Issue 02|2015

be top

MAGAZINE OF THE FRIEDHELM LOH GROUP

EXPERTISE House of Mechatronics: Interdisciplinary engineering
EXPERIENCE Steel: Investing in technologies of the future
COMMITMENT Pilot project: Career training for refugees

FOCUS ON BIG DATA

Data Mining

LEVERAGING POTENTIAL

Dear Readers,

Do you know how much data is contained in one gigabyte? Do you have any idea how large an exabyte, zettabyte or yottabyte is? These are the data quantities of the future. In 2020, 40 yottabytes of data will be created, processed and saved – that is 40 million times one billion gigabytes. It seems to be getting more and more complex and expensive to sensibly manage and utilise these enormous amounts of data.

We need new, intelligent concepts. Norway has achieved sensational success in this area. A decommissioned mine is being transformed into one of the largest data centres in the world. Several hundred RiMatrix containers fit on a surface approximately the size of seventeen football fields. Five storeys are located not just underground, but under a large fjord. Of the many advantages, the main ones are ecological: the total energy is derived from wind and water. Cooling is achieved by means of the fjord's seawater. And because the existing tunnels are being recycled and do not need to be rebuilt, the operating entity is spending 40 per cent less than the cost of a new construction. These savings have a significant impact on the cost estimation for a data centre location.

To facilitate leaps in efficiency for our customers is one of our company objectives. Philip Morris was able to make such a leap: Blue e+, the new generation of cooling units, underwent an initial performance test in Berlin. The results were compelling: Philip Morris requires over 80 per cent less energy to cool its enclosures.

In Europe these days it is not just about numbers, even though the number of refugees is much too high. It is about each individual – and providing the aid necessary to make a good life. We hope that our pilot project giving young people career qualifications will motivate others to follow our lead. We want to take part in shaping integration as quickly as possible. Join us!

I hope you enjoy the magazine and find inspiration in its pages!

Sincerely,

Friedhelm Loh

FRIEDHELM LOH
Owner and CEO of the Friedhelm Loh Group

COVER STORIES

EXPERTISE

EXPERIENCE

THE F.L.G. COSMOS

COMMITMENT

STANDARDS

YOUR OPINION MATTERS!

Do you have questions, suggestions, praise or criticism about the current issue? Simply mail the editorial team at: betop@friedhelm-loh-group.com.

be top as an App!
Regular updates on the topics in this issue.

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2017

will see the opening of the **European XFEL** in the Hamburg metropolitan area. This will be a superlative research facility in which, in one 3.4-kilometre-long tunnel, researchers will be able to gain new insights into nanostructures, molecules and viruses with the use of ultrashort X-ray flashes. The European XFEL is relying on engineering solutions from Eplan for its electrotechnical equipment. The **Eplan Electric P8** and **EEC One** software tools, as well as the additional module **Eplan FieldSys**, are simplifying work for the electrical planners of the research campus. The German Electron Synchrotron (DESY) is a member of the Helmholtz Association and the chief partner in this project. It has housed the necessary electronics in over **450 Rittal TS 8 enclosures** that are kept at a constant temperature through the **Liquid Cooling Packages** cooling solution. Pictured: The laser prototype and researchers during the changing of the cathode box containing the photocathodes used to generate the electrons to be accelerated.

➔ LINK TIP:
www.xfel.eu

900

megawatts (MW) of output will be produced by the **pumped-storage power plant** currently being built by **Nant de Drance SA** in the canton of Valais in the area between Martigny (CH) and Chamonix (F). A total of six pump turbines, each with a capacity of 150 MW, can switch within ten minutes between the full-load pump operation and the full-load turbine operation. Such high flexibility permits a rapid response in the event of peak electricity demand and an equally rapid switch to electricity storage. Some 2.5 billion kilowatt-hours of electricity will thus be generated at peak load times, supplying around 625,000 households a year. The required energy will be stored during off-peak periods, for example at night or in cases of overcapacity from renewable sources. **Rittal** is supplying **24 TS 8 combinations** for this major project to the General Electric (GE) technology group.

➔ LINK TIP:
www.nant-de-drance.ch

20

kilometres per hour is the average speed on the streets of Wuhan, the capital of Hubei province in China. Because at this speed the trip to the registry office can take several hours, the metro is very popular, even for wedding couples. Three of the eleven planned subway lines are currently in operation, reliably carrying the roughly ten million inhabitants of this Central Chinese metropolis through the city along routes totalling more than 95 kilometres. The **Wuhan Metro's** new Line 3 is relying on **Rittal** solutions, just as its predecessors Lines 1 and 2 do – the company installed numerous **compact enclosures and enclosure systems** in all 23 stations of the new subway line. At the end of the year, the Wuhan Metro will be the very first subway line to cross China's longest river, the Yangtze.

➔ LINK TIP:
http://tinyurl.com/Wuhan-Metro

FASTER – BETTER – EVERYWHERE.

Global Player. The Friedhelm Loh Group is present around the world with more than 78 subsidiaries. Ideas from Germany are in demand on every continent. A selection of six reports.

Germany

CONTOURED BLANKS

Metalsa, one of the biggest German suppliers to the automotive industry, transferred a grand total of four tools for manufacturing contoured blanks to Stahlo. Using these tools, Metalsa produces contoured blanks specific to cabriolets for automobile manufacturer BMW. The first tool is already in use at Stahlo in Gera, Germany, and another three will be following shortly. Because the steel being processed is of high strength and high gauge, its processing is extremely challenging. The current order volume for the single tool totals about 1,450 tonnes of steel annually. Including the three additional tools, the volume will be about 5,100 tonnes.

Colombia

EXTREMELY ROBUST

One of the world's leading companies in the building materials sector has chosen to go with Rittal's expertise. At its new production plant in Colombia, the large concrete manufacturer is using a Ri4Power low-voltage switchgear system consisting of 44 bayed TS 8 enclosures with slide-in assembly technology. Even against the backdrop of extreme climatic conditions locally, the Rittal solution won the company over: temperatures between 20 and 35 degrees Celsius and a humidity of 82 per cent pose no problem for the installation.

Switzerland

HIGHEST QUALITY

Bürki Electric, a Swiss engineering company for control and plant systems, trusts in Kiesling's expertise. The company has been manufacturing with the Perforex BC 1007 HS machining centre since September 2014. Now all machining operations, from boring to deburring, take place fully automatically. "We know that we receive the highest quality from Kiesling as well as excellent local customer service," says Production Director Sandro Knöri at Bürki Electric, describing their decision to work with Kiesling. "With the Perforex, we're more productive and more professional, which gives us a clear competitive advantage."

Italy

TURNKEY IT

Nestlé is relying on turnkey Rittal solutions in the new server room for its Italian branch in Milan. The company, the world market leader in the areas of nutrition, health and wellness, ordered 33 TS IT racks as well as ten cooling systems, two chillers and the matching RiZone software to monitor processes in the data centre. Nestlé, the world's largest food manufacturer, now has especially efficient and energy-saving IT infrastructure that is state of the art.

Poland

SKILLED PARTNER

Gedia Automotive Group, a leading automotive industry supplier headquartered in Attendorn in North Rhine-Westphalia, Germany, develops pressed car body parts and welded assemblies for lorries at several company sites. For a project with Opel in Poland, Gedia decided for Stahlo as a cooperation partner. Starting in 2016, Stahlo will be delivering 1,100 tonnes of steel to the company annually. Gedia especially values Stahlo's great expertise in the area of contoured steel, but was also convinced to choose Stahlo as a partner because Stahlo enjoys such an excellent reputation on the market.

China

WELL COOLED

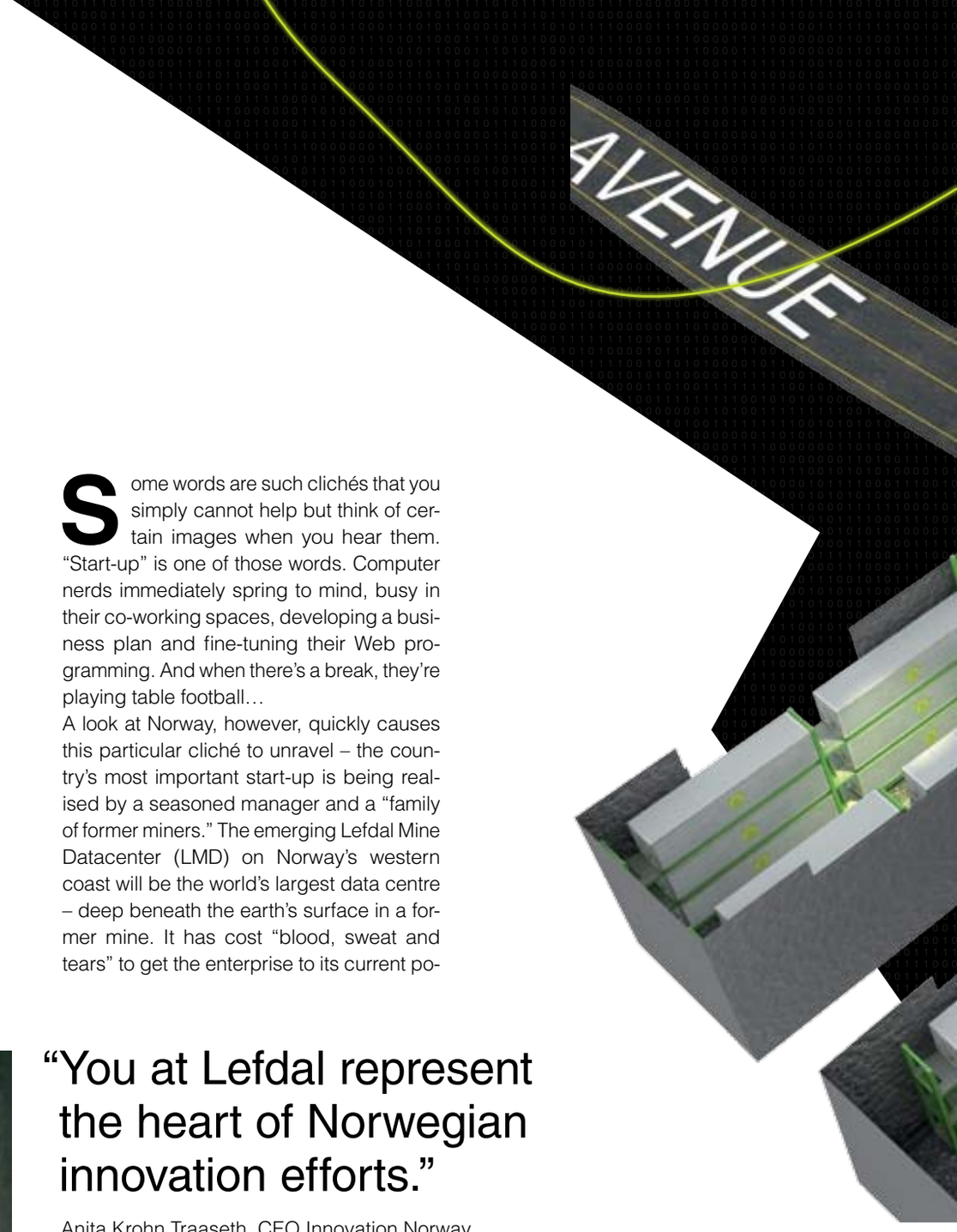
Despite the fact that Japanese companies usually rely on domestic vendors, LG Mazak, one of the top three machine tool manufacturers globally, decided for an efficient and economical cooling solution from Rittal for a project in China. The Japanese company relies on Rittal Blue e cooling units to chill its enclosures. What played a special role in the decision was the extreme climatic conditions in which the units will be operating. Rittal cooling units are extremely robust and dependable even in high ambient temperatures and high humidity.

NORWEGIAN (COOLING) SOLUTIONS
The ingenious and CO_2-neutral climate control concept at the Lefdal Mine Datacenter (LMD) – the world's most state-of-the-art data centre – is based on cold seawater as the refrigerant and the fjord as heat exchanger. The fjord is 565 metres deep and connected to four glaciers.

THE BIG CO_2OL

Data centres of the future. The industrialisation of data centres requires ingenuity and a pioneering spirit. Norway is setting a new course in this field with natural cooling – supported by Rittal, the global specialist in modular data centre solutions.

Text: Joscha Duhme and Klaus Rathje



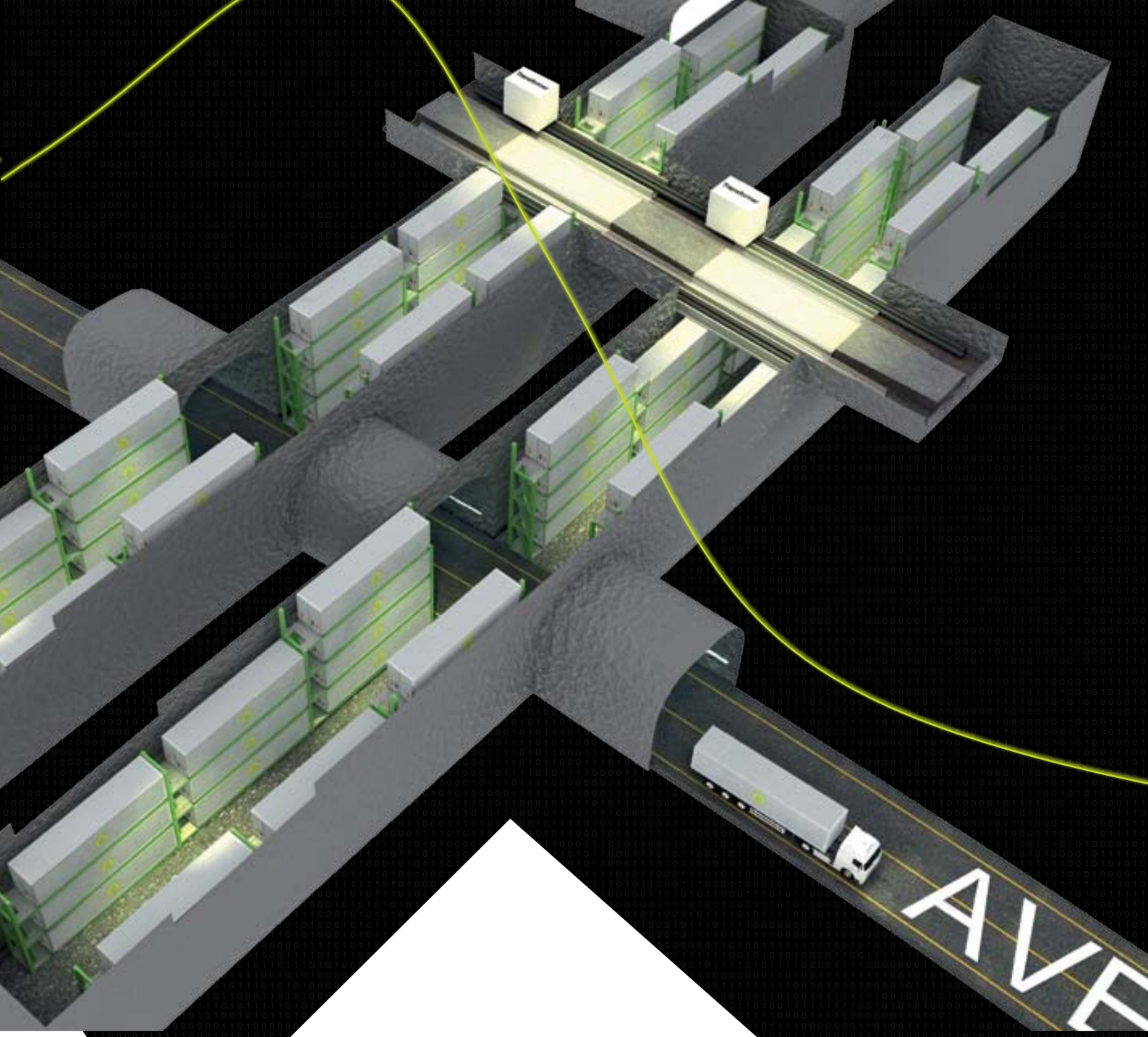
Some words are such clichés that you simply cannot help but think of certain images when you hear them. "Start-up" is one of those words. Computer nerds immediately spring to mind, busy in their co-working spaces, developing a business plan and fine-tuning their Web programming. And when there's a break, they're playing table football…

A look at Norway, however, quickly causes this particular cliché to unravel – the country's most important start-up is being realised by a seasoned manager and a "family of former miners." The emerging Lefdal Mine Datacenter (LMD) on Norway's western coast will be the world's largest data centre – deep beneath the earth's surface in a former mine. It has cost "blood, sweat and tears" to get the enterprise to its current position, says Anita Krohn Traaseth, CEO of the country's innovation agency Innovation Norway (in Norwegian: Innovasjon Norge). "People have tried to hold us back," she said to the initiators at the first official press conference in Oslo in August 2015. She was clearly proud to be a part of the group of people who helped make this innovative endeavour a reality, who have laid what could become the cornerstone for a new Norwegian export industry. "You at Lefdal represent the heart of Norwegian innovation efforts."

"You at Lefdal represent the heart of Norwegian innovation efforts."

Anita Krohn Traaseth, CEO Innovation Norway

In Måløy, a town of 6,000 inhabitants, a bit of a gold-rush atmosphere has already broken out now that increasing numbers of companies in the energy sector and new technology businesses are setting up shop there. LMD has awakened an entrepreneurial spirit. Because a local group of investors holds 50.7 per cent of the company's shares, money will eventually flow back into the region, a region that previously subsisted from the mining industry. Chairman of the Board Egil Skibenes heads the operating company, and he is breathing a sigh of relief that the "end of the beginning" has finally been reached. It took six years to get from the initial idea of using a decommissioned mine to house a data centre to the start of construction. In a tunnel system with 75 chambers stretching across five levels, an area of 120,000 square metres offers space for infrastructure with a potential total



NO UNDERGROUND TRAFFIC CONGESTION
Every level of LMD is accessible by way of a central access road, the "Avenue." Leading from it, the "streets" are the direct connection to the individual chambers. Even here, deep beneath the earth's surface, lorries can drive along two lanes. "We have the best streets in the region," says LMD Marketing Director Mats Andersson.

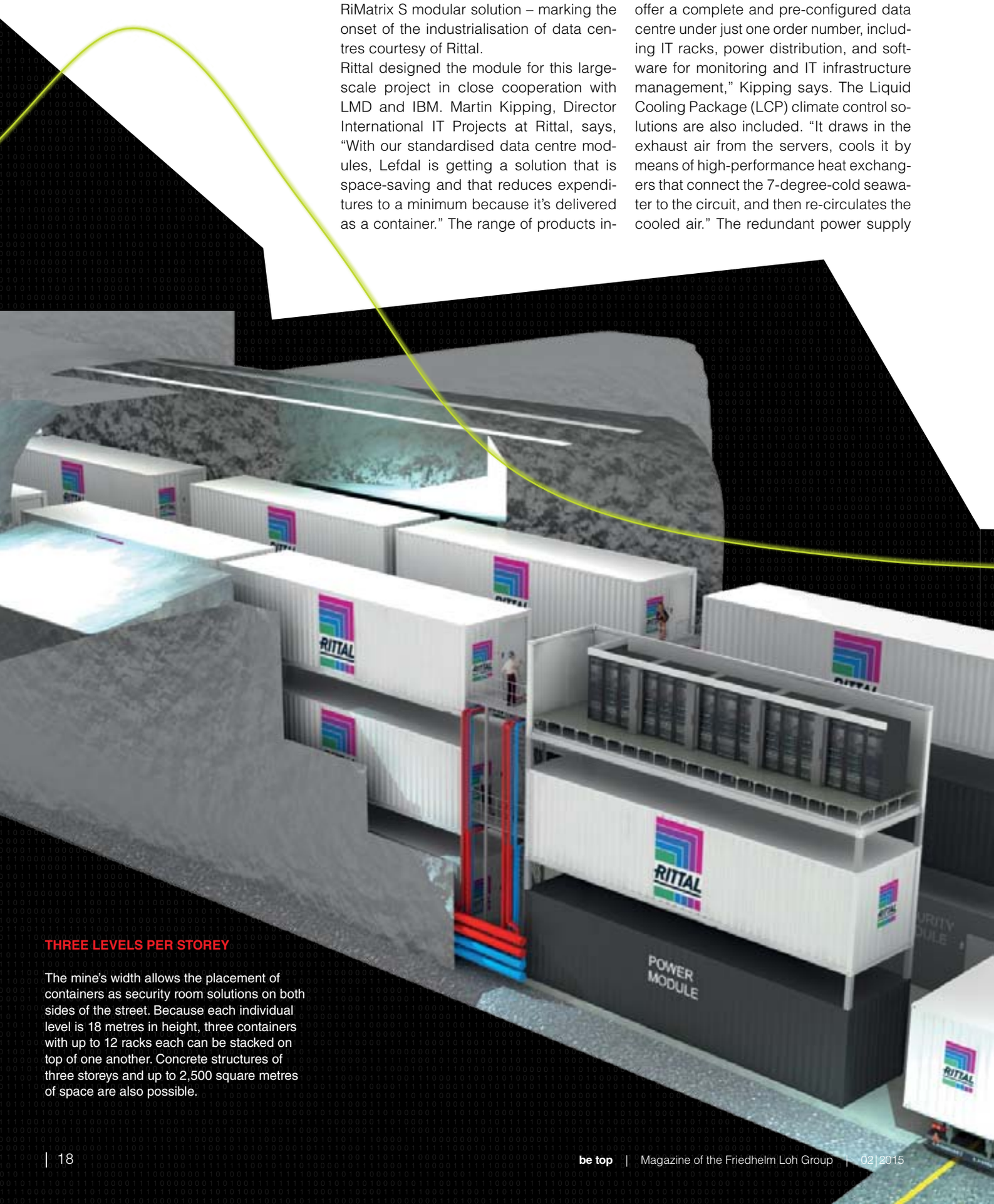
capacity of 200 megawatts. "It's said that 'big is beautiful,'" Skibenes says. "And the Lefdal Mine is very, very big. We're planning one of the world's best data centres." His goal is to make LMD number one in Europe with the best figures for cost-efficiency, security, flexibility and sustainability. "Lefdal will simply outshine everything that's come before it," says Rittal's Executive Vice President Andreas Keiger, responsible for European sales. Rittal has been involved as a strategic technology partner on the project for some time now. IBM put together an initial feasibility analysis, and they and Lefdal approached Rittal to design the installation of server components. "This will be the world's most efficient solution that we could achieve," Keiger explains. "Lefdal is using 100 per cent renewable energy – and we reach a power usage effectiveness value of 1.1." Even the server cooling couldn't be greener, since Lefdal is taking advantage of the water in an adjacent fjord. "The fjord is our refrigerator," says LMD Marketing Director Mats Andersson. "The territory itself provides favourable conditions, and Rittal is ensuring the greatest-possible efficiency inside," Keiger says. When total cost of ownership is taken into account, LMD is 40 per cent more economical than other data centres in Europe.

EXPANDABLE WITH PLUG AND PLAY

In order to gain an edge in flexibility and cost-efficiency, LMD is relying on extensive modular solutions. "Our clients can 'grow' or 'contract' according to their needs," Andersson explains. "We can expand the scale of technology by using →

plug-and-play systems." To this end, LMD is taking advantage of standardised data centre modules for all of its IT infrastructure. And this is where Rittal comes in: scalability at LMD is based on the standardised RiMatrix S modular solution – marking the onset of the industrialisation of data centres courtesy of Rittal.

Rittal designed the module for this large-scale project in close cooperation with LMD and IBM. Martin Kipping, Director International IT Projects at Rittal, says, "With our standardised data centre modules, Lefdal is getting a solution that is space-saving and that reduces expenditures to a minimum because it's delivered as a container." The range of products includes five different modules with ten or twelve server racks and a network rack. Customers can select between five, ten and twenty kilowatts per rack, depending on their performance requirements. "We offer a complete and pre-configured data centre under just one order number, including IT racks, power distribution, and software for monitoring and IT infrastructure management," Kipping says. The Liquid Cooling Package (LCP) climate control solutions are also included. "It draws in the exhaust air from the servers, cools it by means of high-performance heat exchangers that connect the 7-degree-cold seawater to the circuit, and then re-circulates the cooled air." The redundant power supply



THREE LEVELS PER STOREY

The mine's width allows the placement of containers as security room solutions on both sides of the street. Because each individual level is 18 metres in height, three containers with up to 12 racks each can be stacked on top of one another. Concrete structures of three storeys and up to 2,500 square metres of space are also possible.

"Data is becoming the world's newest resource, and I can't think of a better place to store it than Lefdal."

Arne Norheim, Country Manager IBM

and backup power systems in 2n redundancy are also integrated into the standard system. The concept can be utilised nearly everywhere, as Martin Kipping explains: "The solution can be deployed as a separate container, but can also be installed within existing rooms."

OPERATIONAL IN JUST SIX WEEKS

"Clients can therefore decide for the appropriate customised solution and yet still avail themselves of all the benefits that standardisation provides," Keiger says. Customers receive the prefab data centre solution much faster and can count on proven, pre-certified system components. "We need just six weeks from ordering to commissioning," Kipping says, highlighting just one of the benefits. "Planning and construction of a complete data centre can take one to two years," Kipping says – which in comparison to six weeks is not a serious alternative when urgent modernisation or capacity expansion is needed.

With this unparalleled pan-European offering, LMD will be catering to the increasing demands for data centre facilities. "The world around us is changing more rapidly now than ever before," says IBM Country General Manager Arne Norheim. There are four trends decisively influencing the digital world: "Big Data, the Cloud as the new business model, mobile use and social tools. As a result, billions of gigabytes of data are being generated every day." The growth is exponential. "Ninety per cent of all data stored worldwide originated in the past two years," Norheim says. In Keiger's words: "We expect that global data volumes will double about every eighteen months."

DEMAND INCREASING THROUGH 2020

This demand is yet another reason why it is becoming more important for companies to manage and secure their sensitive data, from the time of its creation until it is deleted. "By the year 2020 alone, we see the need for sixty new, large data centres in Europe, which is associated with an annual increase in capital expenditures of 10 to 12 per cent," Egil Skibenes says. It is important that the service be quickly up and running, which is impossible with conventional customised solutions. Thanks to their cost advantages and high degree of flexibility and scalability, standardised data centre solutions such as the RiMatrix S are gaining in importance. According to Keiger, "Cost-efficiency and energy-efficiency drive decisions about the ideal IT site."

This leads us back to Norway's west coast, where construction within LMD is already saving money as compared to a typ- ➔

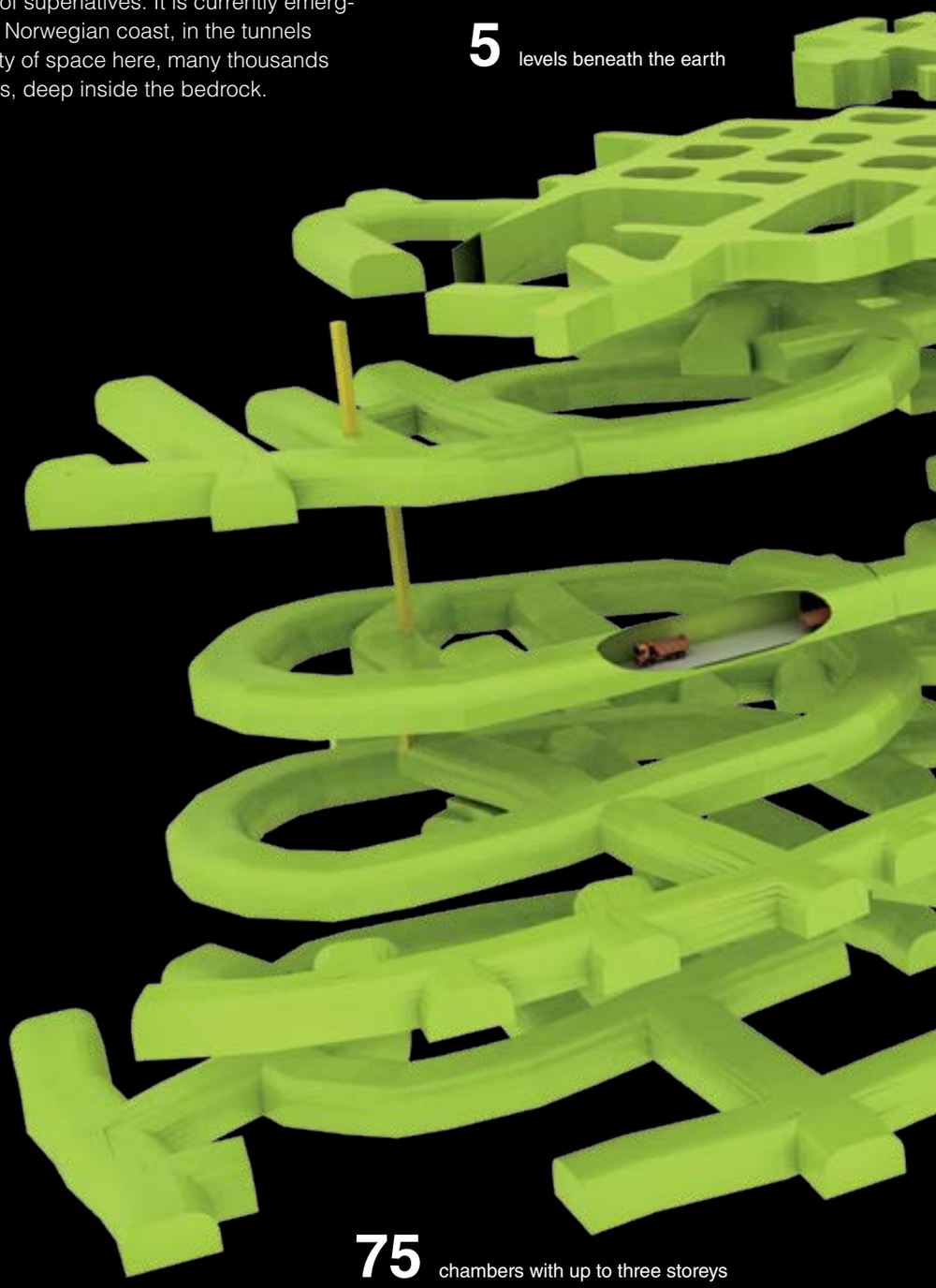
FIVE ARGUMENTS FOR RIMATRIX S

- ➔ **Pre-defined data centre** modules for simple planning/design
- ➔ Short delivery times of up to six weeks and **quick commissioning**
- ➔ **Calculable return on investment (ROI)** owing to the data centre's complete documentation upon handoff
- ➔ **Simplified end-certification** of the ready-to-use data centre with customers
- ➔ **Guaranteed power-usage effectiveness (PUE)** value of up to 1.15

AN UNDERGROUND CITY

The Lefdal Mine Datacenter will be a data centre of superlatives. It is currently emerging and taking shape in a mountain massif on the Norwegian coast, in the tunnels of a decommissioned mineral mine. There is plenty of space here, many thousands of square metres that branch out across five levels, deep inside the bedrock.

5 levels beneath the earth



75 chambers with up to three storeys

100 per cent renewable energy

AS GREEN AS IT GETS

LMD is characterised by renewable energy: 100 per cent of the energy used is generated with the assistance of wind and water. Several hydropower plants near the mine provide a redundant power supply. Total energy production in the area is currently 12.7 terawatt-hours, and over the past ten years the power supply has had a statistical reliability of 99.97 per cent. This performance is commensurate with Tier III requirements.

BRINY COOLING FROM NEARBY

Cooling takes place by way of seawater from an adjacent fjord. The water flows through a closed circuit that cools each storey and each street via water-to-water heat exchangers, which in turn are connected to the air-cooling circuit of each data centre module. The fjord, with a depth of 565 metres, has four glaciers flowing into it and offers an unlimited supply of seawater at 7.5 degrees Celsius. The mine's location beneath sea level reduces energy requirements for the water supply to a minimum.

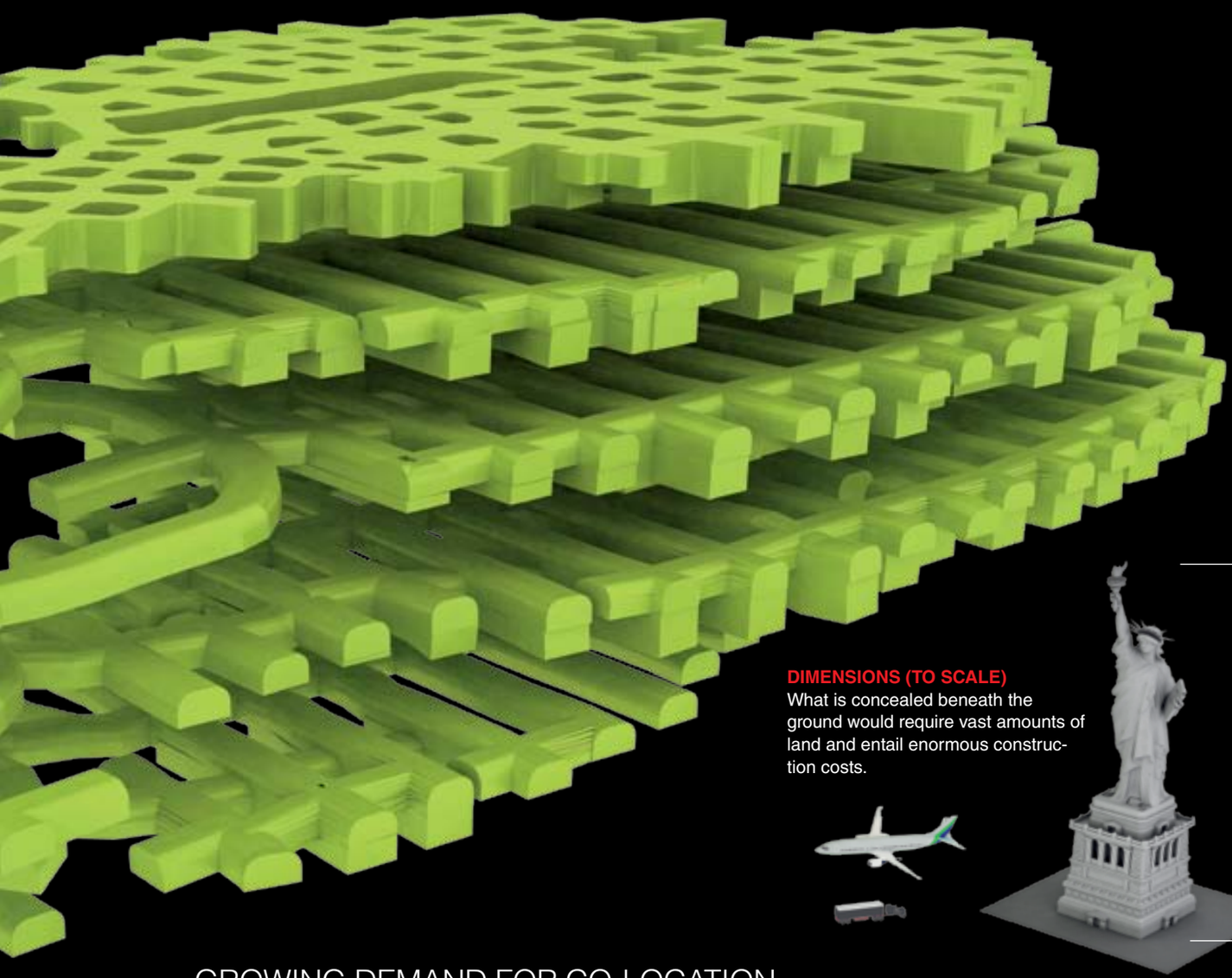
HATCHES BATTENED IN NORWAY

LMD is in compliance with the security and availability guidelines of a Tier III data centre. The facility is accessible through just one single point of entry, which offers maximum security and access control. The rock formation guarantees natural protection against electromagnetic pulses. Specially trained security staff keep watch over the facility and the surrounding area 24 hours a day, every day of the year. A three-step authentication process and smart camera systems serve as additional protection beyond these measures.

CHOICE OF MODULAR SYSTEM

Working together with LMD and IBM, Rittal developed standardised data centre modules based on the RiMatrix S: ready-made, proven, scalable and quickly deliverable. The range of products currently includes five different modules with ten or twelve server racks, as well as a network rack including the Rittal Liquid Cooling Package (LCP) climate control solution and the power supply.

120,000 square metres of surface area



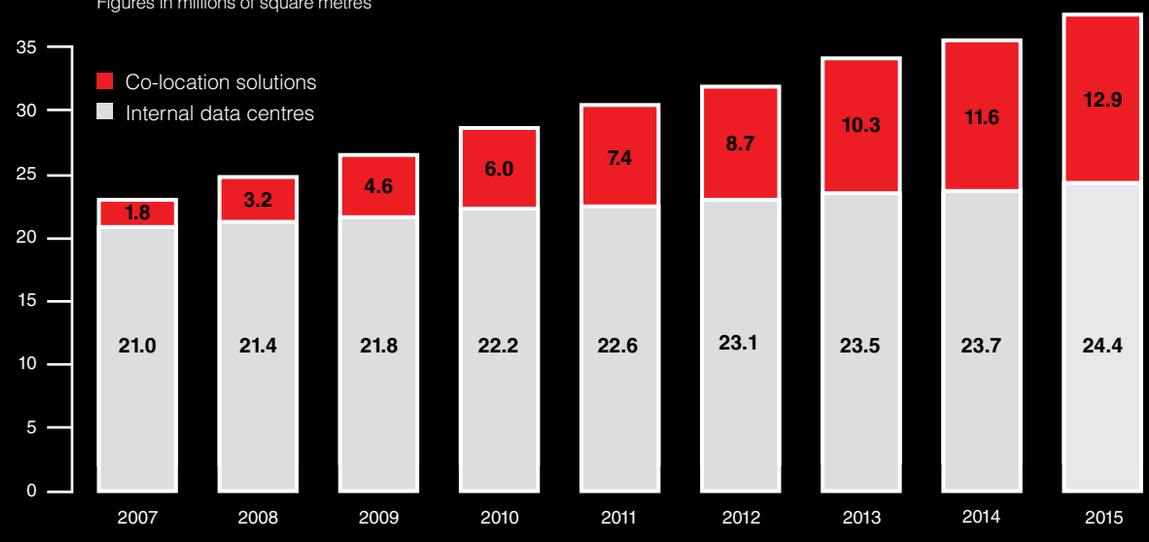
DIMENSIONS (TO SCALE)
What is concealed beneath the ground would require vast amounts of land and entail enormous construction costs.

GROWING DEMAND FOR CO-LOCATION

COSTS ARE AN IMPORTANT FACTOR IN THE DECISION TO OUTSOURCE DATA CENTRES

The housing of technical infrastructure and its utilisation and connection to networks for the data centres of external service providers (co-locations) are increasing to a much greater extent than the expansion of in-house data centre solutions. This trend is being facilitated by new technical developments and the possibility of reducing IT costs in this way.

Figures in millions of square metres



Source: DCD Intelligence

"We're developing the Norwegian solution with Rittal and IBM, which is highly efficient, inexpensive and secure."

Egil Skibenes, Chairman of the Board LMD

STANDARDISED SUCCESS

AAC TECHNOLOGIES
AAC Technologies, based in China, safeguards its computing power with two RiMatrix S Double 9 systems. The company manufactures micro-components for loudspeakers, smartphones and earphones.

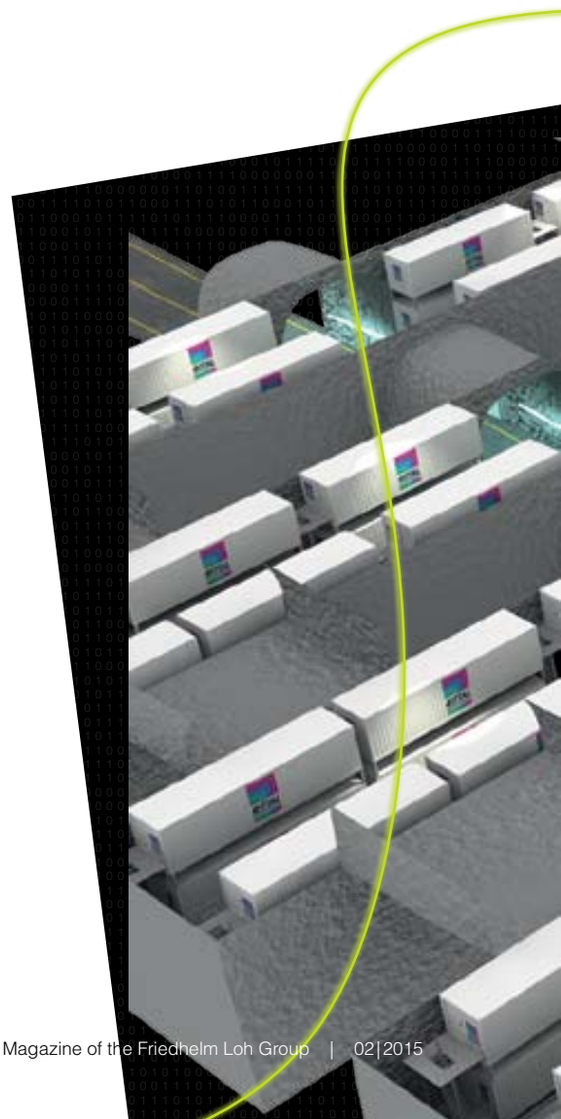
DFS DEUTSCHE FLUGSICHERUNG
DFS, responsible for controlling Germany's airspace, has a new data centre in Munich with 500 Rittal TS IT racks. A majority of air traffic control over southern Germany and part of eastern Germany is handled from this location.

PROSEGUR
Prosegur, Germany's market leader in transporting money and valuables, houses all of its critical network components and more than 50 physical and 50 virtual servers in twelve Rittal TS IT server racks.

ical data centre in the open countryside. "The mine already exists," Skibenes says. Thus the outer walls and power supply are not an issue. "In comparison with a data centre built above-ground, the costs are halved." Because the mine provides natural protection against electromagnetic pulses and perimeter fencing and monitoring is limited to just two entrances, security expenses are much, much lower. "With electricity costs taken into account, we offer a leading pan-European product as regards cost-efficiency," Mats Andersson says. "If we went online today with a fully developed LMD, the energy costs would run about 150 million euros. We estimate an equivalent facility in Germany would cost 300 million euros, in the United Kingdom perhaps 500 million."

ADVENTUROUS NORWAY

Norway's economic policies are also playing a significant role in this huge project. LMD is being subsidised by the government. The government and Norwegian industries recognised that this data centre solution offered a possibility to become a leading global player in the area of data processing. To date, commercial sectors such as fishing, forestry, and oil and gas production form the backbone of the Norwegian economy. The production surplus of – solely renewable – energy facilitates favourable prices. "Precisely because data centres have such enormous energy requirements, Norway is incredibly attractive with its renewable energy sources, reliable power supply and low energy costs," says Norway's Minister of Petroleum and Energy Tord Lien. "Our climate offers the best conditions for natural cooling techniques." Norway is responding to the rising demands of the digital revolution – which require increased data centre capacities – by utilising the possibilities of hydropower, by strengthening the network infrastructure and by offering tax benefits for large data centres. "We want to be a part of this industrial adventure," the minister adds. "After the energy revolution, we now have our eyes on the digital revolution." And why not export data when Norway is already delivering energy to other countries?
With these ambitious goals, Norway could also further improve its overall economic situation in the future and create additional jobs. Data centres are a strategic factor for the industrial sector. The connection between data centre sites and economic out-



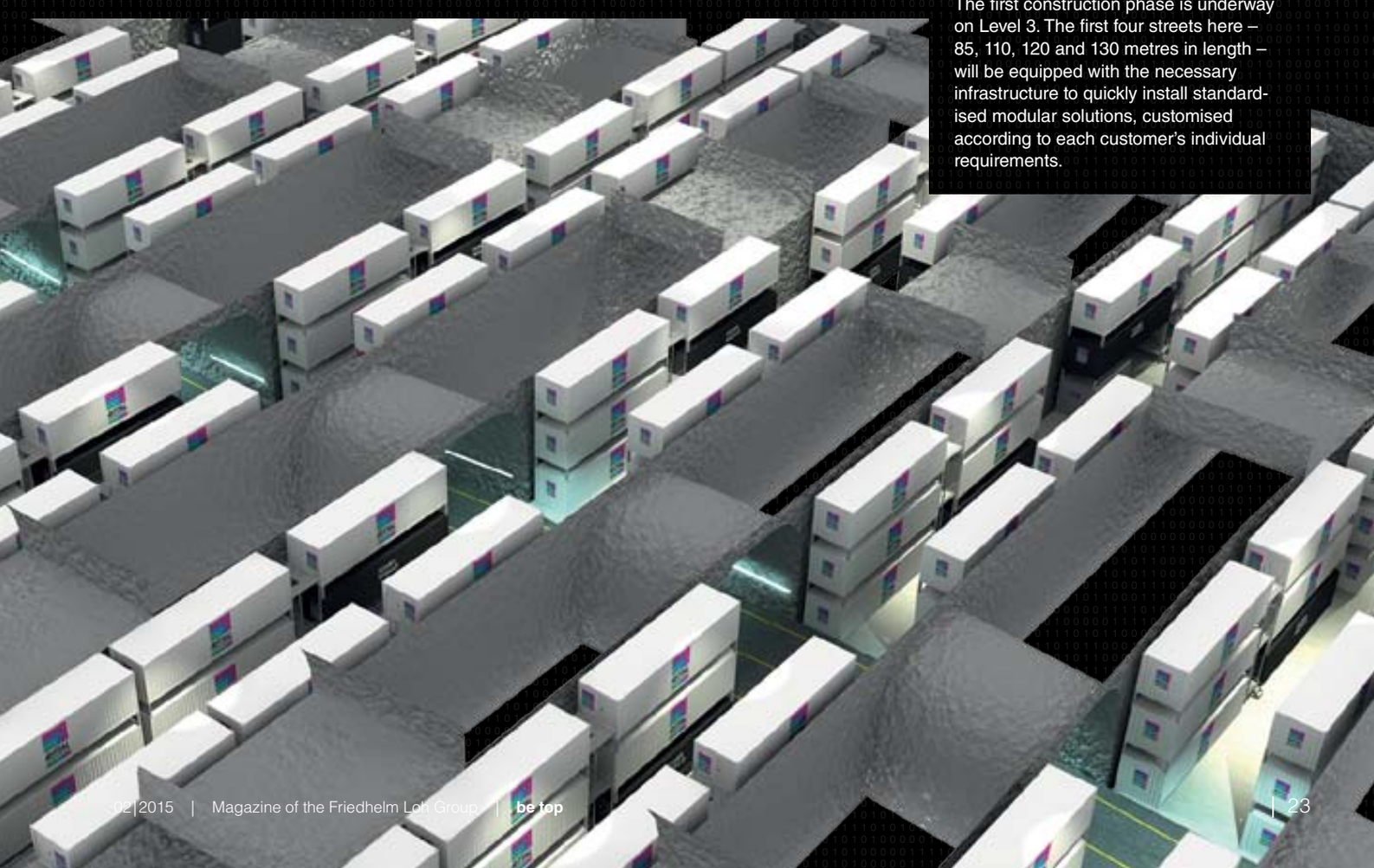
put was confirmed by a study conducted in 2013 by DCD Intelligence, a market research institute. The study identified the United States, Japan, Great Britain, Germany, China and France as the six countries with the greatest amounts of space dedicated to data centres worldwide; and according to the International Monetary Fund, these six countries have the highest gross domestic product globally.

LMD could become a significant driver of growth for entire economic sectors in Norway. It is already exemplary for the European data centre market, even though the first customers will not be moving in until August 2016. Among them: IBM. The company, which has been involved in LMD planning, implementation and quality assurance since day one, will be one of LMD's first rental clients and is counting on the high security, modern efficiency and low operating costs. "Data is becoming the world's newest resource, and I can't think of a better place to store it than Lefdal," Norheim says. He also reveals IBM's motto – which applies to LMD as well: "We think big, start small, and grow fast." The motto applies to LMD in that its visionary goal is likewise being methodically implemented.

Yet its start is anything but small. "In the first phase, we're installing 30 megawatts of cooling infrastructure," Andersson explains. "That's the equivalent of Norway's entire data centre industry." Data centre capacity will be built up in steps of 7.5 megawatts up to the final capacity of 200 megawatts.

"No one imagined that the mine would still be functioning as an employer long after its decommissioning," says a pleased LMD Technical Director Rolf Kristiansen. Like many of his colleagues who will be working at LMD, he used to travel into the mine's depths every day when minerals were being mined out of the rock masses. Which makes it all the more curious that the modern term "data mining" – digging for knowledge in a mountain of data – so perfectly suits this context. Call it an irony of the IT era. ■

→ LINK TIP:
Scan the QR code for more information about Lefdal Mine Datacentre.



COMMISSIONING IN SUMMER 2016

The first construction phase is underway on Level 3. The first four streets here – 85, 110, 120 and 130 metres in length – will be equipped with the necessary infrastructure to quickly install standardised modular solutions, customised according to each customer's individual requirements.

INTERVIEW PARTNER

Who? Christine L. Borgman is Distinguished Professor and Presidential Chair in Information Studies at the University of California, Los Angeles.

What? Borgman has written more than 200 publications in the fields of information studies, computer science and communication. She has received a wide variety of accolades and awards for her work on science in the digital era.

Where? be top interviewed Christine L. Borgman at her home in Los Angeles.

DATA ARE MORE PROCESS THAN PRODUCT

Research about big data. Professor Christine L. Borgman at the University of California, Los Angeles (UCLA) studies data and the question of what the flood of data does to people. In this interview she speaks about how data achieves relevance and when it is "big."

Interview: Klaus Rathje


DICTIONARY

DATA IN CONTEXT
As Christine L. Borgman explains, the furnishings and structure of her office could allow you to draw conclusions about her person. Taken out of context, however, this data lacks all significance.

Ms Borgman, you're a Professor of Information Studies. What does this involve?
Christine L. Borgman: It's about the design and management of information systems as regards libraries and archives, but also social media. We take a broader look at the topic, so along with the technical aspect we also examine social and cultural issues and to what extent the flood of information influences people's lives. But it's also about the challenges of saving information over longer time periods, meaning decades and centuries.

What is the "big" in "big data" about?
Borgman: "Big data" describes everything that you can no longer interpret with the available tools. So it's a relative term. The "big" doesn't refer as much to the amount of data: for some people just a few megabytes of data to analyse might already be big in this sense, for others it may not become excessive until they reach the petabyte range. Even in the era of supercomputers, evaluating data isn't all that easy. Think about the CERN research facility: 99.9 per cent of the data generated there are superfluous. Just 0.1 per cent is relevant for the research results.

When did the term big data start being used?
Borgman: The term "big science" emerged back in the early 1960s in the context of space telescopes, for instance, where they were already dealing with large amounts of data that had to be analysed. Big data in the sense that it's used today came about in the 1990s. Right now we're still in a hype phase that will certainly continue for a few more years.

In your book *Big Data, Little Data, No Data: Scholarship in the Networked World,* you wrote, "*Data are more process than product.*" Could you explain that?
Borgman: I'd love to; it's one of my favourite topics. It's important for a person to realise that data are not things, they aren't brilliant objects sitting on a shelf somewhere. They don't become something until someone uses them. Take Twitter as an example. A tweet first comes alive in interaction with others. Then a tweet can say something about the relationships between people or even influence a corporation's stock price. So it is first the interpretation of tweets that transforms them into data. For this interpretation we have to know who created the data and for what reason. Merely being in possession of data isn't of any use yet. That's what I was trying to point out with my statement. Data therefore require a certain context that helps us be able to interpret them. And that then is a process.

So it isn't until I place information in relationship to something that I have data?
Borgman: Yes, data are simultaneously everywhere and nowhere. We're surrounded by all sorts of information and signals. But at what point do they become data? That is always related to the context in which we view this information. We're conducting this interview via Skype. Behind me you can see how orderly the books are placed on my bookshelf and how many pens are on my desk, what type of com-

> “Having good data, both in science and in business, is a real competitive advantage.”
>
> Christine L. Borgman

puter I have. You can draw certain conclusions about my person through these details, but if you take this information out of my context, they are no longer data because they are lacking every bit of significance.

Are data the new global currency?
Borgman: Well, in science there are some experts who collect data in their fields their entire lives and take it from one scientific institute to the next. These data sets therefore amount to a life’s work. At a company, this would be customer and product data. Having good data, both in science and in business, is a real competitive advantage.

How should we deal with data in the future? It seems that national governments are simply overwhelmed as far as legislation is concerned.
Borgman: True, but legislation is almost always lagging a decade behind. What we’re concerned with at UCLA is the question of how we can deal with data governance more generally. What values must we protect, particularly where customer data is concerned? Governments of various countries want to grant themselves the right to have access to data through the back door, so to speak, for instance from Google. Europe is much more progressive with respect to personal privacy protection than is the United States. This is shown not least by the fact that European companies are extremely cautious about transferring data into the United States or through American data centres. And overall it is very difficult to write laws about all of this. There are customer data, electronic patient files – it’s getting increasingly more complex, and in its breadth can barely be completely captured legally. The same holds true for international cooperation. For instance, if we receive German research funding for a multinational project, we must take into account Germany’s in part stricter data protection laws. I myself advise various governments on these questions because we need harmonisation worldwide in this area.

What is your next research project about?
Borgman: My next project examines the question “If data sharing is the answer, what is the question?” This is meant to the effect that for data, you should always make clear why you want to share it with others. Nowadays people are overwhelmed with data and have to throw away the majority of it. But what are the most important criteria in separating important from unimportant data? And who should be saving what for how long, and who will pay for it in the end? The focus here at the moment also includes the areas of astronomy and biomedicine, where a lot of data accrue that ultimately affect humankind as a whole. ■

➔ READING TIP:
Big Data, Little Data, No Data: Scholarship in the Networked World by Christine L. Borgman

➔ APP TIP:
See more impressions from California in the be top app.

A STRATEGIC MANOEUVRE
Representatives from Rittal and IBM Resiliency Services signed the contract for the Strategic Partnership Alliance on 18 August.

PREFERRED PARTNER

RITTAL AND IBM INTENSIFY THEIR COLLABORATION

AGREEMENT
Rittal TS IT server and network enclosures are to be deployed in the future in all IBM data centres in Europe.

In mid-August, Rittal and IBM Resiliency Services forged a strategic partnership for professional data centres. The Herborn system provider of enclosures has already been supporting IBM for several years with planning, construction, operations and service in its project business with data centres. With the signing of the contract, Rittal is now one of IBM's preferred partners and suppliers in Europe, Africa and the Middle East. This means that in addition to racks, climate control solutions, power supply and monitoring systems, stronger security solutions, services and the standardised RiMatrix S data centre are now in use at IBM. "With the high quality, security and efficiency of the IT infrastructure components from Rittal, IBM can offer its customers professional data-centre solutions with outstanding availability," says Brian Farr, Director Business Continuity and Resiliency Services Europe at IBM Global Technology Services. IBM wants to rely on Rittal technologies more heavily in its own data centres in the future as well: in early September, the company collaboratively decided with Rittal and its installer and distributor, Anixter, to equip IBM's European data centres with TS IT server and network enclosures over the next five years. The racks, which are fully installed with hardware components, are easily integrated on site into the existing data centres using plug and play.

→ LINK TIP:
Scan this QR code for more information on the RiMatrix S data centre by Rittal.

RAPIDLY CONFIGURED

CHILLER DESIGN IN JUST A FEW STEPS

Thanks to the new Rittal TopTherm Chiller configurator, it is now easier than ever for engineers and technical buyers in mechanical engineering to design machine and process cooling systems. This online tool provides support to precisely determine the required cooling capacity, quickly select the appropriate solution and automatically compile all technical data – all in just four steps. “More than 8,000 hits within just three months show that the new configurator offers real value for our customers,” says Rittal Climate Control Product Manager Hakan Türe. The Rittal configurator is available in seven languages on the Web (www.rittal.de) and also as an offline version.

➔ LINK TIP:
Find out more by scanning the QR code or going to
http://tinyurl.com/chiller-config-en

4

CLICKS TO THE FINISH

NEW EPLAN INFO CENTER APP

The Eplan Info Center app has been updated and now offers significantly improved handling and direct access to the latest company news, product information, videos and event notices. Trainings can also be booked more quickly and easily.

➔ LINK TIP:
www.eplan.de/apps

SIMPLY WIRED

THE NEW EPLAN HARNESS PROD

Since October, the new Version 2.5 of EPLAN Harness proD has given users a continuous workflow from the wiring plan through to production. The system for 3D cable harness engineering is easy to connect to the central parts administration of the Eplan platform. Because the 2D symbols needed for nailboard drawings are also derived automatically from 3D data, the integrated management of master data is part of the standard. A new display configuration allows users to display drawings differently without changing the data, thus aligning them with company standards. The software is also suitable for electrical engineers without experience with M-CAD systems.

TOUR
Guests at the first LKH Expert Day also got a look at ongoing production at LKH.

EXPERT DAY

FOCUS ON LKH EXPERT DAY: PLASTICS IN ELECTRONICS

Thirty guests from renowned research institutions and companies discussed the latest trends and developments in plastics technology at the first LKH Expert Day on 10 September. The focus of the event, held at the LKH head office in Heiligenroth, was on thermally conductive plastics, electrically neutral compounds and UL certification in the field of electronics and electrical engineering. The high level of innovation became clear during a production tour: under the motto “Next Level for LKH,” the company invested in a new laser sintering system in 2014. “We are increasing our expertise to benefit our customers and their sophisticated requirements,” says Rüdiger Braun, Director Sales and Engineering at LKH. The event will remain tailored to individual sectors in the future as well. The focus for 2016: plastics applications in the automotive industry.

ECONOMIC HIGH-SPEED PRODUCTION

Cooling units. Up to twenty thousand cigarettes per minute run through the high-speed equipment at Philip Morris in Berlin. Although the tobacco giant's production facilities are constantly in operation, the company is extremely efficient with its energy use. Philip Morris is currently testing the new Blue e+ cooling technology for additional energy and cost savings.

Text: Hans-Robert Koch

MANUFACTURING

HOW A CIGARETTE GETS MADE

Philip Morris International is the world's largest manufacturer of tobacco products, including Marlboro, the world's top-selling brand of cigarettes. In the company's factory in Berlin, the second largest in Europe, about 60 billion cigarettes were manufactured in 2012, 58 per cent of which were destined for export. Cigarette production is a three-step process: processing the raw tobacco, producing the cigarettes, and packaging as well as preparing for distribution. Cigarette manufacturing is a largely automated process with production rates of up to twenty thousand cigarettes per minute.

Philip Morris is constantly working towards reducing its carbon dioxide emissions. Its cigarette factory in Berlin is considered an innovative trailblazer for the firm's other international factories. "By the end of 2015, we want to reduce energy use in production by 20 per cent as compared to 2010," says Christian Lefherz, Supervisor for Electrical Support and Maintenance in Cigarette Manufacturing and Packaging at Philip Morris in Berlin. Measures being taken in Berlin include the use of waste heat to heat water and produce steam, the installation of both efficient lighting technology and thermally insulated windows, and enhancement of the building's overall insulation. The company is also planning to exploit as much potential efficiency as possible for cooling enclosure technology. Since January 2015, Philip Morris has been checking to see if replacing enclosure cooling units with the newest technology is actually worth the effort.

And so the company is testing Rittal's new Blue e+ cooling units with a cooling performance of 1.5 kilowatts (kW) against a competitor's cooling unit with 1.1 kW of performance on two Focke 550 series packaging lines being utilised at identical rates. "So that we can actually compare apples to apples through the end of the year, we're also testing the two comparison devices on identically built-out enclosures," says Robert Wollmann, responsible for supervision maintenance and electric at Philip Morris Manufacturing GmbH.

Although the trial is supposed to run for more than a year, significant differences in electricity usage already began showing towards the end of August. In the time period covered, the cooling unit previously in use consumed 724.8 kilowatt-hours (kWh) of power, whereas Rittal's new Blue e+ cooling unit consumed just 123.1 kWh, demonstrating a savings of 83 per cent. "That definitely surprised us," says Christian Lefherz. The reason for the high energy efficiency of Rittal's newest generation Blue e+ cooling units is a pioneering patented hybrid system, which works with a combination of a classic compressor-based cooling unit and a heat pipe. A heat pipe becomes particularly interesting as a solution when there is a temperature difference between the enclosure's interior and its surroundings. An enclosure interior temperature of 35 degrees Celsius (°C) and an ambient temperature in the factory of 25 °C are ideal for a heat pipe. With a Delta T of 10 Kelvin, the heat pipe alone could handle a dissipation loss of 600 watts without operating the compressor at all. Within the testing period, the compressor did not have to be fired up even once because the cooling capacity delivered by the heat pipe was sufficient to adequately cool the enclosure's interior.

EXACTLY AS MUCH AS REQUIRED

"If the ambient temperature rises over the course of the year, the compressor technology does switch on, but it is also highly energy efficient," says Rittal Climate Control Product Manager Christine Ronzheimer. The new cooling units have DC motors for both the fans and the compressors. The exact amount of cooling performance necessary is made available by way of the inverter technology, through which a voltage control is used to set the speed of the compressor and the fan. This capability considerably reduces energy consumption vis-à-vis traditional two-point controller solutions. These traditional solutions switch the cooling on when a set maximum value is reached – usually 35 °C – and cools with the unit running at 100 per cent performance until the set lower temperature threshold is reached. This approach is not particularly energy efficient, and also leads to high temperature differences within the enclosure. The very high energy efficiency of the new Blue e+ cooling units is particularly interesting for Philip Morris because the investment in such energy-efficient technology pays for itself in just a few months through the savings in electricity costs.

While plenty of energy will be saved in the future through the regulated cooling performance, the compressor's service life will also be lengthened, as it primarily depends on the number of times the compressor is powered up. With the speed regulation, power-ups become very seldom, so that wear and tear is minimised. And this regulation – in which the temperature is kept constant – is also better for the components within the enclosure."The constant temperature swings in the classic two- ➔

At the start of cigarette manufacturing, a continuous cigarette is produced, what is known as the "rod." In this process, an up to 7,000-metre-long strip runs from a roll of cigarette paper upon which the tobacco is placed. Afterwards, the tobacco is enclosed within the paper into a finished rod. Machines next cut the resulting continuous cigarette into shorter pieces, and then filters are placed at both ends of these shorter pieces. The filters are then wrapped with tipping paper – the paper around the filter that makes it clearly visible for consumers. Each of these rod pieces is then divided once more, resulting in two filter cigarettes.

83%

energy savings were demonstrated by Rittal's new Blue e+ cooling unit as compared to a competitor's device in the testing period from January to August 2015.

"With the new Blue e+ cooling units, Philip Morris saves a total of 55,000 euros in energy costs annually."

Christian Lefherz, Supervisor for Electrical Support and Maintenance in Cigarette Manufacturing and Packaging at Philip Morris

HEAT PIPE

USING GRAVITY

The centrepiece of the Blue e+ cooling unit is the patented combination of a heat pipe with the classic compression refrigeration circuit. The heat pipe uses the refrigerant's evaporation heat and allows a high heat flux density. The refrigerant circulates within the heat pipe through the force of gravity alone. It sinks to the heat source, evaporates and locally increases the pressure in the vapour space. The resultant pressure gradient lets the vapour rise and flow to a point with a lower temperature, where it condenses. With a positive temperature difference between the enclosure's interior temperature and the ambient temperature, about 60 per cent of the thermal load can be discharged through the heat pipe without any additional circulating pump. The higher the positive temperature difference between the enclosure's interior temperature and the ambient air, the more efficient the heat pipe becomes. As such, a 1.5-kilowatt cooling unit can dissipate 900 watts of cooling performance with the heat pipe alone if the target temperature of the enclosure is +35 °C and the ambient temperature is +20 °C.

➔ LINK TIP:
http://www.rittal.com/de_de/blue_e/plus/public/#efficiency

point control system expose components to constant thermal stress, which is not the case in the new control system," Christine Ronzheimer explains. "This is much better for the components inside the enclosure, thereby increasing their service life."

Doing the math shows that Philip Morris Manufacturing GmbH would enjoy vast cost savings if the company swapped out the 140 cooling units currently in use in cigarette manufacturing and packaging. "With the new Blue e+ cooling units, Philip Morris saves a total of 55,000 euros in energy costs annually," Christian Lefherz says. He adds, "As soon as the devices are widely available, we will introduce them and make them compulsory for our machine suppliers for our 38 international factories." He expects a return on investment in about sixteen months.

Another advantage for the Berlin factory is that the devices are multi-voltage-enabled. The devices can be used with practically all of the normal voltage ranges and frequencies available globally. The possible input voltage range runs from 110 volts (single-phase) to 480 volts (three-phase) for power frequencies of 50 or 60 hertz. This multi-voltage capability is made possible by the inverter technology used. Lefherz sees this as an advantage especially for original equipment manufacturers that distribute their machines and thus also enclosures and cooling units to Philip Morris factories around the world. Now just one cooling unit needs to be in stock and installed whether the machine is being delivered to Japan, the United States or within Europe. By the same token, previously installed cooling units on enclosures that are now failing can easily be swapped out without any costly modifications having to be carried out due to a different power supply voltage.

FAST DEVICE SWAPPING

Production speeds in the high-speed area of cigarette production make increased availability of the installations mandatory. If servicing is required, then devices must be swapped out quickly. For the new Rittal cooling units, the cut-outs in the side panels or the enclosure door remain the same for all devices – and it matters not which mounting model was chosen, whether internal, partial internal, or external. This means that no elaborate adjustments to the installation are required, for instance when a cooling unit with a larger cooling output is needed. The installation has also been improved: practical installation clips simplify the handing and fixation of the device onto the enclosure. For partial internal mounting, the fan and earthing cable no longer have to be disconnected. These innovations simplify logistics and warehousing, and ensure shorter working hours – both in engineering and in assembly and installation. ■

VERY GOOD VERSUS WORLD'S FIRST

For years now the Blue e generation of cooling units has been delivering excellent results for countless industrial applications through its low energy consumption. The following comparison shows that thanks to its innovative hybrid technology, the successor generation Blue e+ ensures revolutionary energy efficiency, is enormously flexible in its possible uses, has intelligent interfaces and promises less thermal stress.

Blue e

- ++ Savings of up to 45 per cent in energy use for the same cooling output as compared to conventional cooling devices (2011)
- ++ Net cooling capacity of 0.3 to 4 kilowatts
- ++ Various devices required for different voltages and grids worldwide
- ++ EC fan and ECO mode regulation
- ++ Operation via comfort controller
- ++ Installation for external, partially internal and full internal mounting; no installation cut-outs needed; 45 combination possibilities

Blue e+

- +++ Savings of up to 75 per cent in energy use for the same cooling output as compared to conventional cooling devices (2015)
- +++ Net cooling capacity of 0.3 to 6 kilowatts; flexible performance
- +++ One device for all voltages and grids worldwide
- +++ Active refrigeration circuit with variable-speed components for demand-driven cooling; integrated heat pipe for passive cooling
- +++ Simple operation through touch display; remote monitoring via Ethernet
- +++ Installation for external, partially internal and full internal mounting; uniform installation cut-outs

THE 24h RACE

Logistics. In order to guarantee its customers fast, accurate and reliable deliveries, Rittal is investing in its logistics. Delivery service within 24 hours, which has already been implemented almost nationwide in Germany, will become the standard.

Text: Joscha Duhme

The latest crime novel from a favourite author, an incredibly low-priced pair of shoes or the latest smartphone are always just a click away in the big online stores. It usually takes just 24 hours for the package containing yesterday's digital shopping cart to be delivered to the door. "From our point of view, optimal commission and order processing for our customers is obviously the focus as well, in the spirit of customer excellence," explains Holger Michalka, Vice President Internal Sales at Rittal. "And the trend is that switchgear manufacturers also need their enclosures to be ever faster and more flexible, as is already customary when buying shoes in the B2C sector."

RISING COST PRESSURES

Customers are feeling the pressure of costs and globalisation. "They are being forced to become more efficient at all levels of value creation. Warehousing costs money and reduces flexibility, so it is increasingly important for our customers to be able to obtain supplies at short notice and precisely when they need them," says Michalka, citing reasons for developing more flexible and demand-based production. To achieve this, companies are relying more on powerful partners who can deliver the required products quickly, at any time, anywhere across the globe. This is precisely where Rittal and its professional logistics structures come in. "A global market leader is expected to deliver not only leading products but also leading processes. We hold ourselves to this standard as well," affirms Andreas Nögel, Vice President Global Logistics at Rittal. "The primary task of logistics used to be to coordinate our own goods flows. Today it serves as a crucial competitive factor for us. Those who can deliver quickly and accurately on the required date are the ones to land the deal," Nögel continues. And Rittal delivers fast. "We have already implemented 24-hour service in German delivery centres. ➔

GLOBAL DISTRIBUTION CENTRE
The warehouses in Haiger (the shuttle warehouse is shown here) and Rittershausen form a linchpin for global transport, storage and handling.

THE LOGISTICS PROVIDERS
Holger Michalka, Vice President Internal Sales, and Andreas Nögel, Vice President Global Logistics, are responsible for the efficient logistics structures in the Global Distribution Centre.

After the nationwide implementation in Germany by early 2016, it will gradually be introduced in the subsidiaries," says Nögel. "After that, both the amount of handling and ramp contacts will be reduced for our customers," he explains. In regions with good infrastructure, the goal will be to deliver serial products locally within 24 hours.

TRANSPARENT PROCESSES

"This is a new level of flexibility we're offering our customers. It allows them to have a much shorter lead time; they don't have to do complex rescheduling or post processing in the supply chain," says Michalka.
With its 24-hour delivery service, Rittal creates real benefit for customers and accelerates the value chain while also providing high efficiency. This is also borne out by the customer satisfaction survey for which Rittal carried out five hundred interviews in Germany in 2014. The results showed that speed was customers' top criterion for order processing; together with the price-performance ratio, it has the strongest influence on their overall satisfaction.
But efficient structures and high product availability alone do not guarantee swift and customer-oriented logistics. "Information is also gaining tremendous importance in logistics. This is why its clever management at the interfaces is important, as is the fast and transparent handling of the entire order process – from customer to customer," explains Michalka. Rittal can offer a lot in this area too, having identified and made use of opportunities to accelerate processes and reduce overhead for customers. As Michalka recalls, "it used to be that if customers found that stocks were low, they would order from their supplier by fax, phone or email. The incoming new order would be recorded manually and converted into a production or logistics order, which would then be printed in the logistics division ...." Michalka could add many other process steps to the list, such as commissioning or delivery. But what was once routine now costs logistics experts too much time even to explain. "These process chains are where the action is: you can gain significant speed with them." Rittal has therefore created platforms that enable customers to enter orders into the Rittal system independently, regardless of business hours. The online shop at www.rittal.com/shop offers the full assortment of Rittal products at the click of a mouse 24 hours a day, 7 days a week.
"Customers can use our configurators and selectors to put together their own product solutions from the Rittal construction kit in real time and receive a variety of technical product details," notes Michalka. It is also possible to connect the customer system directly to Rittal's ERP system via an EDI interface, which enables exchanges between the ordering systems without manual intervention. For example, the electrical wholesaler Sonepar already handles 91 per cent of its orders from Rittal via EDI – seven truckloads daily.
"That's the path we're taking and the one our customers want: we're interlacing the systems and handling all processes in real time," Michalka declares. The advantages

“Those who can deliver quickly and accurately on the required date are the ones to land the deal.”

Andreas Nögel, Vice President Global Logistics, Rittal

of this immediate exchange present new challenges to logistics providers. “We are no longer dealing with only material, but also with information flows that we manage together,” says Nögel. A typical example of customer-oriented information management is the integration of the SAP viewer. This tool gives customers access to the Rittal systems – and thus also to the desired information about order status, availability, prices and delivery dates.

NETWORKED IN REAL TIME

Logistics is increasingly being requested in discussions with customers, and Michalka explains to them how Rittal reduces time and costs by increasing its range of services. “We transmit the delivery slips in advance electronically so that the customer can select received goods and plan for pending deliveries. This tremendously reduces the overhead in goods receipt.” Precompiled packing lists that clearly indicate where on the pallet the components of the delivery are stacked, help to obviate long searches. “There are also plans to play back the tracking data of the transport service in our system, so that we can use an order number to consistently see where the products are at any time – no matter which haulage firm or parcel service carries out the delivery,” says Michalka. The range of products, unique in the market, allows for “one-stop shopping” and delivery, thereby reducing the number of suppliers reaching the customer daily.

“All of these developments in the logistics sector have one big goal: to accelerate processes and inspire people,” says Michalka with conviction. “The continuous development of business and logistics processes at Rittal is being driven by our optimally trained and highly motivated staff. We always keep in mind the benefits for our customers, and above all to provide fast, accurate and reliable delivery of our products.” Rittal: Faster – better – everywhere. ■

→ APP TIP:
Get a closer look at the Global Distribution Centre through the be top app.

GLOBAL LOGISTICS

INVESTMENT IN SERVICE

Germany: Thanks to sophisticated logistics systems and increased capacity, the Global Distribution Centre (GDC) in Haiger can accelerate processes even further. It is one of the most modern logistics centres of its kind in Europe. The GDC has space for 20,000 pallets and 50,000 compact enclosures and air conditioners. The investment of 40 million euros is an important step for comprehensive 24-hour delivery service in Germany and Europe.

USA: Building transport and logistics networks in a large country like the United States is challenging. Rittal has identified 17 metropolitan areas for focused customer service. For standard products, Rittal guarantees a delivery time of 48 hours within a 400-mile radius of the warehouse. This is why the company has selected its sites in such a way that all urban cores can be reached from them. The products manufactured and temporarily stored in Urbana, Ohio, are taken to logistics complexes in Atlanta, Georgia; Sparks, Nevada; and Houston, Texas; as well as to subsidiaries in Canada, Mexico and increasingly also South America.

South Korea: The delivery promise “Faster – better – everywhere” is true in South Korea as well, as shown by the construction in Incheon of a new administrative and logistics building with 4,000 pallet spaces. The investment will help to unify global delivery time and availability at a top level for the core product range. The involvement in South Korea is a commitment to the Korean market, where the system specialist Rittal has attained double-digit growth for more than ten years. South Korea’s international market leadership in many industries relevant for Rittal makes it very important for the global growth strategy of the company.

MAKE IN INDIA

Market. Indian Prime Minister Narendra Modi's "Make in India" government programme should improve conditions for domestic and foreign investors. The demanding infrastructure project is relying on "Made in Germany" quality.

Text: Elke Bieber

8.9

(= very good) out of a maximum of 10 points from its Indian customers for Rittal's product quality. This is the company's strongest asset.

SATISFACTION SURVEY 2014

THREEFOLD PRAISE FROM CUSTOMERS

In comparison to 2012, Rittal has greatly improved in the perception of its Indian customers. The findings are based on surveys of approximately 300 customers, who rated Rittal on various aspects on a scale from zero (not at all satisfied) to 10 (completely and fully satisfied). This generated the following improvements in percentages:

+ 14.5 %

Sales and consulting: in this sector, which has a major impact on customer loyalty, Rittal India has improved by 14.5 per cent since 2012.

+ 13.6 %

Logistics: the efforts by Rittal for intelligent and customer-optimised logistics worldwide are bearing fruit.

+ 12 %

Aftersales service: this area has an immense influence on the overall satisfaction of customers in India. Rittal was able to increase its ratings from customers in this area as well.

Decrepit buses, noisy taxis, overflowing trains – anyone accustomed to the quiet traffic between Greifswald and Baden-Baden in Germany would be shocked by the bedlam and racket, the speeding and the ramshackle roads in India's cities. More and more cars are flooding into the megacities of the subcontinent. Adding to the fray are rickshaws and cyclists, motorcycles and oxcarts, pedestrians, horses and monkeys.

India's road network is the second largest in the world and the most important mode of transport in the country. But most of the roads do not meet international standards. Other factors that slow down logistics performance are tollbooths, long waits at the borders between the states and the limited entry time for trucks in many Indian cities. On average, a truck reaches its destination at only 35 kilometres per hour.

This is why, of all infrastructure programmes, better roads are the most important factor in the welfare of India's economy. A sophisticated logistics concept is necessary for anyone wishing to transport high-tech products.

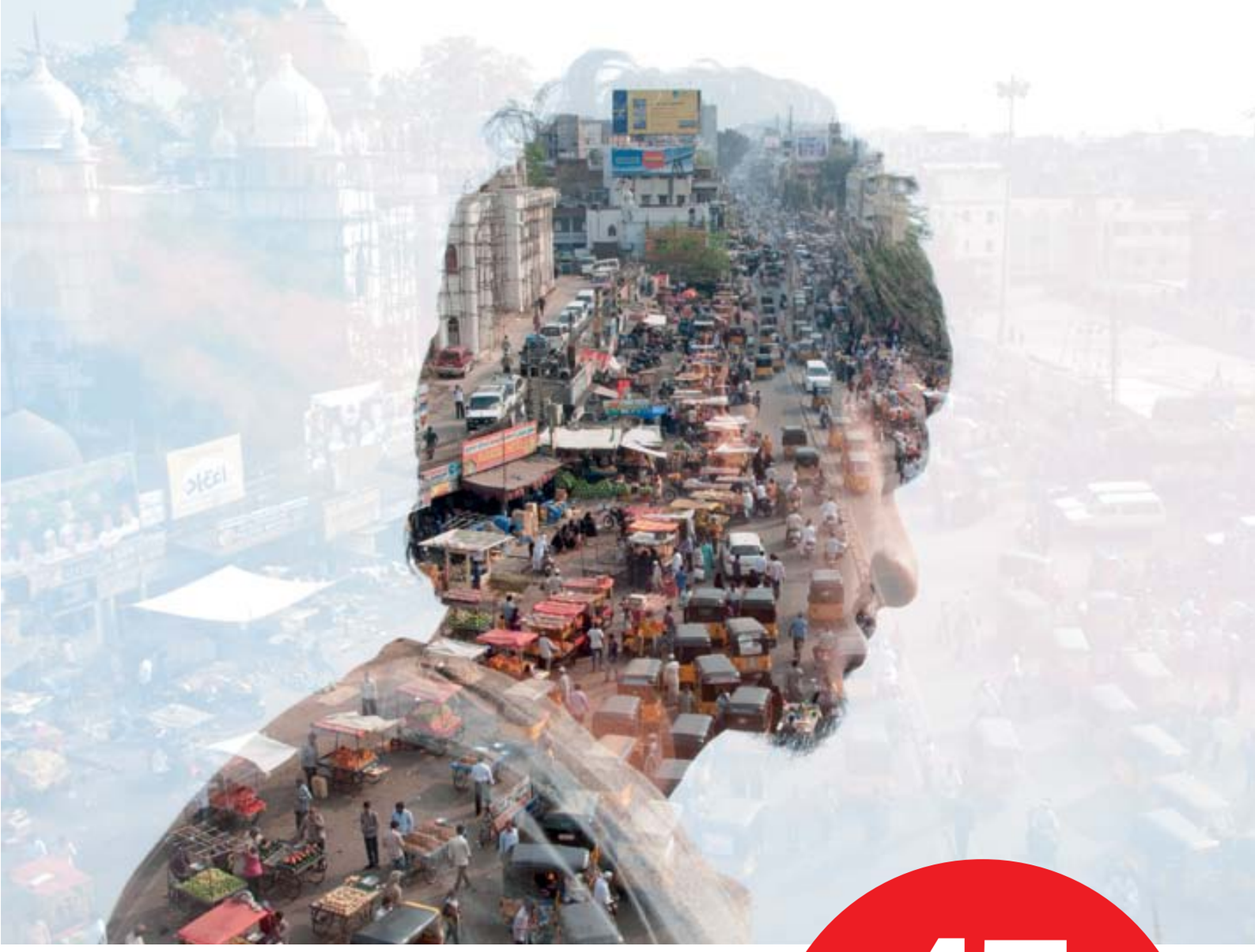
As Ajay Bhargava, Managing Director of Rittal India, puts it, "If anything is holding us up, it's the infrastructure." Last year, India's government launched the wide-ranging "Make in India" programme to improve the conditions for domestic and foreign investors, especially through infrastructure offensives. Bhargava has been attentive to this. "Even if only half of the declarations are implemented, we are still very well positioned." In the meantime, the reality looks like this: "Recently a fully loaded truck turned over; the whole delivery was ruined," reports Bhargava. "Transport damages are one of the main reasons for customer complaints – but they're not nearly as severe as fifteen years ago. Infrastructure changes take time."

For Rittal itself, the growth programme "Make in India" means far more than the hope of better transport routes – it offers great opportunities to participate in the modernisation of Indian industry. The erstwhile agrarian country has indeed evolved into a strong service provider, but industry's proportion of the economic performance of the country remains at just 25 per cent. This should change. Prime Minister Narendra Modi's objective is for Indian companies to become more productive and for international corporations to introduce fewer goods: these should instead be manufactured locally. The government subsidies policy is focused on the electronics industry. It includes actors at very heterogeneous levels of technology. Experts estimate that by 2020, the demand for electronic devices will quintuple (compared to 2012), to around 400 billion US dollars, so Rittal is gearing up for an investment boom in the electronics industry.

MAJOR GROWTH IN ENERGY

The production of technology in power generation, transmission and distribution should also continue to grow strongly. The market volume of each has increased by around 10 per cent in recent years. The Indian Electrical Equipment Industry Mission Plan 2012–2022 aims to quadruple sales in this sector within ten years, to 100 billion US dollars. The ratio of imports to exports is expected to have equalised by then as well. This can only happen if extensive resources go into manufacturing as well as into research and development. Rittal is already contributing its cutting-edge technology to numerous projects and expects further growth (see the interview with Bhargava on page 43).

The systems specialist has been present in India through a subsidiary since as early as 1994, ten years longer than it has



47

per cent is Rittal's Net Promoter Score, an indicator, that tops the international B2B benchmark by almost 100 per cent. The figure is a measure of customer loyalty. It is calculated from the responses to the question, "How likely is it that you would recommend Rittal to others?"

been in China. Rittal's warehouse space in Bangalore has since grown to 4,500 square metres, and its production space to 19,200 square metres. The company has over 18 locations in India and employs 1,100 staff. There are currently 40 distribution partners. "This is a very strong factor in our success," says Bhargava.

Where Rittal really shines is in powerful solutions. A recent survey of existing and potential customers in India revealed that they valued product quality as "very good" on average. According to the conclusion of the survey, then, this is Rittal's main asset and a clear advantage over the competition. Approximately eight out of ten survey participants were fans of Rittal – but they also checked the offers of competitors at the same time. As regards the price-performance ratio and the aftersales service, Rittal performed at 7.5 out of 10 points from a customer perspective, equivalent to "good." Because these areas have a great impact on satisfaction and loyalty, however, this result is not good enough for Rittal. As Bhargava sums it up, "This is where we need to have an edge."

The clear goal to never rest on its successes has made a substantial contribution to Rittal's growth in India. An impressive majority of customers answered in the affirmative when asked whether they would recommend Rittal to others. The key indicator calculated in this way, the Net Promoter Score (NPS), is well above the international benchmark of the British market research institute YouGov, which carried out the study. As measured by the NPS, Rittal's customers in India are even more satisfied than those in other Rittal locations.

Twenty years after the founding of Rittal India, the company can look back on annual average revenue growth of 15 to 20 per cent. This is more than mere participation in the boom. Since the last survey in 2012, Rittal has improved in all areas of performance, from the processing of bids and orders to aftersales service – and that appeals to customers in India. The number of fans has risen, and the number of vacillating customers was halved. Rittal ➔

8.0

to 8.4 points out of a maximum of 10 points – likewise an excellent rating – achieved by Rittal for innovation, reliability, responsibility and solution-oriented approach.

has continued to expand its market share in the past two years as compared to its competitors.

Internationally consistent quality and customer service have played a crucial role in this. "A product that is manufactured in Bangalore is equivalent to one from a German or Chinese factory," explains Ajay Bhargava. Above all, the company stands by its 48-hour delivery guarantee to the most important regions of the country. Rittal's intelligent logistics include five proprietary distribution warehouses. The distribution partners add an additional thirty warehouses.

CUSTOMERS TRUST RITTAL

Rittal's customer base in India is made up of companies from every industry. These include Tata Motors, Magna Steyr India, Bridgestone, Festo and the Bühler Group, the Swiss specialist in milling and coating technologies. The latter company, a global family concern, has been present in India for 25 years. Its head office and production facility are located in Attibele, near Bangalore, where Rittal has its Indian head office as well. Bühler India supplies the market with its complete product and service portfolio, including technologies for feed, milling and dispersion; development engineering; project management; and automation. In 2010, Bühler India opened its ultra-modern application mill in Bangalore.

With numerous machines and an automation and control system, its services include the construction of modern product-processing plants. Bühler India relies on enclosure technology from Rittal, since Rittal enclosures are equipped for the extreme conditions that the producers in India must be prepared for: high temperatures, tropical humidity, voltage fluctuations and power outages.

For these reasons, Rittal supports planners in such activities as dimensioning the enclosure cooling capacity. The company is the first enclosure manufacturer to submit its cooling units to testing by an independent body. This lets engineers and users be sure that the climate control system works optimally, even in continual heat stress.

IN THE RIGHT PLACE

Interview. Prospering industries, ambitious government programmes, a large potential customer base in small to medium-sized enterprises: Rittal has not regretted its move into India. The subcontinent represents the centre of its commitment in Asia.

AJAY BHARGAVA
is Managing Director of Rittal India.

What does the Indian market look like for automated production?
Ajay Bhargava: Most branches of industry have not yet heard anything about automation. That is why we must make the benefits clear to customers. The greatest potential is at the base of the pyramid, not the top. International corporations already have the know-how; we want to reach the smaller Indian companies.

Which sectors are particularly interesting?
Bhargava: For example, the food and beverage industry is growing by up to 10 per cent every year. Transport and infrastructure also offer opportunities for growth because of the corresponding government programmes. We have contributed to improving infrastructure and energy supply in many projects in the field of power distribution. In IT, which is well represented in India, we're benefitting from the major trend towards cloud computing by equipping computer centres. We're acquainted with a lot of industries. When the investment starts, we'll be in the right place at the right time.

How do you acquire and retain customers?
Bhargava: Companies have to have emotional proximity to customers and not just convince them with facts. When I ask myself what my customers' problems are and can offer them good solutions, I've got a very strong hand. Customer satisfaction is a key success factor for us. At the moment we have 5,000 end-customers in the country, and there are more where those came from.

What is more, the energy efficiency of the equipment pays off – the more intense the enclosure cooling requirements, the faster they go. So it is no surprise that the most recent innovation in its cooling unit series attracted particular interest from prominent booth visitors at this year's Hannover Messe: Friedhelm Loh, Owner and Chief Executive Officer of the Friedhelm Loh Group, showed Chancellor Angela Merkel and Prime Minister Narendra Modi the Generation Blue e+ units, which use 75 per cent less energy than their predecessors, creating correspondingly lower carbon dioxide emissions. More still: the units are suitable for voltages between 110 and 480 volts and thus can be deployed anywhere in the world. "When it comes to innovative enclosure cooling, we are at the forefront worldwide," Friedhelm Loh said.
This also allows Rittal to streamline supply chains, together with its sister companies Eplan, Cideon and Kiesling. In particular, manufacturers of machines, control systems and switchgear can reduce their costs considerably through the continuous flow of data from engineering to manufacturing. In order to even better present its products and comprehensive service provisions and consulting services, last year Rittal opened its new training centre in Doddaballapur, north of Bangalore.
The objective of this facility is to build and consolidate technical knowledge, to transfer know-how and skills, and to demonstrate to customers the advantages of highly innovative solutions. It is the second training centre of its kind for Rittal worldwide. The choice of India as a location was no coincidence: as complicated and demanding as it is, Rittal considers India interface number one for the core industries in all of Asia. ■

GERHARD WULFF
Director Product
Management at Cideon.

BERND SCHEWIOR
Senior Vice President
Professional Services at Eplan.

HOUSE OF MECHATRONICS

Mechatronics. Mechanics, electronics and software are the three essential disciplines that must mesh together in a machine. An interdisciplinary approach from Eplan and Cideon supports their integration.

Text: Dr. Jörg Lantzsch

It started with the automotive industry: since 2003, automobile repair shops have offered apprenticeships in automotive mechatronics, replacing the old job profiles of auto mechanics and automotive electronics engineers. Modern automobiles are mechatronic systems, in which mechanics, electronics and software form an integrated system. As a result, major automakers now see companies like Apple and Google as their competitors.

We see similar trends in mechanical and plant engineering. Manufacturers are now seeing fewer gains in innovation in the mechanics of a machine. Significant advances are being achieved in the areas of electrical engineering, electronics, sensor technology and software. But what is the best way to design engineering in the development process of products like these? This question is now on the minds of many mechanical and plant engineers.

As late as the second half of the twentieth century, the drawing board was the tool for designers, until the first CAD systems came onto the market starting in the 1960s. They achieved a major breakthrough in the 1980s, when workplaces became much more convenient due to the pervasiveness of personal computers. Development advanced rapidly: three-dimensional design, virtual prototyping and simulations became more and more common as computers became increasingly high-performance. Today, quality CAD systems are standard in both mechanical and electrical design. "Tools like our Eplan Electric P8 for electrical design, for example, are very sophisticated and are ideal for integration," says Bernd Schewior, Senior Vice President Professional Services at Eplan.

UNSTOPPABLE DEVELOPMENT

Gerhard Wulff, Director Product Management at Cideon, has a similar view. "Our customers now enjoy substantial increases in efficiency thanks to optimised engineering processes." Because customers often have questions about how to further improve the overall engineering process, the consulting services at both companies have long played an important role. As an Autodesk Platinum Partner, Cideon has extensive expertise in mechanical CAD and PDM environments; interdivisional engineering processes and central data management are major factors. The company is also developing state-of-the-art CAD system interfaces to SAP PLM, linking engineering processes to logistics processes. However, the structuring of engineering processes in the individual disciplines is not yet adequate for a mechatronic engineering process. Processes in the various disciplines must be consolidated in order to realise further increases in efficiency. In the past there has been a lack of sufficient communication between mechanical and electrical engineers, for example. They also view machines differently: whereas mechanical engineers think in terms of spatially connected modules, electrical engineers see a machine's functions, which also involve the interaction of spatially separated parts of the machine. Coordinating the three disciplines is often complicated because the designers speak a "different language." Until now, this problem has been circumvented by staggering the work of the various disciplines, i.e. the mechanics of a machine are designed before the electronics. However, the more complex the machine, the less efficient this procedure will be. This method also impedes change management, in which different versions of the same machine are managed.

AN INTEGRATED APPROACH TO CONSULTING

Eplan and Cideon have set themselves the goal of helping customers find solutions to any type of mechatronic engineering problem. Together, the two companies have extensive expertise in electrical CAD, mechanical CAD, software and their ➔

“Our customers enjoy substantial increases in efficiency thanks to optimised engineering processes.”

Bernd Schewior, Senior Vice President Professional Services at Eplan

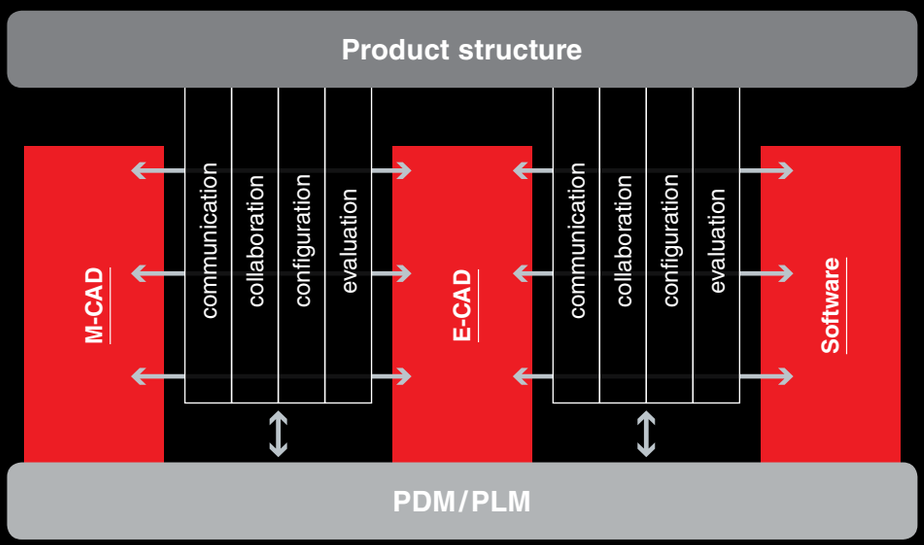
processes. “We are also aware that software development will be more important than mechanics and electronics in a future mechatronic context,” Wulff explains. “We have gathered extensive expertise and will strengthen our position in this area.” This is the foundation of what experts at Eplan and Cideon call “The House of Mechatronics” – an integrated portfolio of solutions providing support to customers during the implementation of mechatronic engineering processes. The aim is to implement mechatronic engineering, in which the various disciplines are integrated, cooperate and speak a common language. To this end, they must find a shared way of looking at the machine to be designed, i.e. a mechatronic structuring of design data. The resulting structure can then be used to create the mechatronic parts list necessary to ensure a clean reuse of mechatronic component parts. Reuse of machine parts in future projects and change and release process mapping are just two of the many benefits that mechatronic engineering can provide. Ultimately, the goal is to minimise coordination and administration overhead in the engineering process. “Many designers now spend a large part of their workday coordinating with each other,” says Wulff. “For some, 30 to 40 per cent of engineering tasks are administrative.” Interfaces between the various processes are a major issue; this is an area where Cideon can contribute its expertise.

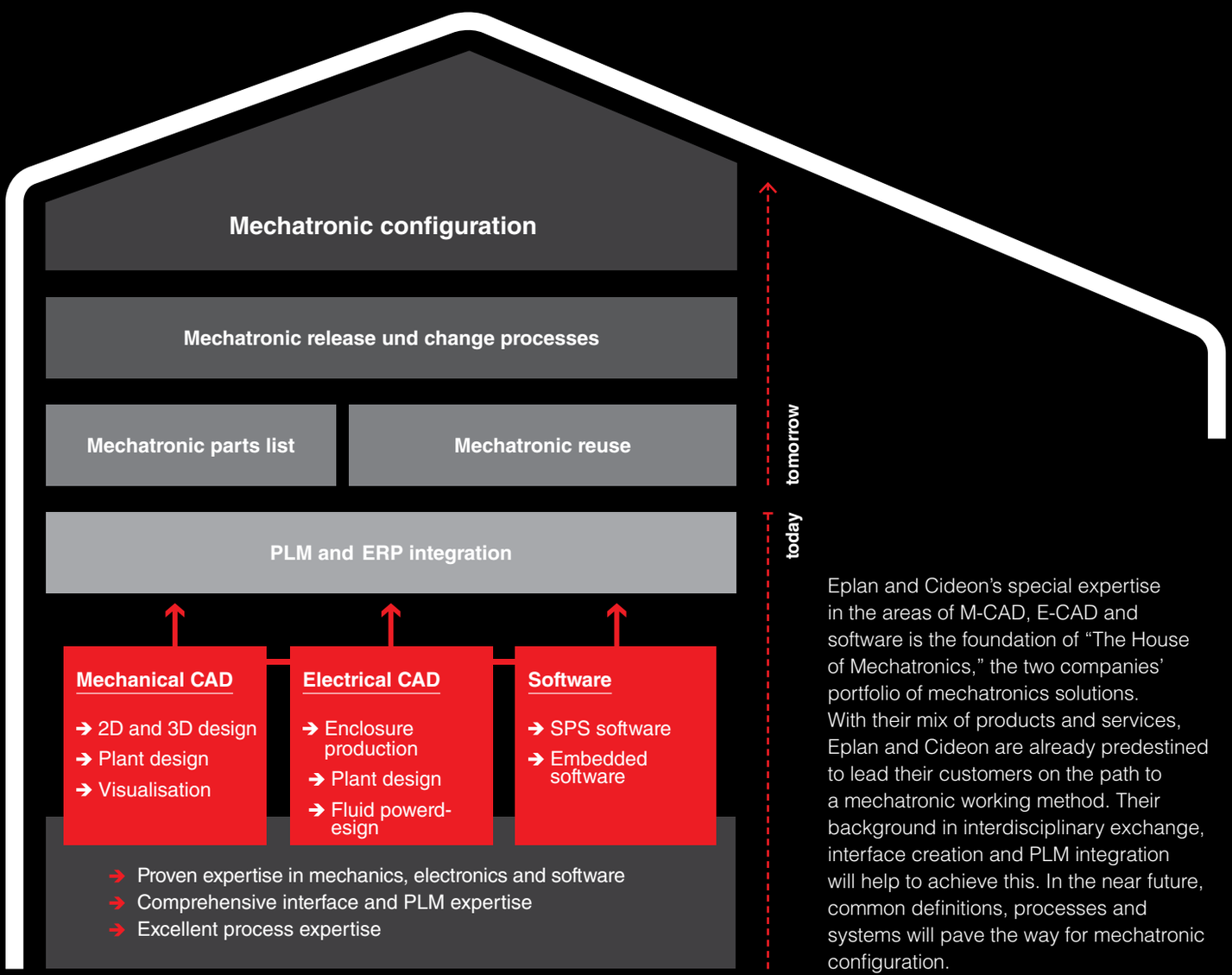
The collaboration between Cideon and Eplan is working very well. “Our customers can contact us for competent support in all aspects of mechatronic engineering,” Schewior says with conviction. Both companies possess sound expertise in mechatronic processes, which will be further developed. In interdisciplinary teams, employees from both companies have already demonstrated their expertise in customer workshops. The market for mechatronic engineering will experience dynamic growth in the coming years, especially in mechanical and plant engineering, promising an exciting future for the two companies. Integrated support of the mechatronic engineering process will be key. ■

→ LINK TIP:
Scan this QR code for more information about mechatronics solutions.

MERGING DISCIPLINES

Mechatronic engineering makes communication, cooperation, configuration and analysis possible on the basis of and alongside a mechatronic product structure independent of discipline. The use of an integrated PDM system is a prerequisite for mechatronic engineering.





Eplan and Cideon's special expertise in the areas of M-CAD, E-CAD and software is the foundation of "The House of Mechatronics," the two companies' portfolio of mechatronics solutions. With their mix of products and services, Eplan and Cideon are already predestined to lead their customers on the path to a mechatronic working method. Their background in interdisciplinary exchange, interface creation and PLM integration will help to achieve this. In the near future, common definitions, processes and systems will pave the way for mechatronic configuration.

STRONGER TOGETHER

Energy supply. General Electric and the Friedhelm Loh Group have been close collaborators for nearly two decades in many areas of business. Results of this successful partnership can be found around the world, as examples from Switzerland and Berlin show.

Text: Susanne Theisen

Nant de Drance, the pumped-storage power plant in the Swiss Alps, is a gigantic construction site. The power plant, for which a 17-kilometre tunnel was dug in the mountains, will have a turbine capacity of 900 megawatts – approximately equivalent to the electricity consumption of 625,000 households. Beginning in 2018, the pumped-storage power plant is expected to produce around 2.5 billion kilowatt-hours of electricity a year. For this building site of the century, Rittal is providing approximately two hundred enclosures from the TS 8 series with climate control components. This is where the converter technology of General Electric (GE) will be situated. The first enclosures have already been installed on site.

Nant de Drance is just one of many GE projects for which Rittal is a supplier. The business relationship began in 1992 in Germany, at that time with AEG. Following several acquisitions and name changes – including by the Cegelec Industrial Group, which transitioned into the Alstom corporation – the company has operated under the name of GE Power Conversion since January 2012. Despite the many transitions, the business relationship with Rittal was never interrupted. Quite the contrary: it was gradually expanded over the years to other countries such as China, France, the United Kingdom and Brazil. Today it comprises many different industries and areas of work, including the photovoltaics sector, in addition to GE Power Conversion. ➔

AT A GLANCE
Gerhard Edinger, Managing Director Power Conversion and European Site Leader at General Electric, and Jörg Maschuw, Director Key Account Management Renewable Energies at Rittal, during a tour of the production in Berlin.

“Our partners at Rittal stand out in that they not only refer to the catalogue, but also respond flexibly to customer requirements.”

Gerhard Edinger, Managing Director Power Conversion and European Site Leader at General Electric

CLOSE COORDINATION
Gerhard Edinger and Jörg Maschuw are responsible for a team of specialists on both sides who ensure the worldwide rollout of the products and its innovative realisation.

It is characteristic of the collaboration between the two companies that either Rittal or GE was already represented in each respective region to which one group drew the other. This presence, along with a frequent geographic proximity to the international locations, has intensified the partnership. Another contributing factor is that GE not only makes use of the expertise of the Friedhelm Loh Group through Rittal, but is also one of Eplan’s top customers in the world.

The cooperation between GE and the Friedhelm Loh Group includes many areas of business and has one key feature: new product models are developed jointly by the two companies in Germany and then rolled out worldwide. This requires close collaboration between employees at all levels, in both engineering and procurement as well as in production and logistics. The staff members include Jörg Maschuw, Director Key Account Management Renewable Energies at Rittal, and Gerhard Edinger, Managing Director Power Conversion and European Site Leader at GE.

Maschuw has handled the GE account for over fifteen years. He knows that “GE expects excellence from its suppliers – sometimes even more than that.” Gerhard Edinger confirms this: “We do demand a lot from our partner companies. This especially includes the willingness to sometimes pursue paths that lie outside the ordinary. Our partners at Rittal stand out in that they not only refer to the catalogue, but also respond flexibly to customer requirements.” Edinger notes that this was the case years ago in the industrial solutions sector, and now is again apparent in the field of power conversion.

Against the background of many years of cooperation, it is not surprising that Rittal products can also be found in the GE training centre for converter technology recently opened in Berlin. The heart of the Learning Centre is the laboratory. “We set up our product exhibits here, for employees and customers to receive technical training on them,” explains Thorsten Helmert, project manager for the Global Technical Learning Centre, during a tour with Gerhard Edinger and Jörg Maschuw.

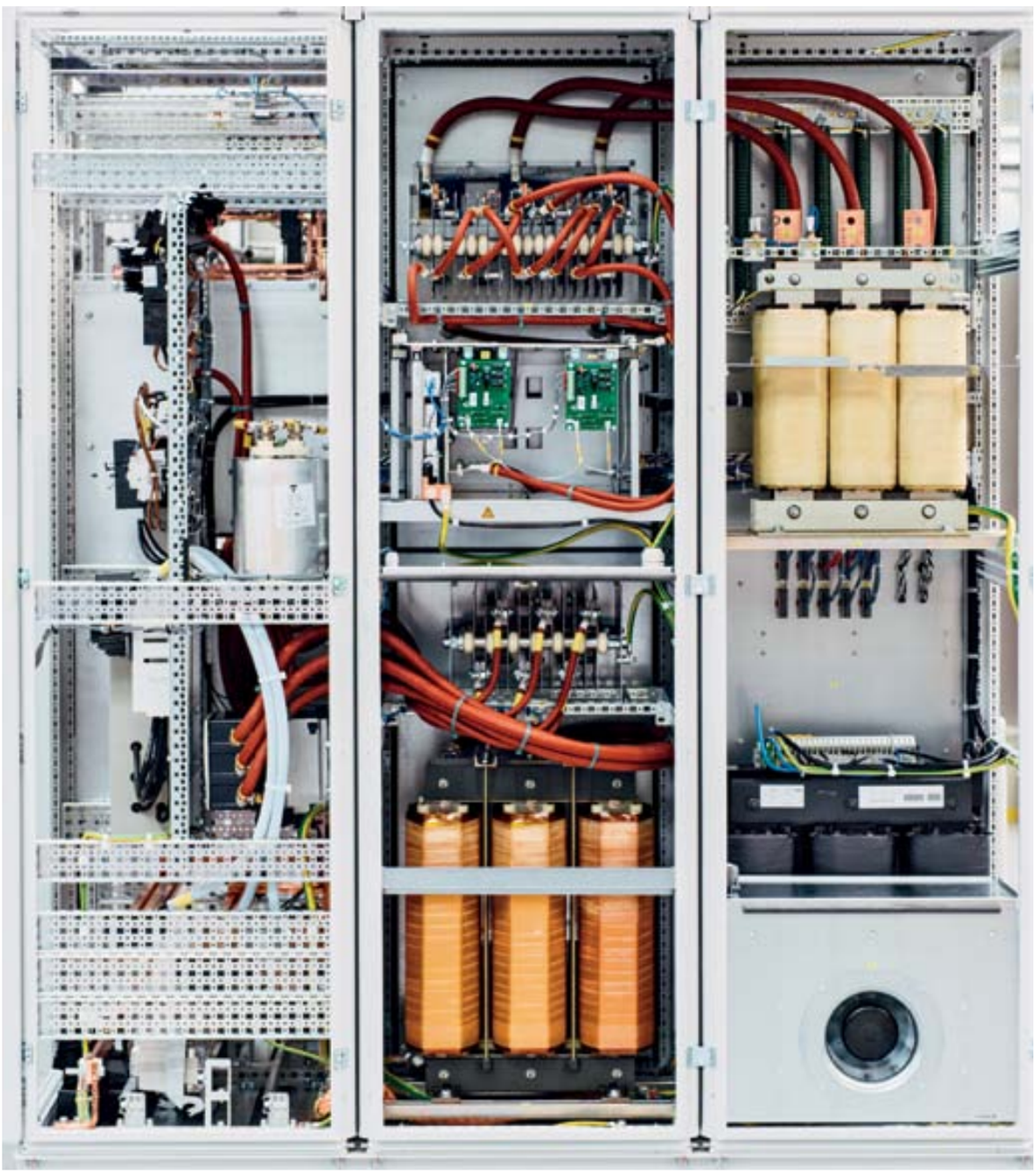
SETTING STANDARDS TOGETHER

The medium-voltage systems built in the laboratory are housed in the control enclosures from Rittal. GE is pursuing a clear vision through its new training centre: it should serve as a platform for discussing ideas and innovations. This includes Berlin’s universities and active start-up scene. In particular, GE is inviting its customers and partner companies to participate in this exchange – among them the Friedhelm Loh Group. The numerous standards that the two groups have jointly set testify to how efficient the collaboration already is.

For example, Rittal brings many valuable standards to the product portfolio of GE that are essential in international business, such as IP protection classes, NEMA approval and UL certifications. Product lines have emerged that take these standards into account and represent a customer series for Rittal in the wind and photovoltaics ➔

PRODUCTION IN THE CAPITAL
The products General Electric makes in Berlin include converter lines for photovoltaic projects worldwide.

SOLAR CONVERTERS
Technology at its best: Rittal TS 8 enclosure technology installed with converters from the LV5 series.



"Berlin is one of the most important economic centres in Europe, and the location right next to our factory is ideal for practical and experiential learning approaches."

Thorsten Helmert, project manager for GE's Global Technical Learning Centre

PROJECTS

GE AND RITTAL IN ACTION

1,000

enclosure combinations from the TS 8 line were delivered by Rittal for an order that will be concluded with GE in December 2015 in the ProWind Frequency Converter segment. The GE ProWind Converter has a distinctive modular, compact design and high power.

3,000

enclosure combinations from the TS 8 line will be delivered by Rittal by 2017 for GE's ProSolar Converter (LV5 Solar). The enclosures are liquid- and air-cooled and can withstand temperatures from -25 degrees Celsius to +55 degrees Celsius. Temporary disruptions in the supply network will not interrupt their operation.

sectors. "In the area of the company's MV 7000 converter, we are currently working further on standardised individual enclosures. The findings from the configuration of the enclosures are also a perennial incentive for both sides to bring future standards to the market," says Maschuw, with Edinger's assent.

The impressiveness of their common track record is due among other things to the fact that GE integrated the Friedhelm Loh Group, and especially Rittal, into the project at an early stage. Gerhard Edinger justifies this commitment to early involvement thusly: "The market trend in the segments we're working in calls for a dramatic optimisation of delivery times." Edinger cites an example from the field of renewable energies: "It used to take twelve weeks for an inverter to get to the customer, from the order to the delivery. Today we're at eight weeks, and there are requests to get down to four weeks. To do that, we need to integrate our main suppliers into the planning process early, or else we are not in a position to be able to jointly meet these challenges."

ONE HUNDRED PER CENT DELIVERED

In order to assert itself on the market, a company also needs smooth logistics. For a major order in the field of renewable energy in the United States, Rittal and GE have currently agreed on a logistics concept that is based in part on exact forecasting programmes with precise delivery dates and quantities, as well as optimised coordination between procurement and project management.

Jörg Maschuw is very satisfied with Rittal's performance on this major contract: "We met one hundred per cent of GE's expectations by going from prototyping to mass production within a very brief time. We needed only three weeks." Despite this achievement, those at Rittal know that they may not always be GE's set supplier. "We also have to face up to the market and the market price," Maschuw admits. "There is plenty of pressure at this juncture."

But Edinger's conclusion about the collaboration with this Herborn-based company shows that Rittal can enter into the race with the utmost confidence: "Our success shows that this partnership works." ■

EXPERIENCING INNOVATION FIRST-HAND

HOST
Jeff Immelt, CEO and Chairman of the Board of General Electric, opened the new training centre in Berlin.

After two years of construction, GE's Global Technical Learning Centre opened its doors on 25 September at the site of GE Power Conversion in Berlin-Marienfelde. The training centre has a total area of 2,500 square metres, as well as space for both internal GE training and external technical training for other companies. The building has 15 conference rooms and a 1,100-square-metre exhibition space that accommodates up to eight hundred people. GE deliberately sought to locate the training facility close to its Berlin Power Conversion site, the company's largest production facility in Germany. This puts participants in first-hand contact with innovations and lets them dialogue with experts from GE."Here we have combined the best aspects of our services and infrastructure," said Francesco Falco, Global Sales Leader of GE Power Conversion, in his speech for the opening. "With its modern technical equipment and individual offers and services, our training centre represents a comprehensive solution for customers to hold trainings in a productive learning environment."

Thorsten Helmert, Lean Leader at GE Power Conversion and Project Manager for the Learning Centre, added, "Berlin is one of the most important economic centres in Europe, and the location right next to our factory is ideal for practical and experiential learning approaches. Our goal for our customers and employees is to create the best possible training facilities, an integrated environment and space for innovation."
The Berlin Senate has sponsored the centre with 1.3 million euros. "I am pleased with the decision by GE to further strengthen the importance of Berlin as a prime business location in Germany with its opening of the Global Technical Learning Centre," said Cornelia Yzer, Senator for Economics, Technology and Research. "We look forward to welcoming the company's technology experts to the German capital."

SHOWROOM
Inside the Global Technical Learning Centre, participants receive a graphic look into the practice of engineering in enclosures from Rittal.

PILOT RUN
Fifty Blue e+ cooling units comprise the first production series in Vallegio sul Mincio.

START OF PRODUZIONE

THE FIRST BLUE E+ COOLING UNIT LEAVES THE FACTORY IN ITALY

"World's First," the slogan of the marketing campaign for the new generation of Blue e+ cooling units from Rittal, is a matter of policy in Valeggio sul Mincio in Italy. The first cooling unit from the new Blue e+ series was completed in August. The pilot run includes about fifty cooling units, which Rittal needs in order to perform final tests and equip its showrooms across the globe. Rittal is utilising a standardised modular kit for production and as a consequence is making its manufacturing processes considerably more flexible. Integrated digital networking within assembly in accordance with Industry 4.0 safeguards processes and quality while also making batch size 1 manufacturing possible. Series production of the units has started in the meantime.

NEXT STEP FOR LKH

INVESTMENT IN THE LATEST TECHNOLOGY

Under the motto "Next Step for LKH," the plastics experts at the Friedhelm Loh Group are making inroads into a new production dimension. Along with a new laser sintering system, LKH also invested last year in an injection moulding system with a clamping force of 1,600 tonnes. "This allows us to produce the complete base tray of the Blue e+ cooling units in one piece," reports Rüdiger Braun, Director Sales and Engineering at LKH. The objective of the large-scale investment initiative is to further enhance existing expertise and satisfy the increased customer requirements in the long term.

100

CUSTOMERS IMPRESSED BY EXPERTISE

CUSTOMER VISITS IN GERA

"Our expertise – Your benefit." Rittal redeems this promise anew every day, as witnessed by some one hundred customers in late June at the distribution and logistics centre in Gera. The expert lectures focused on the new Blue e+ generation of cooling units.

SMART STRATEGY

RITTAL COLLABORATES WITH HP

Rittal and HP Data Center Facilities are world leaders in the IT business. The companies are now continuing to expand their collaboration in France: "Rittal and HP Data Center Facilities have signed a joint partnership agreement," says Dominique Manet, Managing Director at Rittal France. The agreement will link the product, systems and solution expertise from Rittal with the expertise of HP as a general contractor in the planning and construction of turnkey computer centres.

STRONG PARTNERS
Representatives from Rittal and HP Data Center Facilities have forged a strategic partnership in France.

GROWN ENORMOUSLY

NINE NEW ADDITIONS TO THE WEB-BASED EPLAN DATA PORTAL

Thousands of updated parts data entries and nine new manufacturers – this is the current state of the Eplan Data Portal. As of September, Eplan's Web-based electronic product catalogue now offers more than 70,000 international users access to over 582,000 parts data entries from 100 manufacturers. In addition to Siemens, Vega and General Electric, the current version of the digital product catalogue also includes manufacturers such as Lumberg, Mencom and Hirschmann. With around 2,600 new or revised records for series and assembly parts from Rittal, designers in electrical engineering are now getting improved assistance when planning enclosure, climate control and power distribution equipment. In addition to commercial information, the records also contain 2D and 3D graphics macros, wiring plan macros and manufacturing information. The integrated 3D viewer allows all items to be quickly evaluated.

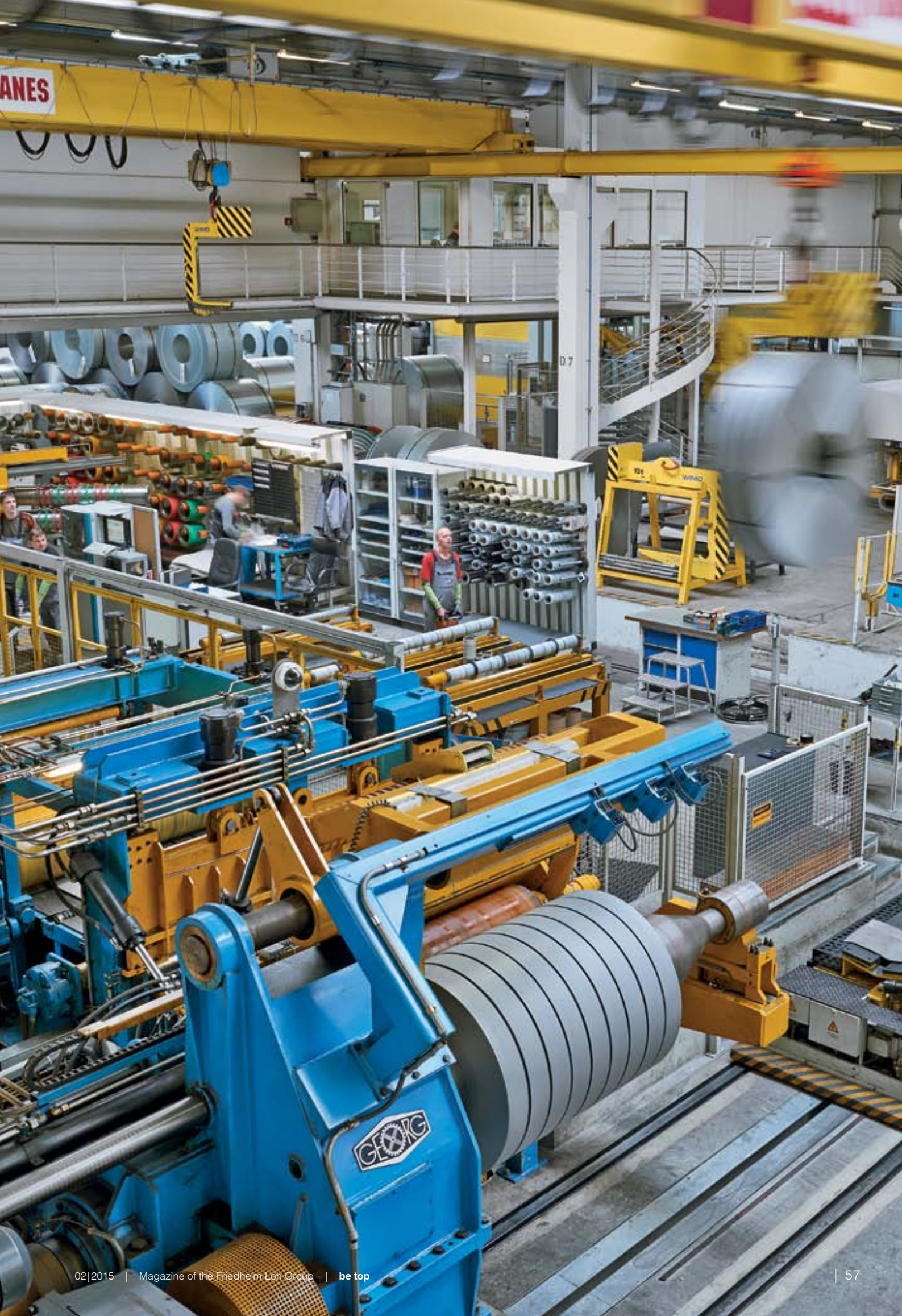
→ LINK TIP:
Scan this QR code for more information on the expanded Eplan Data Portal.

FOCUSED ON THE MARKET
Stahlo Managing Director Guido Spenrath sees his company not only as a provider of slit steel strips and sheet, but as a partner and solution provider that works independently of steel plants.

STEEL OF THE FUTURE

Steel. Harder, lighter, cheaper – the requirements for the steel industry are changing profoundly. With pioneering technologies, modern plants and extensive expertise, Stahlo has been quick to respond to developments. The company is now building a new steel service centre in the Greater Gera region.

Text: Rebecca Lorenz


ANES
GEORG

HIGH-STRENGTH STEEL
The modern slitting line in Gera slits steel with a tensile strength of up to 1,400 newtons per millimetre.

It's hard to find a product that doesn't contain steel, whether it is automobiles, refrigerators or desk drawers," says Guido Spenrath, Managing Director of Stahlo, with satisfaction. "Although the market has been exploring the use of alternative materials for years, it's impossible to imagine a world without steel." Over the last 2,500 years, no material – not aluminium, carbon fibre or ceramic – has been able to stop the advance of the strong iron alloy. Still, over the last few decades, the steel sector has changed more profoundly than nearly any other traditional industry.

In the last 25 years, modern plants, environmentally friendly technologies and new steel grades have transformed the metal into one of the most important drivers of growth, innovation and climate protection. "Most people think the steel industry is still technologically backwards," says Spenrath. "But the exact opposite is true. Germany's clean energy revolution would be impossible without steel, and the metal's CO_2 balance is nearly unmatched by other materials." Eighty-two per cent of modern wind turbines, which are a central pillar of the clean energy revolution, are made from steel. In addition, the material is easily recyclable. This is why steel products save six times more CO_2 in the course of their lifespan than is released during their production.

"Around 35 per cent of total industrial value added in Germany is still based on steel," says Spenrath. "One reason is that there have been enormous advances in our industry in recent years, in both technological development and knowledge acquisition." One example is the development of ultra-high-strength steel, which plays a central role in lightweight construction processes in the automotive and other industries. "With ultra-high-strength steel we can reduce the thickness of steel strips without affecting their stability," explains Spenrath. "In this way, we can also reduce the weight and the CO_2 emissions of cars without jeopardising their crash safety."

PIONEERING TECHNOLOGIES

More than 400,000 tonnes of processed steel leave Stahlo's production sites in Gera and Dillenburg each year, and around 20 per cent of this output has a tensile strength of more than 1,100 newtons per square millimetre. In addition to slitted coils, the company produces contoured blanks, trapezoids, cut-to-size sheets, standard sheets and curved cuts for a variety of industries, including automakers, enclosure producers, manufacturers of plumbing supplies, furniture makers and extrusion technology companies. "Ten years ago we invested in advanced slitting and blanking technology so that we could deliver products of the highest quality," says Spenrath. "The lines at our Gera site were so pioneering at the time that they are only now being recognised as a technological standard." Due primarily to this large head start, Stahlo has been able to gain an important advantage as regards knowledge in the highly competitive steel market, even in the field of high-strength steel.

To ensure that it maintains this advantage in the future, despite overcapacity and price pressures on the market, Stahlo is planning to build a new steel service centre in Greater Gera. "At our new location we want to invest not in common products, but exclusively in plant technology that is promising for the future – just like we did ten years ago in Gera," says Spenrath. ➔

SLITTING LINE

TECHNOLOGY WITH A FUTURE

Ten years ago, at its slitting line in Gera, Stahlo invested not in a common product, but exclusively in technologies with excellent future prospects. As a result, the line, which is used to process steel coils up to two metres wide, has today established itself as a technological standard.

Depending on the customer request and the order, the slitting line processes different slit strip dimensions and preliminary materials. For example, the modern equipment can slit steel with a tensile strength of up to 1,400 newtons or a thickness of four millimetres. In addition to hot and cold rolled steel, it processes galvanised and pre-painted sheet, stainless steel and the composite Bondal. Up to 150,000 tonnes of processed steel leave the production facility in Gera each year.

MEETING INDIVIDUAL REQUESTS
Dimensions, weights and preliminary materials vary depending on customer and order.

STEEL ON THE LINE
The slitting and blanking lines at Stahlo's Gera site process steel coils of up to two metres wide.

OF THE HIGHEST QUALITY
Workers regularly check the thickness and surface finish of the processed steel for quality.

"Our goal is to process steel grades with a tensile strength of more than 1,800 newtons per square millimetre within the next two years. So far there is only a single European steel plant that can produce steel of this quality."

INVESTING IN THE FUTURE

However, in the future, the company wants to invest not only in production but also in technical consulting. "For me, Stahlo is not just a service provider, but also a partner for our customers and suppliers," says Spenrath. "That's why our staff are always available to them with their expertise for all questions revolving around technical applications. It doesn't matter to us whether someone is already a customer or approaching us for the first time." Because Stahlo's consultants work independently of steel mills, they can objectively assess problems associated with applications, products and logistics, and come up with individually tailored solutions.

"Our focus is on the customer in everything we do," says Spenrath. This is one reason Stahlo intently studied the current market situation when designing its new centre. "We wanted to answer a variety of questions. How is the market evolving? What do the different market sectors focus on? We also wanted to determine the areas in which steel is slowly but surely being replaced by alternative products," explains Spenrath. "On the basis of a customer survey, we then decided to expand our product range to include aluminium when building the new centre."

In the past few years Stahlo has gained initial experience with this alternative material. "We've repeatedly been asked to slit aluminium for our customers, in addition to steel," says Spenrath. "So we definitely have the necessary know-how." When the new centre is built, Stahlo will retool its new contoured blank cutting line for aluminium processing so that it will be able to both slit and cut aluminium coils.

In addition to Rittal, a large number of international automotive and OEM producers will benefit from Stahlo's expanded product range. "Our company was founded in 1983 as a supplier to Rittal, but our external business has grown enormously in Germany and abroad," says Spenrath. "We used to generate 100 per cent of all sales with our affiliate, but now it is less than one quarter." This share will continue to decline relative to total sales in future. "Our goal is to expand our external business. After all, it gives us the opportunity to take up new challenges and constantly evolve." ■

➔ LINK TIP:
For further information, please scan this QR code or visit www.stahlo.de.

FACTS, FIGURES, DATA

STEEL IN NUMBERS

With around 3.5 million employees and an annual output of 45 million tonnes of raw steel, the German steel industry makes an important contribution to industrial value added in Germany. The traditional material plays a key role in many industries – from car manufacturing and power generation to engineering – and is a major driver of growth, innovation and climate protection.

6.5

jobs in the overall economy are secured by one job in the steel industry.

20

per cent of the engineering industry's purchases of intermediate inputs comes from the steel and metalworking sectors.

46

per cent of every German steel product consists on average of recycled material.

A STRONG PARTNER

Interview. Guido Spenrath, Managing Director at Stahlo, discusses current developments on the steel market and his company's plans for the future.

What is the situation on the steel market today?
Guido Spenrath: We're struggling with overcapacity. That's why we're not investing in common products, but exclusively in technologies with a promising future. Starting in 2017, we will be able to use our slitting line to cut 61 strips of steel simultaneously with a tensile strength of up to 1,800 newtons or a thickness of five millimetres. Even if we do not foresee that steel will be replaced by an alternative material in the future, we discussed the processing of aluminium and other metal materials when designing the new centre.

What requirements will steel service centres need to fulfil in the future?
Spenrath: I no longer see steel service centres as pure-play suppliers of steel, slit strips and sheet. Rather, they are increasingly evolving into solution providers that offer answers to all questions revolving around products, problems and logistics. Because our steel service centres work independently of steelworks, our staff can evaluate problems objectively and support customers as partners.

Can you imagine investing abroad?
Spenrath: We will certainly be dealing with this topic in the future, especially since, with Rittal, we have one large purchaser of steel operating abroad. Several other customers have also asked us to support them outside Germany. They want to ensure that their high quality standards are also met there – the promise of "Made in Germany." We're currently filling orders from foreign countries with the help of individual logistics solutions.

CLEAR CONTOURS
With a nominal force of around 1,000 tonnes, Stahlo's contoured blank cutting line incorporates state-of-the-art technology.

ADVANCES IN LIGHTWEIGHT CONSTRUCTION

Research. Cooperation with development partners from industry and academia is a targeted strategy for plastics specialist LKH. The objective is to achieve shorter product development cycles and a faster time to market. The best example is the ongoing cooperation with the Chemnitz University of Applied Sciences on the development of lightweight technologies.

Text: Rachel Wolpert

Lightweight construction is a key technology of the future. Wherever masses have to be moved, weight optimisation plays a role in the conservation of raw materials and energy. The resource-efficient production of lightweight structures with high performance and functional density is one of the objectives of Rittal and plastics specialist LKH's cooperation with the Chemnitz University of Applied Sciences (TU Chemnitz). In June 2014, an agreement was signed facilitating the establishment of the System Technology and Switch Module Endowment Professorship at TU Chemnitz. The cooperation partners intend to explore the use in enclosure manufacturing of new materials and lightweight construction technologies made of fibre composites, to develop machinery and production resources for enclosure construction and to build automated value chains.

TU Chemnitz can draw on a research project in the field of production technologies that is unique in Europe – and likely in the entire world: "MERGE – Fusion technology for multifunctional lightweight structures." Since 2012, this project has been a Federal Cluster of Excellence. "With the exploration and development of these processes, TU Chemnitz is conducting base-level research. There are potential uses for high-volume applications in particular," explains Professor Dr.-Ing. Wolfgang Nendel, director of the System Technology and Switch Module Endowment Professorship. Within the cluster, his group, which also includes degreed engineers Mirko Spieler (automation technology) and Norbert Schramm (plastics technology), is developing new production techniques and equipment, such as a continuous winding process for manufacturing rotationally asymmetric components.

On the basis of interdisciplinary research, new material systems are to be created that can be used in hybrid structures, e.g. metal-plastic composite components. This is of particular interest to the automotive industry. Starting in 2020, new European Union directives on CO_2 emissions will be in effect: new vehicles will be allowed to emit only 95 grams per kilometre. However, MERGE is interesting not only for automakers. LKH and its sister company Rittal also see openings for specific material and product development in the plastics sector. One example of this kind of shared product development: high-volume plastic components made of semi-crystalline thermoplastics moulded in structural foam, which LKH is developing in cooperation with TU Chemnitz. "We consider a strong network with strategic development partners like TU Chemnitz the key to successful products," says Rüdiger Braun, Director Sales and Engineering at LKH.

A core development target is resource-efficient, low-material component manufacturing, achieved by means of thermoplastic foam injection moulding (TFIM). With this method, additional gas is introduced into the mould. "The resulting air chambers are responsible for material savings of 10 to 20 per cent in the manufacturing of plastic structural components," says Dipl.-Ing. Norbert Schramm. Another research goal is distortion reduction, because the dimensions of large-scale components cause excessive distortion during traditional injection moulding.

STREAKS REMAIN TROUBLESOME

The scientists at TU Chemnitz are particularly dedicated to pursuing a further research and development objective: improving the look of thermoplastic foam component surfaces. Although TFIM is resource-efficient and leads to less distortion, the process still results in the formation of so-called silver streaks on the surface of components. These arise when air chambers rupture and stretch along the ➔

THE EXPERTS AT TU CHEMNITZ

Professor Dr.-Ing. Wolfgang Nendel (centre), director of the System Technology and Switch Module Endowment Professorship, as well as degreed engineers Mirko Spieler (automation technology, left) and Norbert Schramm (plastics technology), are researching fusion technology for multifunctional lightweight structures.

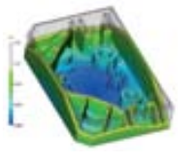
surface during the production process. The scientists want to solve this problem by using materials specially developed for the TFIM process, as well as innovative temperature control concepts for heating and cooling the injection mould.

A technology demonstrator jointly defined with Rittal and LKH is being used to analyse various materials and temperature control concepts and evaluate their potential for cost-effective mass production. The topic of simulation plays an essential role, because a transfer to other components is only possible if a proper representation of the mould-filling characteristics in the TFIM process has been achieved. To this end, new material models are also being developed in Chemnitz, which are transferred to the simulation software in order to better describe the manufacturing process at the computer. Moreover, the stresses to which the product is exposed while in use (e.g. static or dynamic load conditions during transportation by truck) can be simulated in the same way as the mould-filling characteristics. The aim of the technology demonstrator tests is to develop design guidelines and simulation technology for components and the corresponding injection moulds for the TFIM process. These can be quickly transferred to larger components, thus accelerating the development time of new products.

But how exactly does a collaboration of this kind function? For example, if LKH needs a new or refurbished component or preliminary testing tool, the company turns to TU Chemnitz to develop the process technology. The first step for the scientists is determining load requirements and appropriate dimensioning and design for the component. In this way, the structure, number of fins and wall thickness of the component are already partially defined. Based on this predetermined geometry, a tool is now developed and a negative component is produced – a cavity with injection points, which is filled with polymer melt. Finally, the cooling process yields the finished component. Additionally, depending on the application desired, load-bearing reinforcement structures can be selectively installed in the component. That is precisely what is developed in MERGE: continuous fibreglass-

ENDOWMENT PROFESSORSHIP

JOINT PROJECTS



SIMULATION
R&D analysis of the TFIM process on the mould-filling characteristics of the technology demonstrator.

MOULD DESIGN AND MANUFACTURE
Test mould for the TFIM process.

PROTOTYPE PRODUCTION
Technology demonstrator for experimental tests.

MERGE
The injection moulding spin platen machine with a clamping force of 2,500 tonnes enables processing of innovative material systems.

"We consider a strong network with strategic development partners like TU Chemnitz the key to successful products."

Rüdiger Braun, Director Sales and Engineering at LKH

reinforced thermoplastic semi-finished products – so-called thermoplastic prepegs – which can be used to reinforce this kind of component. Their fibre architecture can be designed to ensure that the fibres have a load-conforming alignment, i.e. always in the direction of the power flow.

TRANSITION TO PRODUCTION STAGE

At TU Chemnitz, the machinability of from 500 to 1,000 items is first checked on a small machine. The scientists conduct tests and set material parameters in order to determine the scientific basis for materials and manufacturing processes. The second step of this research involves the use of a injection moulding spin platen machine with a clamping force of 2,500 tonnes, which was developed in the MERGE cluster. In order to achieve the long-term goal of mass production, the results of this research must have large-scale application. One advantage: thanks to the one-to-one mapping of the planned component, values such as load distribution can also be accurately predicted. LKH can then transition these high-volume components to the production stage at its plant.

LKH EXPERT DAY

LKH has also had its eye on bioplastics for use in the electrical industry for some time, but always faced the problem in electronics of having to take current protection into account. Bioplastic components must meet LKH's special requirements: they must demonstrate high dielectric strength and may not be flammable. Thus far, the bioplastics have failed to meet these requirements. TU Chemnitz experts in the fields of biopolymers and natural fibre composites have conducted research on this in cooperation with the established Endowment Professorship. On the first LKH Expert Day on 10 September, development trends and potential uses for bioplastics in electronics applications were presented at LKH headquarters in Heiligenroth near Montabaur (Germany). Polylactates, or polylactic acids, are particularly well suited for foil production because they are low-cost and easy to process. Bio-PET (polyethylene terephthalate resin from bio-sourced ethylene glycol) is already in high-volume use, particularly by the Coca-Cola beverage company.

Of course, while LKH and Rittal may approach TU Chemnitz with specific requests, TU Chemnitz is also conducting its own research into new trends and supports its partners in their new developments. For LKH and its partners, the development of technologies and technological processes for the future is a joint task. ■

INTERNATIONAL HUB
Each year, nearly 40 million passengers use Munich's Franz Josef Strauss Airport. The airport is responding to the growing numbers with a new satellite building – and technology from Rittal.

READY FOR TAKE-OFF

Munich Airport. With passenger volume constantly on the rise, a reliable energy supply for the countless displays, luggage carousels and counters is increasingly important. For more than fifteen years, airport operations have relied on technology from Rittal.

Text: Dr. Jörg Lantzsch

MUNICH AIRPORT

THE BIG MUC

With almost 40 million passengers, 300,000 tonnes of cargo and more than 376,000 take-offs and landings, Franz Josef Strauss Airport in Munich (MUC) is a major aviation hub. In an international comparison, the airport is ranked seventh in passenger volume in Europe and thirtieth worldwide. Since commencing operation in 1992, it has more than tripled its number of passengers. Approximately 30,000 people are employed at the airport – nearly 8,000 of them by the Flughafen München GmbH itself. The airport uses combined heat and power plants to meet more than half of its electricity needs. In addition to electrical power, district heating and cooling for all buildings at the airport is provided centrally.

Munich's Franz Josef Strauss Airport is reaching its limits. Overall last year, it recorded just over 376,000 take-offs and landings and approximately 39 million passengers. The capacity limit for Terminal 2, originally built for 25 million passengers a year, was exceeded in 2013 with 27.5 million passengers. The new satellite building under construction to the east of Terminal 2 should provide some relief. With an additional passenger volume of 11 million per year and 27 aircraft parking positions near the building, the situation should ease up significantly by the start of the 2016 summer timetable. "Satellite" means that passengers will have no direct access to the structure from outside. An underground passenger transport system will bring passengers from Terminal 2 to the satellite and vice versa in just under a minute.

Power Plant West supplies the airport with heat, electricity and cooling. It houses power supplies from the utility company's medium-voltage level, a combined heat and power (CHP) plant and refrigeration units. District heating and cooling water systems provide heat or cooling to loads in the individual buildings.

MODERNISED INFRASTRUCTURE

The expansion of Terminal 2 has a direct impact on the technical infrastructure of the airport. For example, it will not be possible to transport refrigeration and cooling water from the old power plant on the west side of the airport all the way to the new satellite structure on the east side. "We would have had to increase the pressure too much to cool the remote satellite structure at Terminal 2," explains Peter Schembera, whose responsibilities include refrigeration and coolant distribution. Therefore, parallel to the terminal expansion, the Flughafen München GmbH (FMG) group has created Power Plant East to adapt the technical infrastructure to the new requirements. A new power plant replaces a refrigeration unit that has stood in a makeshift hall for about ten years, providing cooling capacity to Terminal 2. The CHP plant in Power Plant West, which covers about 60 per cent of airport electricity needs and produces district heating for space heating, has also been modernised. Since completion, the two power plants are able to provide the airport with an ample supply of heat and cold and a large part of its electricity.

POWER FOR REFRIGERATION UNITS

The new Power Plant East was built by Karl Lausser GmbH as technology general contractor on behalf of FMG. In addition to a new medium-voltage power supply, it has room for four turbo refrigeration units, each of which can provide a cooling capacity of up to 5.5 megawatts. In the very hot summer of 2015, the necessary cooling capacity in the airport structures was sometimes more than 15 megawatts. The turbo refrigeration units work with large compressor cooling units and pass the cold produced on to a cooling water cycle, which accommodates the air conditioning. The return flow temperature of the cooling water is 15°C; the refrigerating units will cool it to 5°C. Each turbo refrigeration unit has a connected load of 950 kilowatts. In addition to the compressors, the many pumps, valves and other units require electrical power. Therefore, a new low-voltage switchgear also had to be designed and built for the refrigeration units in the new Power Plant East. This is where Rittal's Ri4Power system comes into play.

The low-voltage switchgear had a special requirement: withdrawable technology for the individual outputs. As part of this technology, each of the safety devices for the larger load feeders are housed in a single withdrawable unit. They can be replaced without having to switch off the entire system. In the event of a power failure, maintenance personnel can remove the withdrawable unit in question from the system and replace it with a reserve unit. After a few minutes, the system is fully operational again.

EXPERT WITHDRAWABLE TECHNOLOGY

Based on Rittal's Ri4Power system, system integrator TRIPS has developed and delivered the TRIMOT Motor Control Center with miniature withdrawable units. Up to ➔

THE TRIPS GROUP

As a system integrator, the TRIPS Group automates machines and systems worldwide in the process and manufacturing industries. It provides a complete portfolio from CAD project planning to software engineering for controls, process control systems and visualisation to switchgear commissioning worldwide. Annually, TRIPS produces around 3,000 bayed enclosures, free-standing enclosures, control panels, command boxes and terminal boxes – also with UL approval, special designs or equipped with its own TRIMOT withdrawable technology.

POWER PLANT EAST

For ten years, the necessary refrigeration for Terminal 2 was supplied by a transitional solution. From now on, Power Plant East will provide the terminal with electricity, district heating and cooling. As head of the electrics shop, Peter Schembera (top right) is part of the team responsible for the power plant. At its heart: two turbo refrigeration units, whose low-voltage switchgear is made possible by Rittal's Ri4Power system. The withdrawable technology comes from TRIPS, where Christoph Scherpf (top left) is in charge of the TRIMOT withdrawable technology.

SAFE FLYING THANKS TO RITTAL

Every industry places specific demands on the technology it implements. The solutions Rittal offers for airport applications meet all requirements in terms of robustness and functionality: enclosure, power distribution and climate control technologies, and IT infrastructures. With its system platform “Rittal – The System.” which is complemented by extensive software tools and global service, the company creates a unique application value for the entire airport campus: from the terminal to the runway to air traffic control.

1 On-board supply systems/jetways

Rittal solutions for aircraft refuelling and power supply:

- Outdoor enclosures with power distribution components
- Electronic control enclosures for jetways

2 Lighting

Rittal solutions for lighting aircraft parking aprons and beaconing runways:

- Outdoor enclosures containing complete electrical and IT services for lighting towers
- Compact and large enclosures for transformer and constant-current control applications
- Distribution enclosures

3 Security systems

Rittal solutions for airfield monitoring:

- Outdoor enclosures for IT services in monitoring components

4 Tower

Rittal solutions for safe operations during take-off and landing:

- Low-voltage switchgear with form separation in accordance with IEC 61439
- Network and server enclosures

5 Power supply/control technology

Rittal solutions for building technology, terminal infrastructure and baggage handling:

- Low-voltage switchgear with form separation in accordance with IEC 61439
- Software, design and project planning
- Robust fire alarm and communications distribution
- Floor distributors as free-standing or wall-mounted enclosures
- Bayable large enclosures and compact enclosures
- Enclosure monitoring with Rittal Computer Multi Control III

6 IT solutions

Rittal solutions for data centres:

- Complete Data Centre Infrastructure
- IT racks
- Individual air conditioning concepts for rack, bay and indoor climate control
- Energy management with Power Distribution Racks and Power Distribution Modules
- Modular, scalable UPS technology (Uninterruptible Power Supply)

CLIMATE CONTROL

COOLING THE AIRPORT

Although the architecture of the terminal building with its expansive glass facades provides plenty of natural light, it also necessitates an efficient climate control system. Depending on the weather conditions, the cooling demand in the various airport buildings may be very high. In the summer of 2015, for example, the cooling capacity required on hot days was up to 16 megawatts (MW) – and the new satellite building at Terminal 2 is not yet in service. There are two different refrigeration methods. Dissipated heat from the combined heat and power plant is used in absorption refrigeration units if no district heating is required in the summer. Turbo refrigeration units provide the majority of the cooling capacity. In the new Power Plant East, there are currently two of these units installed, each with a cooling capacity of 5.5 MW.

22 withdrawable units measuring 75 millimetres high can be installed in a TS 8 standard enclosure. The system is freely configurable for the designer. The individual modules are applicable as motor outgoing feeders up to 160 kilowatts or as load outlets up to 630 amperes.

Because the contacting of both power and automation technologies occurs in the side panel, there is plenty of room available for components in the individual modules. The patented contacting system is designed safe against arc faults. Energy and data are transferred via a switchable contacting module between the withdrawable unit module and the function board in the side panel. The cubicle bars are completely insulated. Live links between the withdrawable unit and the busbar are hermetically capsuled until the first connection with a control unit. The individual modules can be safely replaced even with power on and by just one person. The TRIMOT development team equipped the controls with a mechanical lock that effectively prevents incorrect operation. “I replaced a withdrawable unit myself,” says Peter Schembera, “and was surprised by how easy it was.”

The low-voltage switchgear is split into two rooms inside Power Plant East. The section of the switchgear on the ground floor consists of seven TS 8 enclosures. This continuous Flat-PLS busbar system has been designed for a rated current of 2,500 amperes. In addition to the power supply and a coupling panel for the second section of the switchgear upstairs, there are five enclosures with load feeders. The withdrawable technology creates a total of sixteen feeders with outputs between 1.1 kilowatts and 250 kilowatts. One enclosure is equipped with switch-disconnector-fuses, which power the smaller loads. The second section of the switchgear is installed upstairs; its Flat-PLS busbar system has been designed for a rated current of up to 1,000 amperes. Another five withdrawable units have been installed in it, equipped with frequency converters with outputs of up to 75 kilowatts. Currently, only two of a possible four turbo refrigeration units in Power Plant East are installed. “We’ll need the reserve if there is further expansion in the future,” says Peter Schembera.

POSITIVE VERDICT FROM AIRPORT OPERATIONS

Since 1 June 2015, refrigeration has been running in the new Power Plant East. “Low-voltage switchgear was ready for use at precisely the moment when the turbo refrigeration units were due to be put into operation,” says Peter Schembera. Munich Airport operations was also very satisfied with the TRIMOT withdrawable technology and Rittal’s Ri4Power system. Peter Schembera sums up his positive experience: “We are very pleased to have built the low-voltage switchgear with withdrawable technology from TRIPS and the Ri4Power system.” Since the two turbo refrigeration units in Power Plant East went into operation, air conditioning is now ready for the upcoming expansion. The airport’s cooling water cycle is now supplied both from east and west, so that there will constantly be sufficient cooling capacity available for all structures – including the satellite structure, where passengers will be accommodated for the first time at the start of the summer 2016 timetable. ■

RI4POWER SWITCHGEAR SYSTEM

REPLACEMENT MADE EASY
Based on the Ri4Power system, withdrawable units can be quickly replaced. The result: shorter downtimes.

Rittal's Ri4Power offers a comprehensive solution for low-voltage switchgear. The system is based on the proven TS 8 standard enclosure; one of its features is a modular form separation of the switchgear. The ample system accessories available for the TS 8 can also be used for the switchgear. They include practically all products from enclosure lighting to climate control solutions. Either Maxi-PLS or Flat-PLS is used as a busbar system.
In addition to hardware, Rittal also offers its customers support in the form of numerous planning tools. One example is Power Engineering, a software that assists users in switchgear design and layout, automatically selects required items from the Rittal product line and assembles them into a parts list. Therm software enables users to easily select the appropriate climate control solution for their switchgear. This tool takes into account the corresponding rated current and heat loss of installed components.

➔ LINK TIP:
More information about "Rittal – The System." at http://tinyurl.com/Rittal-System

MORE ROOM FOR PASSENGERS
Munich Airport has built a new power plant in its new satellite building. It supplies the buildings on the east side of the airport with heating, cooling and power.

BEST OF CLASS

FAMILY CLASSES STRENGTHEN SOCIAL SKILLS

In 2015 and over the coming two years, the Rittal Foundation will provide an annual grant of 10,000 euros to support the family classes launched by the Dalheim School and the Albert-Schweitzer-Kinderdorf, both located in Wetzlar, Germany. On one day each week, teachers, parents and children meet in the two family classes in Wetzlar to study together. In addition to math and geography, the curriculum includes sensitivity and appreciation training. The joint lessons are designed to improve the social skills of children with behavioural problems while helping them to cope better with everyday life at school.

WELL-READ TRAINEES
Eric Bergmann, Madleine Schwarz, Dennis Herden and Lisa Rödiger (left to right) participated in the initiative "Newspapers and Training in Hesse" together with training coordinator Tina Pfeiffer-Busch.

TRAINEES READ NEWSPAPERS

THE WORLD BEYOND YOUR DOORSTEP

The fourth round of the project "Newspapers and Training in Hesse" – which is funded by the Friedhelm Loh Group – began in September. Its aim is to get trainees to express themselves better and form opinions about what they read. The trainees are given a year-long subscription to the local paper by their employers and in return are asked to read the paper regularly and participate in monthly knowledge tests. The development of their language skills and the improvement in their general knowledge are scientifically evaluated. "We want our students to look beyond their doorsteps," says Tina Pfeiffer-Busch, Training Coordinator at the Friedhelm Loh Group. "Reading the newspaper can open doors and minds.

TAKING THE BURDEN OFF FAMILIES

SUPPORTING THE CHRONICALLY ILL

Over the next three years, the Rittal Foundation will support the KroKi House in Giessen with an annual grant of 8,000 euros. In this facility in Giessen, chronically ill children and young people between the ages of 8 and 21 are given the opportunity to recuperate from hospital stays and medical treatment. They also learn how to cope with their illness and draw greater pleasure from life. Around 100,000 children develop chronic illnesses each year in Germany.

FREEDOM ON FOUR WHEELS

SUPPORTING REFUGEES

The Rittal Foundation has donated 10,000 euros to help the Caritas chapter in Wetzlar/Lahn-Dill-Eder buy a van. In the future the vehicle will be made available to refugees and the people looking after them so that they can go to the doctor's or visit the local authorities when the public transit system provides no means of getting there. As Friedemann Hensgen, Chairman of the Rittal Foundation, explains, "Refugees have invested a lot of energy in a new life, and we want to support them."

55

NEW TRAINEES

ENTERING THE WORKING WORLD

Fifty-five new trainees started working life in the Friedhelm Loh Group in September. They are among the approximately 250 young people who are training and working in one of twenty career fields. Since 2000, the group has trained more than 1,200 people. "The Friedhelm Loh Group offers these trainees the best opportunity to learn, work and grow," says Dr Thomas Steffen, Managing Director Research and Development at Rittal.

AWARDED FOR THE FIRST TIME

RUDOLF LOH PRIZE MOTIVATES YOUNG TECHNOLOGY AFICIONADOS

Curiosity about technology, tireless experimentation and solid know-how: for pupils in the communities where the group of companies has its plants, these attributes are now paying off more than ever. The reason: Friedhelm and Joachim Loh have presented the first Rudolf Loh Prize, named after their father. “Our father was enthusiastic about technology and inspired others,” says Joachim Loh. “With this prize, we want to get young people interested in technology as well.”

The first awards, which include prize money of 200 euros, were handed out in July. Jennifer Eibach and Rabia Kaya, two students at the Johann Textor School in Haiger, were honoured for constructing a solar car from scrap materials. Their schoolmates Luca Born and Jonathan Taxer received the prize for an aircraft they designed themselves, doing everything from making drawings to assembling components. The prize also went to four members of a project team at the Technical School in Dillenburg, who studied ways to test parameters for ball screws. “The technical training at the commercial schools in Dillenburg is excellent,” says Joachim Loh. Germany’s dual education system is synonymous with quality and practical relevance. Joachim Loh encouraged the young people, saying, “If you’re willing to study and work hard, you’ll find an attractive position.”

FOUNDER
Joachim Loh (pictured) launched the Rudolf Loh Prize together with his brother Friedhelm Loh.

2030

will see a national labour shortage in technical fields in Germany, reports the Institute for Labour Market and Occupational Research.

WITH DISTINCTION
The jury for the Rudolf Loh Prize presented the first winners with their certificates.

KHAIBAR FATEHZADA (26)

"My father gave a friend money to get me out of Afghanistan. I was to leave the country because it had become too dangerous since the war started. First someone took me to Russia, where we got on a truck. I don't know which way we went – I couldn't see a thing from the back of the truck. When I was finally able to get out, I didn't know where I was. I asked a man, who told me, 'This is Deutschland.' But I didn't know what 'Deutschland' was. So I asked again. And he said, 'This is Germany.' I knew where I was then. Everything in Germany is so beautiful. In my country the houses and streets are all destroyed."

ESCAPE TO FUTURE

Integration assistance. The Friedhelm Loh Group's unique pilot project helps refugees integrate into working life. The dream of a better future has already come true for two young men – and the project has a good chance of setting a nationwide precedent.

Text: Rebecca Lorenz

THE TRAINEE MENTOR MODEL

Four trainee mentors and three instructors taught the eight refugees the basics of mechanical engineering at the Rittal training workshop in Wissenbach. In addition to milling, turning and drilling, the curriculum during the three-month internship also included reading drawings. "It was a great experience for me to be able to share my knowledge with the interns and take on responsibility," reports 22-year-old trainee mentor Mirco Burbach (photo centre left, left). "And the interns can speak more openly with people their own age." Working together at the training workshop also made an impact on a personal level: many participants continue to enjoy close friendships even beyond the internship.

I can study in peace here," says 26-year-old Khaibar Fatehzada, although the steady hum of a drill can be heard in the background. Stock is wheeled by on a platform cart; the intense heat outside makes for sweat-inducing temperatures on the shop floor. But all this leaves Fatehzada completely unfazed. Wearing a black and pink Rittal T-shirt, he hunches focused over his workbench and reaches for a lamp switch. His three-month internship at the Rittal training workshop in Wissenbach, Germany, is ending in a few days. Before then, he wants to complete his current project – a desk lamp.

Standing here in the Rittal training workshop in Wissenbach and being able to live and study in peace are not things that Fatehzada takes for granted. He considers himself very lucky. His Afghan home has been at war for more than thirty-five years. The streetscape there is dominated by bombed-out houses, uniformed soldiers and checkpoints. Did he have a carefree childhood with solid prospects for the future? Far from it. "Even as a child I wanted to be an engineer. But in Afghanistan you just don't have a chance," Fatehzada notes soberly. "We have very few schools, almost no teachers and no peace." Because the situation deteriorated again with the withdrawal of the foreign soldiers, his father facilitated his escape two years ago.

Nearly 7,000 kilometres away from his war-torn native land, Fatehzada gives the handmade lamp in front of him one last scrutinising look. At the adjacent workbench, his co-worker Eyobel Gebreyesus runs his finger along a detailed component drawing. Then he approaches a large white lathe. The 26-year-old Eritrean also left his homeland for the dream of a better life two years ago. "The political situation in Eritrea has been difficult for years. That's why I fled across Sudan, Libya and Italy to Germany," the refugee quietly explains. "I had to leave my wife and parents behind." Gebreyesus pauses briefly before adding, "I miss them every day."

The stories of these two young men are moving. But they are not isolated cases. According to the UN Refugee Agency, there were approximately 60 million displaced people worldwide in late 2014 – more than ever before. New wars and conflicts like those in Syria, Iraq and Ukraine worsen the situation. Due to the ongoing instability in many nations, very few refugees can return to their native countries. Their future remains uncertain for years.

GERMAN IS A MUST

In order to prevent just this kind of situation, the Friedhelm Loh Group has launched the pilot project "Qualification for Refugees" in cooperation with the Rittal Foundation, the district of Lahn-Dill and the Lahn-Dill Chamber of Industry and Commerce. "As the largest employer in the region, we have a responsibility for the surrounding area, where many people are currently seeking a new, peaceful home," says Friedhelm Loh, Owner and Chief Executive Officer of the Friedhelm Loh Group, in describing the initiative. "We are grateful to have a good life in a country without war and hunger. We want to make that possible for refugees, too."

For that reason, at the beginning of the project, the district council chose twenty potential project participants from all registered asylum seekers in the northern Lahn-Dill district. A language test revealed that only fourteen of them had the necessary basic proficiency in the German language. "Because the refugees' applications did not provide much useful information about their vocational background, we decided to implement a placement internship," says Rittal Foundation Chairman Friedemann Hensgen. For five days, the refugees got a taste of machine and plant operator work at the Rittal training workshop in Wissenbach. Afterwards it was apparent that this job was not for everyone. "Some lacked the necessary language skills for that vocational field, whereas others would have preferred to work in the social sector," says Hensgen. Starting in early May, eight young men took part in a three-month preliminary internship, during which they became familiar with metalworking production processes in addition to the various machinery and equipment.

"At first I was sceptical about what I would be facing on this project," says Matthias Hecker, Director Technical Education at Rittal. "The only refugees I knew were from the newspapers and television. But we have seen really great achievements here. The youngsters were very eager to learn, decorous and polite." In order for the ➔

THE PILOT PROJECT PROCESS

AN IDEA SETS A PRECEDENT

1. Selection: As part of a potentials analysis, the district of Lahn-Dill selected twenty refugees as participants, getting information about their past schooling and careers.

2. Placement: During a five-day placement internship, employers and participants got to know each other in greater depth. Both sides could assess whether German language skills were sufficient and whether there was interest in and suitability for a career in the industry.

3. Preparation: During a three-month preparatory internship, eight participants learned the basic skills of metal and electrical engineering. They worked together with trainee mentors. German was also a part of the curriculum.

4. Certificates: All participants received a certificate of readiness for vocational training. Two were accepted into a training programme. The district is assisting the remaining six in their search for apprenticeships.

LEARNING GERMAN TOGETHER
Eyobel Gebreyesus learned German – not only for everyday life, but also for the workplace – at a Loh Academy course.

EYOBEL GEBREYESUS (26)

"The political situation in Eritrea is difficult. That's why I fled. From my hometown of Tokombiya I walked all the way to Sudan. A car brought me from there to Libya. We drove through the desert for almost an entire week. In Libya, I got passage on a boat that ferried me to Italy. The trip across the Mediterranean took eighteen hours. Munich was the first city I reached in Germany. Now I live in Ehringshausen. I left my parents and my wife behind in Eritrea. I miss them very much."

FOR A MEANINGFUL LIFE

Interview. be top spoke with Friedhelm Loh on the need for rapid integration of refugees into working life.

Mr Loh, you were one of the first entrepreneurs to take action. Why?
Friedhelm Loh: As I see it, a career provides a good, quick opportunity for social integration. After all, work is an essential part of a meaningful life. It is the only way for people to demonstrate their commitment and expertise, establish a livelihood and contribute to society.

What do refugees contribute?
Loh: Refugees contribute not only special talents but also valuable experience, which we urgently need in light of the impending shortage of skilled workers. As a global company, we also benefit from the cultural diversity of our employees. Through them we gain cultural insights that can be very useful for our work in the globalised marketplace.

So it is not just refugees who benefit, but businesses as well?
Loh: The project was a complete success for everyone involved. While we as a company benefit from the talent and expertise of our two new trainees, the refugees get a chance at having a secure future. But we cannot do it alone. This project should also be an encouraging sign for anyone who wants to get involved and assume responsibility. I would like to see many others follow our example!

FRIEDHELM LOH
Owner and Chief Executive Officer of the Friedhelm Loh Group

refugees to understand important safety instructions easily, the Rittal Foundation and the Loh Academy organised a weekly vocational German course. “The improvement in the refugees’ comprehension was noticeable within a short period of time,” Hecker recalls. “In the beginning we had to demonstrate a lot. Now these young men are able to read drawings and they understand more complicated instructions as well.”
Four trainees assisted the 55-year-old manager in supervising the interns. One of them was 22-year-old Mirco Burbach. “I was asked to participate in the project as a trainee mentor. I immediately said yes,” says Burbach. “It was a great experience for me to be able to share my knowledge and take on responsibility. I think it’s awesome that we’re giving refugees the opportunity to learn something here.”

PROMOTING OPENNESS
The trainees were not the only ones who profited from this knowledge sharing. It was also beneficial for the refugees to be supervised by peers. “It made it easier for the interns to speak openly,” opines Burbach. “If one is new and unable to speak German well, it may be difficult to speak directly with a supervisor. We can empathise better with their situation because we’re the same age.”
At the end of the three-month preparatory internship, all participants agreed that the pilot project was a complete success. “We had a really good experience here,” says Hecker. “After only three months, all eight refugees are ready for training.” The project participants consequently received a certificate they can use when applying for vocational training at companies in the region. Instructors were so enthusiastic about two of the eight interns that Rittal accepted them as trainees in early September.
“Getting an apprenticeship at Rittal was my dream from the start of the internship,” says 26-year-old Gebreyesus with a smile. Now, after more than two years of uncertainty, he can finally look forward to a secure future again. And his co-worker Fatehzada is also overjoyed in light of this new perspective. “When I arrived here, everything was new,” says Fatehzada. “But now Germany has become a kind of home for me. The people here help us. They respect us. And they give us a chance to work, to stay here and to live.” ■

➔ CONTACT:
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be top!

Top performances are the order of the day in all Friedhelm Loh Group companies. The record holders on this page are also in top form.

Fastest human on all fours

Kenichi Ito can cover 100 metres on all four limbs in just 16.87 seconds – a world record. The Japanese athlete modelled his running style on the movements of African patas monkeys.

Deepest freshwater lake

Lake Baikal in Siberia is more than 1,600 metres deep, but it freezes over completely in winter. Cars and trucks use its 31,500-square-kilometre surface as a roadway.

Fastest sailing vessel

The Vestas Sailrocket 2 holds two world records. It travelled at an impressive 102.45 km/h over a distance of one mile and hit 121.12 km/h over 500 metres.

Largest walking robot

Tradinno is a fire-breathing robot dragon 15.5 metres long and 3.8 metres wide. It was developed by Zollner for the dragon festival in the Bavarian town of Furth im Wald.

Brightest galaxy

The galaxy WISE J224607.57-052635.0 – discovered by NASA – shines with the light of more than 300 trillion suns and is thus the brightest known galaxy in the universe.

AN OVERVIEW OF THE FRIEDHELM LOH GROUP COMPANIES

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PUBLICATION DETAILS

BE TOP
Magazine of the Friedhelm Loh Group
Issue 02|2015
ISSN 2195-3198

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35708 Haiger, Germany
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PRINT AND LITHOGRAPHY
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PHOTO CREDITS
Page 1: Thomas Hagen; page 3: F.L.G.; page 4 (top): Michael Koch; page 4 (middle right): Brad Swonetz/Redux/laif; page 4 (middle left): Thomas Hagen; page 4 (bottom right): Michael Koch; page 4 (bottom left): Jasper James/Getty; pages 6–7: Thies Rätzke; pages 8–9: Keystone Switzerland/laif; pages 10–11: ChinaFotoPress/laif; page 12: istock; page 13: istock; pages 14–15: Thomas Hagen; pages 16–23: Lefdal Mine Datacenter; page 22: F.L.G.; pages 24–25: Brad Swonetz/Redux/laif; page 26: Brad Swonetz/Redux/laif; page 27: MIT Press; pages 28, 29: F.L.G.; pages 30, 31: Philip Morris Manufacturing GmbH; pages 32, 33: F.L.G.; pages 34–35: Michael Koch; page 36: Gaby Gerster/laif; page 37: Michael Koch; pages 38–39, 41, 42: Jasper James/Getty; page 43: F.L.G.; pages 44–45: Michael Koch; pages 48–52: Anna Thut; page 53: General Electric; pages 54, 55: F.L.G.; pages 56–61: Michael Koch; page 61 (top): F.L.G.; pages 62–63: istock; page 63 (right): Thomas Victor; page 64: F.L.G.; pages 64–65: Frank Schettler; page 65: F.L.G.; pages 66–67: Munich Airport; page 69: Michael Koch; pages 70–71: F.L.G.; page 73: Michael Koch; pages 74–75: F.L.G.; pages 76–80: Michael Koch; page 81: F.L.G.; page 82 (top right): Christopher Jue/EPA; page 82 (middle left): istock; page 82 (middle right): Jonathan Torgovnik; page 82 (bottom left): Zollner; page 82 (bottom right): NASA/JPL.

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XWW00026EN1511