for 40 years, offering his advice to its rulers.

old, who has already worked for several German companies. Wang has been at Röchling for 12 years now and has climbed well up the career ladder in this time.

Trust Promotes Trust

Encouraging real innovation among his employees, so as to ensure that Röchling Automotive's products and services are particularly sustainable – he considers this one of his main jobs. Wang is convinced that trust is essential, especially where innovation is in demand. This is because where there is trust, people feel more secure, which in turn has a positive impact on their work and the company environment, which in turn creates more trust. This initiates a cycle – trust fosters trust. This kind of environment is important to him personally and is something that he has felt at Röchling Automotive from the very beginning: "It's an atmosphere that releases positive energy and gives employees the sense of being a family." The bosses are a part of this family too. "The market changes so quickly. A lack of trust, for example between me and my boss, would take up lots of time and energy and that's something we really cannot afford," says Wang. Important business developments and product decisions are an area where he has to be particularly sure that Röchling really has his back.

Responsible for sales, Wang – who like his management colleague Huang also lives in Suzhou – always has his customers in mind. For Röchling Automotive, the customer is king. It is customer satisfaction that determines the company's success. "Customers will do business with us only if they trust us. The only way we can gain their trust is by coming across professionally and convincing them that we are experts who can help bring innovative products onto the market and make profits," says Wang. You have to listen very closely to understand the customer's values and desires. You cannot squander trust that you have gained, for example by exaggerating or making promises that you cannot keep. "We have to get customers on board and work on the best solutions together."

Give and take is key in negotiations, which at the end of the day are about making gains and profits. "But this is far more than a negotiating strategy. It's an attitude and a form of wisdom," expresses Wang. When it comes to competition, both Wang and Huang are equally convinced that the winning team is always the one that fosters trusting relationships, both internally and externally.



It is not a one-way street, but a relationship based on reciprocity. Trust shown at the plant in Kunshan creates an atmosphere that releases positive energy and gives employees the sense of being part of a big family.





In the Heat of the Fire – Keep a Cool Head

When Dr. Peter Walsh, volunteer firefighter for the volunteer fire service in Landstuhl, Germany, is deployed, he knows from experience that he can rely fully on his colleagues.

Fire, road accident, or rescuing an animal – anyone who dials 112 in Germany can rest assured that help will be on its way in no time at all. Anyone may need to rely on the fire service in an emergency at some point – and in the vast majority of cases, this is manned by volunteers with real-life jobs such as bakers, salespeople, lawyers, car mechanics, and teachers. Or, as in Peter Walsh’s case, a civil engineer with a PhD, who is in charge of real estate management at the Röchling Group in Mannheim.

When an emergency call is made in Germany, this goes to the nearest 24-hour control center, which then springs into action and categorizes the alert according to its level of urgency – a fire is handled differently to a cat stuck up a tree. The volunteer firefighters are then notified via radio – no matter whether they are at work, doing their shopping at the supermarket, out jogging, or tucked up in bed at night. They receive additional text messages via a digital message receiver, which provide more detailed information about the emergency. Each volunteer helper who has been alerted will then decide whether they can participate in the operation or not. Ultimately, the only thing that is important is that enough firefighters actually attend.

“I haven’t experienced a real staff shortage as yet,” says Peter Walsh, who has been a firefighter for over 25 years. However, if this does end up happening, another alert will be sent out and other firefighters will be deployed. Walsh is a member of the volunteer fire service in Landstuhl, which comprises over 70 firefighters in total. They are trained in fire fighting, technical assistance, and environmental protection.

The fire service unit is arranged into two platoons – just one platoon is on stand-by overnight, and both during the day. After being alerted, the firefighters travel to the station, put on their protective equipment, jump in their vehicles, and move out.

Every Action Must Be Spot-On

Walsh, whose father comes from the borough of Brooklyn in New York City and was himself born in Kaiserslautern, Germany, found out about the volunteer fire service through friends when he was 16 and decided to join. “It wasn’t a childhood dream, but the fire service has become a real passion over the years,” the 43-year-old explains. He has been a youth group leader and district trainer, and also completed his alternative national service with the fire service. Today, he is an emergency incident manager. This means that when he moves out with his team and he is the highest-ranking firefighter on site, Walsh is the one who decides what to do.

Operations are extremely structured – every action must be spot-on and everyone needs to know what to do. Procedures for incident commanders are also clearly regulated. Firstly: identify the situation – this includes





“It wasn’t a childhood dream, but the fire service has become a real passion over the years.”

a 360-degree survey. Secondly: plan the course of action, including an assessment of potential hazards and tactical counter-measures. Thirdly: decide and command. “This really simple formula allows us to manage even complex and difficult situations. And I also think it helps people to keep a cool head in situations outside the fire service,” says Walsh.

And he believes keeping a cool head like this is particularly important during an operation, because if a person is stressed, they will only be able to recall a fraction of what they have actually learned. Being scared is not helpful either. He explains that firefighters are trained on how to deal with a potential onset of panic professionally. By his own admission, Walsh does not himself feel scared when he moves out on operations, but he is respectful of the situation. Careful consideration, speed, reliability, and team spirit are other key criteria in ensuring successful operations, and they always head out in groups of at least two. “You need to be able to rely on your colleagues without fail and at all times. Everyone has their own strengths and weaknesses, of course, their own expertise and sometimes gaps in their knowledge too. But when it comes down to it, the one thing that matters is trust.”

For Walsh, trust and reliability are central values, even outside the fire service. During an emergency response, the team needs to trust their incident commander, but the incident commander also needs to trust their team – especially when there is a fire. Technical equipment also needs to be safe and reliable. People’s lives may depend on it – his own and that of others. Walsh explains that technology has improved greatly over the last ten to 15 years.

Drills and Training Courses

In addition to real-life operations, firefighters also attend numerous drills, training sessions, and courses, both locally and at district and state level. For example, they receive training locally to qualify as breathing apparatus wearers, machine operators, and radio operators. Specialist and leadership courses are held at the Rhineland-Palatinate state fire service academy in Koblenz, leading to qualifications such as group, platoon or unit leader. Walsh has attended various leadership courses. However, this is not something people simply do on the side – it is very time-consuming. When you add in family, work, and hobbies, it can be hard sometimes to fit the fire service in too.



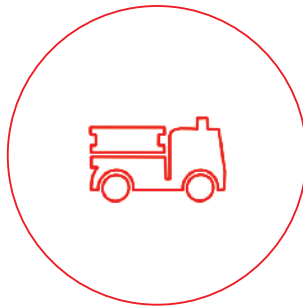
Ziegler



Excellent training in fire fighting, technical assistance, and environmental protection combined with state-of-the-art technical equipment – Peter Walsh feels confident when out on operations. He does not feel scared when he moves out, but he is respectful of the situation.

“It’s a case of finding the right balance,” explains Walsh, who is married with three children and likes going jogging, snowboarding, and playing soccer in his free time. For him, one thing is clear: “The fire service is more than just a hobby. It’s part of your life.” Anyone who has chosen to join the fire service must understand that their radio could send out an alert on any given night or while at work during the day.

The fire service regularly comes out on top in surveys on the reputation of professions. Walsh believes that, as a firefighter and volunteer civil servant, you have to treat this responsibility with a sense of care and duty. “People rely on us to help them in a professional capacity, and most of them don’t even know that the majority of us are volunteers. They trust our organization. And I’m proud of that.”



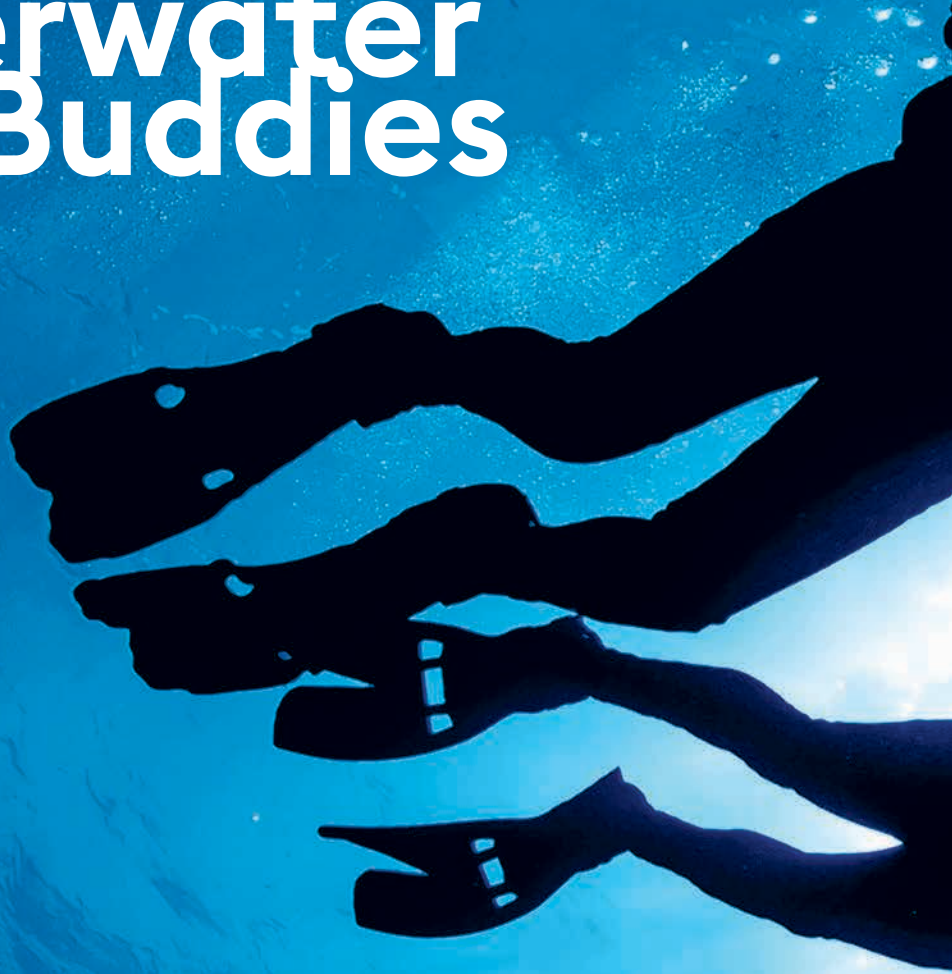
Volunteer Fire Services in Germany

Around 95 percent of firefighters in Germany are volunteers. They are not remunerated for their public service, but municipalities can pay an expense allowance at their own discretion. The remaining five percent are professional firefighters, factory firefighters, or full-time staff. Almost every place in Germany has a dedicated fire service – with one active firefighter for around every 80 inhabitants. The time between an emergency call being made and first responders arriving on scene varies between different states – a maximum of ten minutes is usually stipulated for major cities. “It really is a world-class service,” says firefighter Peter Walsh. State fire service laws dictate that employers must release their staff for fire service operations. They can obtain reimbursement for time lost from the municipal authorities.



Peter Walsh and his colleague Aron Geisel (right) know exactly what to do during an operation. And they also know that they can rely on each other.

Underwater Buddies





Gliding weightlessly through turquoise-blue water, gently moving your flippers up and down, gazing at exotic fish and coral, savoring the peace and quiet and colorful submarine world: diving is a fascinating sport – and an adventure. Anyone who dives to 35 meters or below must follow a series of painstaking safety rules and keep a cool head, otherwise they risk putting their life at danger in the worst case scenario.

“Above all else, diving is dangerous when people struggle to gage their own abilities, or when they overestimate themselves,” says Lisa Marie Hausteiner, a customer accounting employee at Röchling Industrial Oepping in Austria. She obtained her diving license in 2011 when she was about to head on a trip to Australia for several weeks and desperately wanted to see the Great Barrier Reef. She was a water baby as a child, so taking her diving license was no great sweat to her. Quite the opposite in fact. Although many people in her homeland of Austria head up into the mountains, and Hausteiner herself counts hiking among her hobbies, the underwater world was always a place of longing for her.

From Austrian Lakes to the Red Sea

Hausteiner is a business graduate who studied in Linz, Austria, before joining the international accounting firm KPMG. She loves nature – underwater and on dry land – which is why, after a few years’ traveling, she returned to the countryside in her home district of Rohrbach. She learned to dive in Austria’s lakes. It is a very good terrain for training, but Hausteiner’s favorite place to dive is the Red Sea, which has such a wide diversity of species on offer. “And it’s all much more enjoyable in warm water, of course, because you don’t get cold as quickly.”

A dive always lasts between 45 and 60 minutes. More than three dives in succession is not advisable, and definitely no more than four, since the high pressure underwater is very demanding on the body. Hausteiner explains that you also have to cope with high waves out at sea, and there are often gusty winds. You then have quite a distance to cover to get back to the boat after diving, and that in itself can wear you out. Hausteiner is a sports enthusiast and keeps physically fit primarily by horse riding. She has her own horse and goes riding at least five times a week. Safety is her main priority when she is in the saddle. In addition to a helmet, she also wears a back protector when out riding that protects her spine in the event of a fall.

The 31-year-old never cuts corners in terms of safety when she goes diving either. The number one rule is to always go diving with others. Hausteiner usually goes diving in groups of around ten, which are then split up into pairs. Each person has a buddy to whom they pay special attention. This starts even before the dive, when they carry



“I need to be able to understand my buddy innately. If there’s an emergency, you can’t discuss things anymore, and so everything has to be done correctly and automatically.”

out special checks with their partner. Their technical equipment and devices must be 100 percent in order. “Although regular servicing is carried out, especially on the diving regulators, it’s always better to perform checks,” says Hausteiner. She explains that it is also vital that divers stick to the rules that they agreed to before the dive at all times, such as the diving depth, length of the dive, and route.

Correct Breathing Technique, Good Body Sense, Inner Calm

Once they get going, good divers get to experience what makes their sport so wonderful, but also what is so difficult to attain: weightlessness. Your body floats through the water as if in outer space, neither sinking downwards nor rising to the surface. “For this you need the correct breathing technique, a good sense of one’s own body and inner calm,” says Hausteiner. She counts wreck diving among the most spectacular dives she has been on. She went on a dive just recently to the British cargo ship *Thistlegorm* that was bombed during World War Two, where she got to observe machinery, old trucks, and locomotives. Hausteiner describes how diving through canyons and caves is also extremely beautiful when the light is shining through. And any dive where she catches sight of a shark is a good one: “Any fear you have of these creatures disappears immediately when you’re diving. Sharks are shy creatures and really fascinating.”

Hausteiner regards herself as a cautious person. She only takes risks, if at all, once she has weighed them up properly. “Anyone who is well trained or has sound basic knowledge can definitely take the odd risk here and there. But that isn’t the case for me when diving – I don’t risk anything at all here.” If Hausteiner gets a bad feeling before a dive, she will not go – in these cases, she always trusts her gut feeling. For example, she has utmost respect for strong, unusual currents. You often cannot even see these on the surface, but then you get in the water and cannot swim against them.

Trust is just as important as safety – trust in oneself, but also in your dive buddy, who will be the only person down in the depths who can help you in an emergency. This is why Hausteiner would never go diving with a stranger. “I need to be able to understand my buddy innately. If there’s an emergency, you can’t discuss things anymore, and so everything has to be done correctly and automatically,” explains Hausteiner. She has herself experienced what it feels like when things do not go right. Two years ago, she had a near-miss during a 35-meter dive when she was suddenly overcome by the feeling that she was not getting enough air through her breathing tube. “It happened in a place where there was a strong current, it was dark and cold, and I felt like there was no way out of the situation,” explains Hausteiner.

Ascending Rapidly Is Dangerous

At that moment, she did not manage to keep a cool head, which is so important in situations like this. Her breathing became shallow, and then she stopped getting any air at all, and she was overcome by the instinct to get back up to the surface as quickly as possible. But that is not a good idea. Ascending rapidly can cause lung overpressure and push air into the bloodstream, which can lead to paralysis and even death. Or bubbles of dissolved nitrogen can form in the blood vessels, leading to gas embolisms and inadequate blood circulation. Hausteiner was lucky: “My father was my buddy and my salvation. He calmed me down and slowly returned to the surface with me.” She felt very anxious on her next dive, but she managed to overcome this feeling: “Otherwise, I would have had to hang my diving suit up for good.”

Hausteiner says that she has learned a lot about herself from diving. She is better able to calm down and rely on what she has learned. She also benefits from this in other areas of her life. For example, she has a highly responsible job in accounting, where she always has to



Wearing her wetsuit, diving goggles, and oxygen cylinder, Lisa Marie Hausteiner takes a courageous leap from the boat into the sea as she heads out on her next dive – her buddy is already there waiting for her.

weigh up the cases where work needs to be checked and the cases where she must place her trust in the work of her colleagues, and in her own work. Cross-checks are unavoidable in the world of numbers. “Mistakes can happen at any time, and so these checks are really important. But it’s also important that we have mutual trust within our team.”

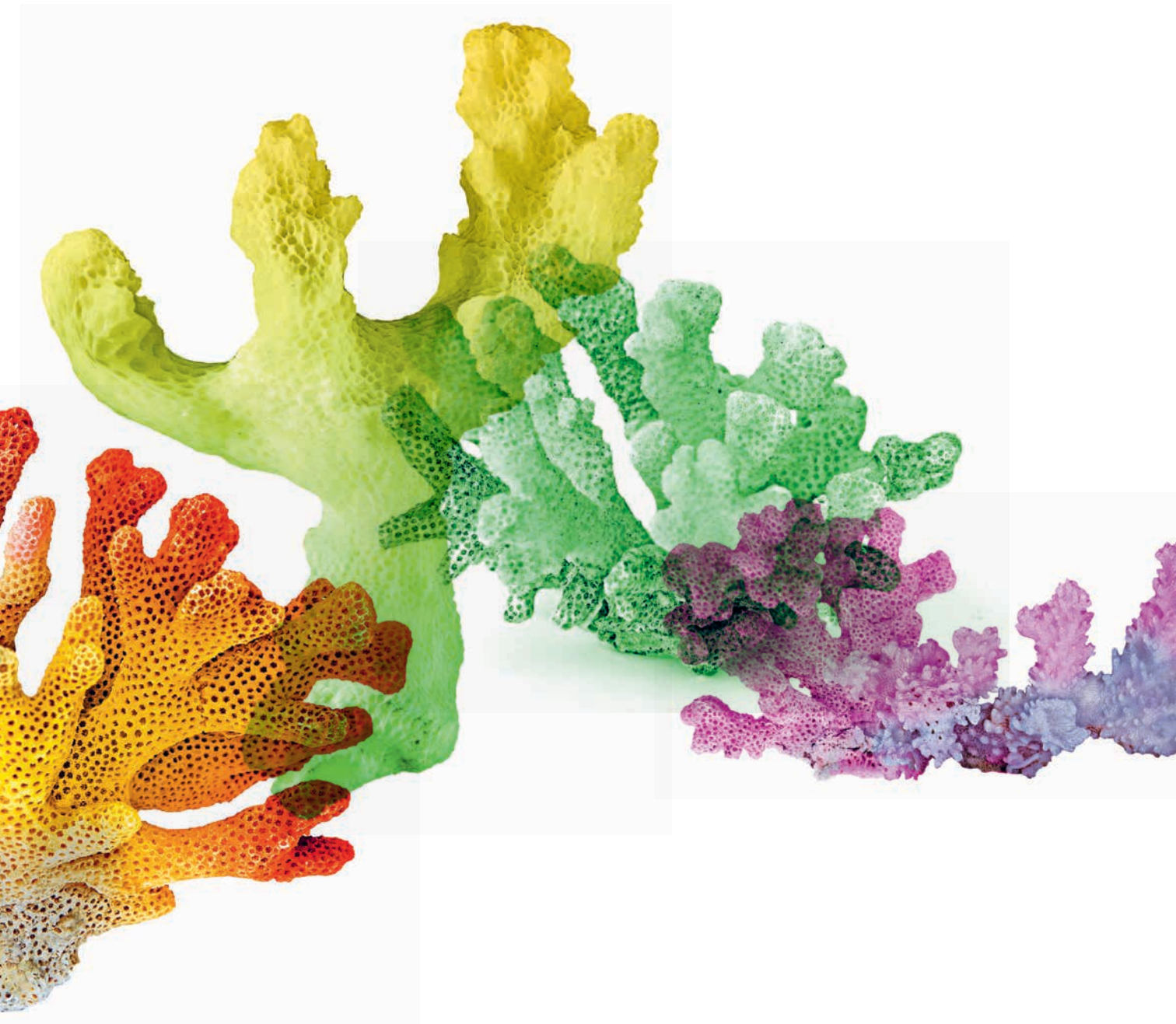


From Coral Harvesting to Recreational Diving

Diving dates back to around 4500 BC, when it was used to harvest sea sponges, pearls, and coral. In ancient times, divers are believed to have been used in battles against enemy ships. The first more light-weight diving apparatus was developed in the first half of the 20th century, and diving became a recreational sport during the 1950s. Prior to this, scientists and inventors like Hans Hass from Austria and Jacques-Yves Cousteau from France had developed the first practical diving equipment. This is when recreational diving started to move away from free-diving, where the diver holds their breath for the entire dive, and towards scuba diving.

Source: Wikipedia





Partnerships, Not Projects

The Röchling Foundation is based
on long-term collaborations



This plastic cage, situated on the premises of a hospital in Sultanpur in the Indian state of West Bengal, is to be used to collect plastic waste. Since there is no regulated waste management system in rural areas, the non-profit organization SOCEO has developed a model intended to combat the pollution caused by plastic waste, with the participation of local NGOs, waste pickers, and local government. The project is funded by the Röchling Foundation.

We have all seen it before: projects come and go, but the problems persist. Nevertheless, we all think and act in terms of projects. We race from one project to the next. We need digital assistants to be able to keep an overview of all these projects. And the names we come up with for these projects become ever more bizarre. But do we control our own projects, or do they control us? And, let's be honest now, are we actually making any improvements with our umpteenth project? The Röchling Foundation is moving in a different direction.

“Project-itis” has spread like wildfire in the world of non-profit work. Civil society organizations usually receive funds on a yearly basis. Anyone who works for a non-profit organization is often unable to say for certain in October whether their workplace will still be around in January. However, there is another, much more serious problem: global challenges are becoming increasingly complex and unfolding at a rapid rate. And how is the world responding to that? You've got it – with projects. It's like looking at climate change as something we can take care of just like that, with six months' focused work centered around a flipchart.

But we need something quite different to manage social and ecological change: namely, reliable partnerships. Therefore, the Röchling Foundation has largely moved away from funding short-winded projects and now sees itself as a long-term supporter of its cooperation partners from civil society and the scientific community. “We want to develop themes, not projects,” says Chair of the Foundation's Board of Trustees, Annunziata Gräfin Hoensbroech, summarizing the approach they embarked upon around two years ago. She explains that their objective is to strengthen the organizations they support on a long-term basis.

This requires staying power first of all, and secondly, an understanding of collaboration that generates more than just money. “We're sticking with it – with partnerships that are longer than the norm for the most part, and with contacts, networks, and qualified advice,” says Gräfin Hoensbroech. This builds mutual trust, which is of great benefit to the cause.

Empowering People to Earn a Living

Sarah Gekeler and Sujoy Chatterjee pop into the Röchling Foundation's offices in Mannheim now and again. They run the non-profit organization SOCEO. Their small team empowers socially disadvantaged people all around the world to start a business and earn a living. In the Indian state of West Bengal, SOCEO is currently working with municipal authorities, civil society organizations, and waste pickers living in precarious conditions to develop a reliable waste management system. Their aim is to liberate the sensitive mangrove ecosystem in the Ganges Delta from huge volumes of plastic waste and to empower the waste pickers to earn a secure living.



Sarah Gekeler and Sujoy Chatterjee run the non-profit organization SOCEO.

soceo

The Röchling Foundation is supporting the project – for a period of at least five years. The process began with a study looking initially at the local population’s awareness of the issue of plastic waste. SOCEO then developed simple recycling chains in cooperation with all stakeholder groups involved on the ground. Collecting stations were set up and strong business relationships were forged between waste pickers, municipal authorities, and civil society organizations.

From 2020 to 2022, their main task will be to roll out the concept nationwide and to train influencers to achieve this. “We are pleased to have a reliable partner in the Röchling Foundation, and one that wants to go the distance with us,” says Sarah Gekeler.

Investing in Sustainable Infrastructure

The Röchling Foundation also observes a principle of investing in sustainable infrastructure rather than more and more new projects when it comes to science funding. Researchers at the Fraunhofer Institute for Structural Durability and System Reliability (LBF) in Darmstadt, Germany, are investigating ways to respond to an intriguing question: how can we enhance the materials in recycled

plastic waste so that they are not simply used to manufacture more non-durable consumer goods, but long-lasting and technologically advanced components? Upcycling instead of recycling is their ambitious objective. The Fraunhofer Institute and Röchling Foundation are heading in a new direction in order to achieve this.

Working Together and Sticking at It

With financial support from the Röchling Foundation, a platform has been established which scientists, manufacturers, and industrial users can use to identify shared research needs and develop and implement corresponding projects in consortia. “We are creating an ecosystem, so to speak, where research projects can be developed and grow that are geared towards practical needs,” explains Fraunhofer Project Manager Dr. Frank Schönberger. This cooperation will also run for at least five years.

Sticking at it, working together instead of simply providing funding, developing partnerships instead of projects: the Röchling Foundation believes this is the only way to meet complex challenges effectively.





Waste pickers on Sagar Island in West Bengal, 100 kilometers south of Kolkata, make an important contribution to channeling plastic waste into regulated recycling processes by collecting and sorting the waste and selling it to recycling companies. Their work helps to ensure that plastic waste does not pollute the local ecosystem in the mangrove forests and that it is not carried along the many rivers in the Ganges Delta and out to sea.

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