THE MAGAZINE BY ebmpapst OCTOBER 2021

mag

Maximum Sustainability

Max Maier and his son develop a climate neutral urban district based on smart building systems.

PAGE 10

Cover: Lukas Zwiessele, Gernot Walter; Page 2 (clockwise): Lukas Zwiessele, Gernot Walter, Christoph Kalscheuer

Dear readers,

Welcome to the latest issue of the customer magazine. I am pleased to be welcoming you as its new patron, which is one of my new roles as Managing Director of Sales and Marketing. It is a role that I have been delighted to take on. Each issue of the magazine showcases how international ebm-papst is, which is something I value extremely highly. With 15 years of international working experience and almost five years of heading up ebm-papst China, I intend to strengthen and consolidate this aspect even further in our company.

Our core principle is to "think global, act local." This means that, while we may think in global terms as a company, we give our branch offices the freedom to act on a local level, ensuring they are always close to our customers. This is where our local-for-local approach plays a key role: we develop products on site and produce them using local resources. It is an approach that helped us successfully make it through the pandemic in China—a country where we were much less dependent on global supply chains, meaning we could supply goods to our local customers without delays. I intend to continue pursuing this approach in Asia and in the Americas.

We are also focusing on our core business, which is being driven by three mega trends: energy efficiency, digitalization, and indoor air quality. The fact that we are thinking about the quality of the air that flows through our fans may be news to you, but for us, it is part and parcel of our "Engineering a better life" philosophy. For a striking example of this mindset, simply see our impressive cover story, which highlights just what can be achieved when all three trends work in harmony with one another.

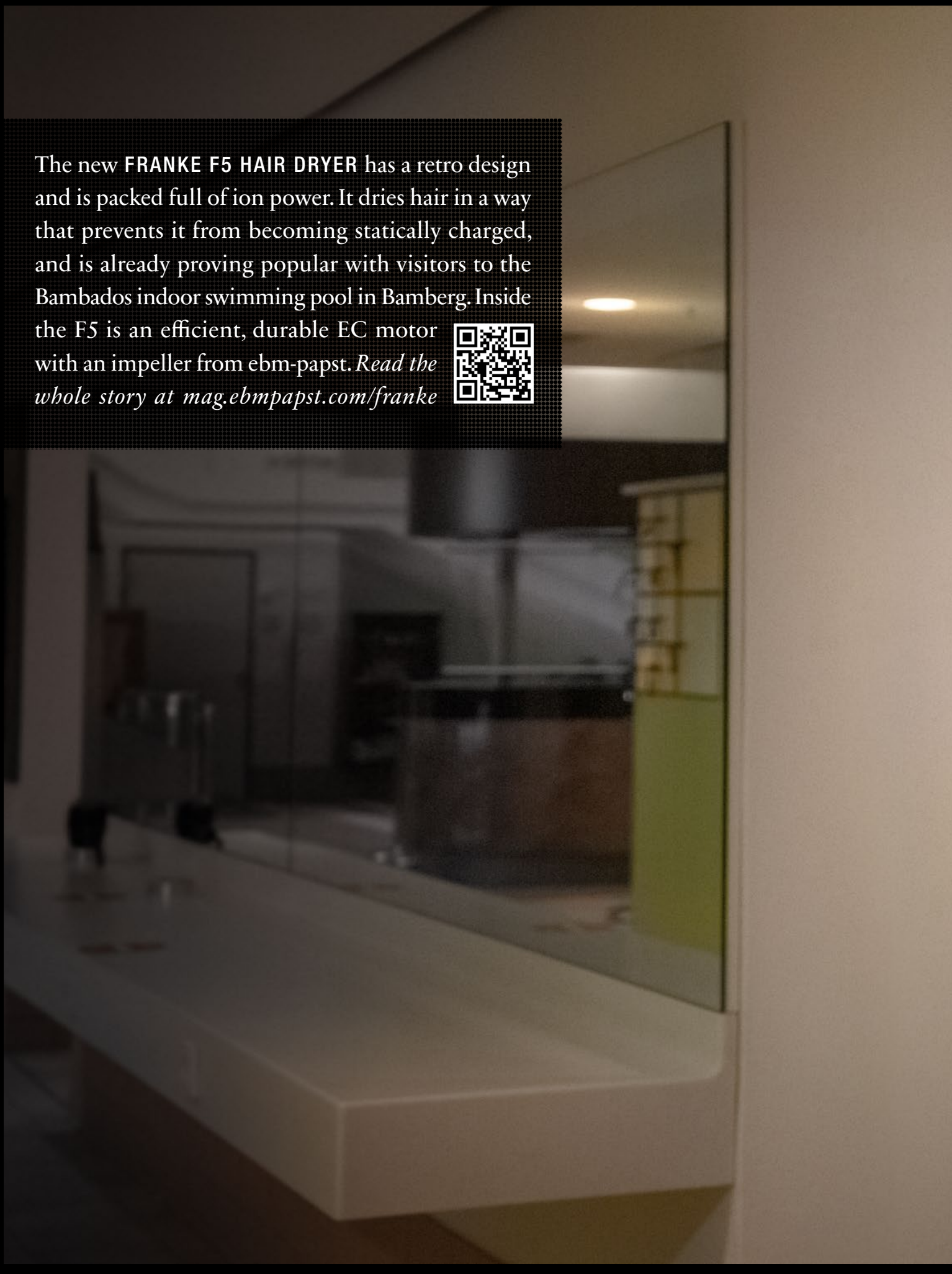
Thomas Nürnberger

MANAGING DIRECTOR
SALES AND MARKETING
EBM-PAPST GROUP

CONTENTS


YOU CAN ALWAYS RELY ON DR. ebm-papst!

Take that, Mr. Ice! ebm-papst has taken an unusual approach with its **AXIECO AXIAL FAN** campaign: Instead of just using traditional brochures to showcase the various benefits to stakeholders in the refrigeration technology and mechanical engineering industries, the marketing team has transformed the device into a superhero with befitting fan-inspired powers. *Take a look at our comic video to watch AxiEco battle his nemeses Mr. Ice and Pressure Man: https://youtu.be/vqmu9O4NmLI*



The new **FRANKE F5 HAIR DRYER** has a retro design and is packed full of ion power. It dries hair in a way that prevents it from becoming statically charged, and is already proving popular with visitors to the Bambados indoor swimming pool in Bamberg. Inside the F5 is an efficient, durable EC motor with an impeller from ebm-papst. *Read the whole story at mag.ebmpapst.com/franke*

Reliable fans for the long term

Every time the natural gas bus sets off, dropping children off at school, parents at work, and grandparents at the shops, it is being powered by its special "green" engine. Not only does it emit less CO_2 than a diesel bus, it is also a much cheaper alternative form of fuel—which is good news for the finances of transport operators. To comply with its low exhaust gas values, lambda probes are located in the exhaust gas flow of the pre-catalyst. And keeping them cool is a specially installed axial compact fan from ebm-papst, which has no problem mastering the task. This compact unit cools the probes reliably—whether it is 40 degrees Celsius outside in summer or in freezing temperatures in winter. This helps to further reduce the low maintenance costs for the Citaro NGT natural gas bus, made by commercial vehicle manufacturer EvoBus GmbH. ●

Read more about this at:
mag.ebmpapst.com/evobus

»We are becoming even more international«

Thomas Nürnberger has been Managing Director of Sales and Marketing at the ebm-papst Group since April and has been President of ebm-papst China for five years. In an interview, he talks about international diversity and what customers can expect from him.

Mr. Nürnberger, you have been living in China for 15 years now. What part of this experience will you draw on for your new role?

15 years shape you a lot, make you more open to other perspectives and cultures, and make you adaptable. Of course, that all helps if you want to do business in other regions. China is very fast paced. It only took China 15 years to go through the same development that took Germany 50 years. This is something that really fascinates me, as is the importance the Chinese place on prioritizing the customer's needs and their willingness to try new things.

Thomas Nürnberger brings with him a wealth of international experience.

You speak Mandarin, and are married to a Chinese woman. What role does diversity play in a global technology leader's sales?

Women, men, different generations, countries, cultures, areas of responsibility, languages: diversity is important because it brings more input and ideas into the company. I want ebm-papst to become even more international with me.

What, therefore, is your main focus in sales when dealing with your customers?

We want strategic partnerships, in which we interlink our customer's roadmap with ours. We have done this in the past, but in the future, we will need to make this even stronger, and stronger beyond Europe. We are already serving the Asian market from China with specific products. We want to expand this globally. Our modular solutions will help us to achieve this.

Which challenge is currently occupying you most?

Supply is currently the most difficult issue and that is the same for the whole market. In the coming years, customers will also want to be supplied more flexibly, quickly and economically. To achieve this, we need to remain competitive with our innovations as well as through our global footprint. By relying on local supply chains, we avoid freight costs and are close to our customers.

Innovation can go in two directions: you can have the best and most energy-efficient product, but you can also offer a good-enough product at a good price. We do not make any compromises when it comes to quality, but we tailor products to the specific market requirements. Design-to-market and design-to-cost will guide us there. ●

Cloud-based urban district

The urbanharbor in Ludwigsburg covers an area of more than 200,000 square meters. It is an ecosystem of gastronomy, retail, and entertainment, as well as start-ups from the region.

COMPANY
max maier urbandevelopment

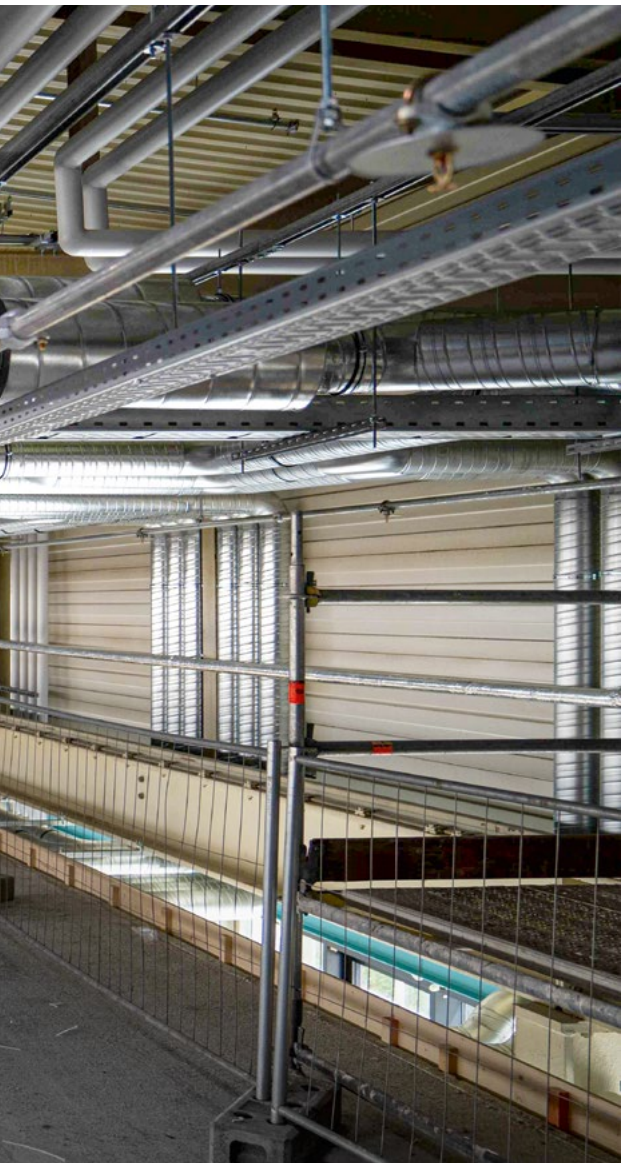
LOCATION
Ludwigsburg, Germany

Europe's very first climate neutral urban district is being established in Ludwigsburg, Germany. It is owned by the Maier family, who have made the most of what digital connectivity has to offer, in order to maximize the site's sustainability credentials via the cloud.

Imagine how great it would be to walk through a room and have the fresh air that you need to breathe follow you every step of the way. And to know that this fresh air is not being provided unnecessarily to empty rooms (after all, who is going to need it there?). This type of system would not only mirror actual demand as closely as possible and minimize wastage, it would also be ideal in terms of climate protection. The ventilation system would not have to work as hard, which would, in turn, save a lot of energy that could be used more productively elsewhere. While this might sound like just a theoretical concept, the “urbanharbor” city district in Ludwigsburg, Germany, has in fact made it a reality.

“Sustainability is the common theme that defines all of my business activities,” says Max Maier Senior, owner of the max maier urbandevelopment district and a visionary from the very outset. “For me, that means not demolishing anything, and instead giving existing buildings a new lease of life.” And that is exactly what he has done with the urbanharbor district—a 200,000-square-meter production site that has undergone a complete transformation.

The production halls that were once used to manufacture refrigerators and similar goods have been transformed into state-of-the-art offices for start-ups from the region, who work to bring their pioneering ideas to life. “Our vision is to be the first operational climate neutral urban district in Europe by 2030,” explains Max Maier Junior, who has been a partner since 2017. “To achieve this, we make sure the energy is supplied exactly where it is needed in order to optimize the processes within this ecosystem. But for this to work, everyone needs



Max Maier Junior and Senior look at the big picture. The urban district of the future is being created, embedded in old production halls.

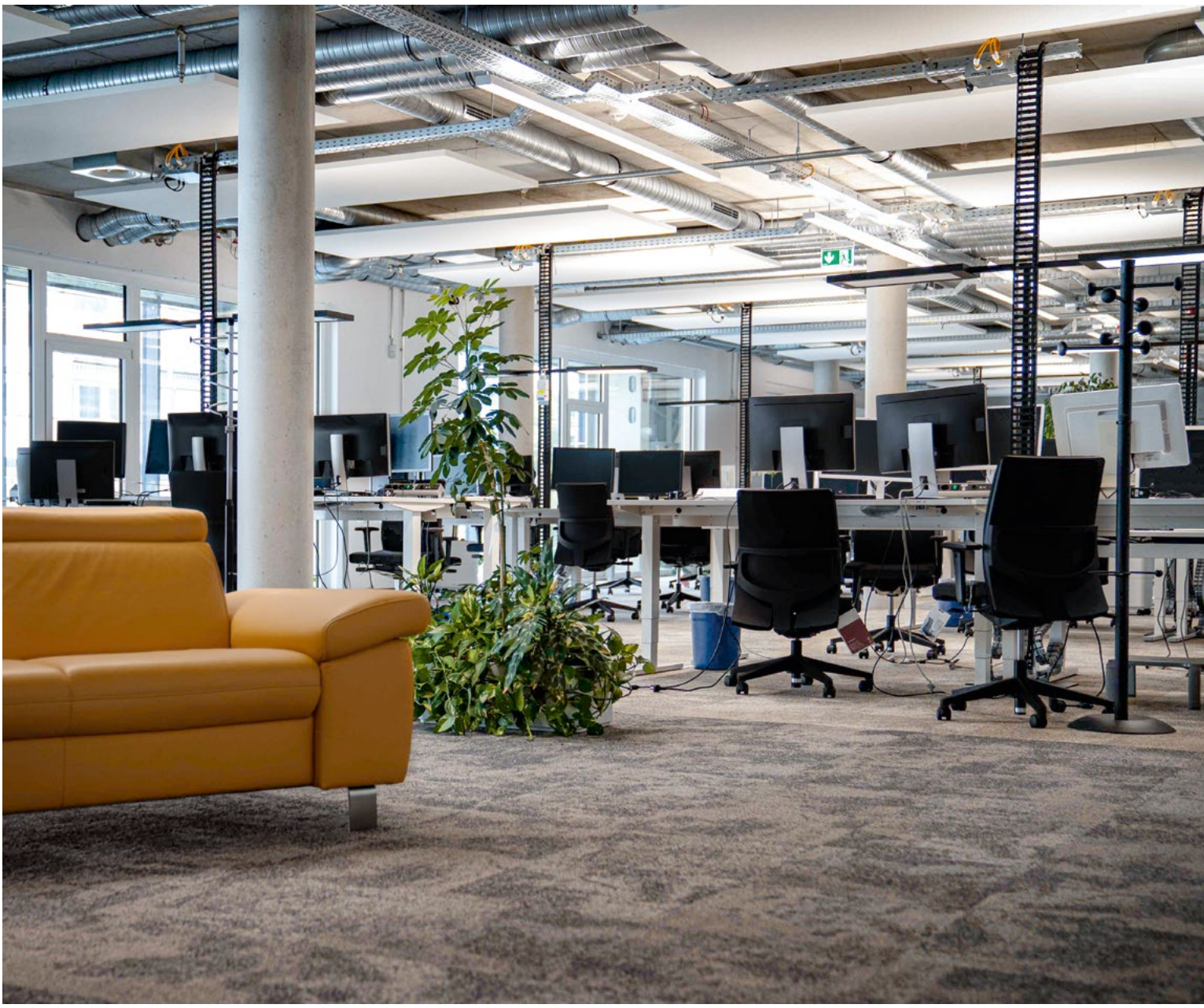
to collaborate and we need to leverage the benefits of digital connectivity in the cloud."

From electric charging stations to ventilation technology

The most impressive demonstration of this vision can be seen in Hall 8, which is the largest hall and measures some 10,000 square meters. It has been transformed into a "building within a building"—entirely in keeping with the Maier family's overarching philosophy. The old building shell still has a working crane track, but now also boasts new, two-story offices providing the workspace of the future. "This transformation alone means 75 percent less CO_2 than for a new build, because we save a lot of embodied energy that would otherwise be required for construction, raw materials, and transportation," says Max Maier Senior. "The foundations and the basic infrastructure were already in place. And we are using the air cushion between the external and internal facades as additional insulation, like you find on a thermos bottle."

But that is not all that Hall 8 can do: all the areas of the energy ecosystem—the sustainable energy management system, e-mobility infrastructure, facility management, logistics and the food system—dovetail with one another. These range from the solar power system on the roof, to quick-charging stations for electric vehicles outside, to smart ventilation and technical building services, and even multiple-use systems for the food supplies. "We think holistically about how to include all the different aspects," explains Max Maier Junior. "That is why we will collect the data from our various partners in real time in the cloud to build a

Lukas Zwiessele



holistic picture, and then leverage it to manage energy usage across the site in a way that reflects actual demand."

If, for example, all employees want to charge their electric vehicles during their lunch break, and nobody is using the large meeting rooms at that time, the system will redirect the energy from the ventilation system in those rooms to the battery storage system. "But our efforts to interlink all these areas of the energy ecosystem will prove unsuccessful if we fail to take the same approach within each specific area, such as the ventilation and technical building services. If several employees move from their workstations to a meeting room, more air will be needed there and less will be needed elsewhere." Max Maier Senior and Junior opted for an air management concept never before seen in Europe: a semi-centralized ventilation system complete with cloud-based Building Connect platform from ebm-papst, which will enable them to manage the site based on actual demand.

Air supply exactly where it is needed

"Looking back, nothing about this project was straightforward," says Christoph Hornek, CEO of i-on Engineering GmbH, who was responsible for the ventilation and technical building services. "But that just spurred me on even more to try new things." Hornek normally uses air flow controllers in his air conditioning and ventilation systems to regulate the volume in each zone. To regulate the air volume, a control valve is closed until the desired air volume is reached. Energy is wasted

It is still really quiet first thing in the morning. Once the first employees arrive at their workstations or head to meeting rooms, the air is conveyed to exactly where they need it.

The space between the hall facade and the outer wall of the offices is used as additional insulation. However, routing the ventilation ducts here was no easy task for ventilation engineer Christoph Hornek.

Lukas Zwiessele

during this restriction of the air flow. However, the idea in Hall 8 was to make sure this energy was not consumed in the first place, and to design the AHU (air handling unit) to have the lowest possible power output. Another key factor was ensuring the best air quality. There are no windows, so the only fresh air the employees have is the air that flows through the ventilation system. This means the air is heated and humidified in winter, and cooled and dehumidified in summer. The system also filters out fine dust and organic compounds (known as TVOCs or total volatile organic compounds) that could make employees feel unwell. In this context, it becomes clear that this valuable air is not wasted. "We see air here as a form of subsistence," says Hornek. "In fact, it is the most important thing we have."

"We see air here as a form of subsistence – it is the most important thing we have."

CHRISTOPH HORNEK

CEO OF
I-ON ENGINEERING GMBH

Achieving these benefits necessitated the use of highly efficient fans that precisely measure the air flow and independently maintain it to suit the demand in each office zone.

Christoph Hornek chose to use EC centrifugal fans from ebm-papst. Around 300 of them have been installed in sound-insulated housings and are located where the air flow controllers traditionally sat. For the employees one story down, they are completely silent. Their compact dimensions were also ideal for Hornek, as the crane track in the old industrial hall restricted the available installation height under the roof to a minimum. But how do the fans know where exactly the 400 employees are located across the 10,000-square-meter site and which level of air performance is required?

The data's path: First it travels from the RESET-certified sensor to the ebm-papst cloud, and is then processed and sent to the fans for control. You can also view all the data on the Building Connect platform.

Building Connect—the brains behind it all

"ebm-papst neo, the digital subsidiary of ebm-papst, had developed software for this specific scenario at that time. I knew immediately that Building Connect was what we were looking for," says Hornek, explaining his decision. This cloud-based data platform obtains real-time data from sensors in the office buildings, processes it in the ebm-papst cloud, and then issues the relevant control commands to the fans. Alongside temperature, humidity, TVOCs, and fine dust, the sensors also measure the CO_2 content in the air—and it is this that determines how the ventilation system responds. "The ideal value is 600 parts per million or less," explains Bernd Röhrscheid, Technical Project Manager at ebm-papst neo. "We find it harder to concentrate once the value reaches 1,000 parts per million, as at this point the air quality becomes noticeably worse. So, once the value reaches 900 parts per million, our sensors start to inform the local fans that they need to increase their air performance accordingly. They then ventilate the rooms until the value is back within the ideal range." As a result, the employees benefit from a comfortable working environment.

Standard-compliant sensors

All sensors are RESET-certified, which means they are certified according to the only real-time-based-internationally recognized air quality standard for indoor applications. The measured values are continuously checked by an independent third party. Building Connect provides Bernd Röhrscheid and Christoph Hornek with an accurate representation of their rooms on their tablets and other electronic devices, meaning they can access all of their data at a glance. The energy consumption can be analyzed and optimized at any time. In future, all data will be sent to the urbanharbor cloud so that the site can be managed holistically, taking into account all areas of the energy ecosystem.

Urban district goes beyond offsetting own emissions

"This concept has enabled us to save around 50 percent of the air that would need to be treated and 30 percent of the electricity that would be required to convey the air," says Christoph Hornek. Max Maier Junior has also done the sums: "In Hall 8, we are assuming a worst-case scenario where, in addition to offsetting 700 metric tons of emissions to achieve climate neutrality, we will actually over-compensate an additional 63 metric tons of CO_2 thanks to producing excess solar power. That is equivalent to planting more than 5,000 trees. Our best-case scenario, however, assumes the hall will over-compensate by around 250 metric tons." The task now is to expand this to the other halls—and from there, perhaps even to other sites around the world. ●

TAKE A LOOK AT THE VIDEO OF THE PROJECT: mag.ebmpapst.com/urbanharbor

COMPANY
Walter Roller

LOCATION
Gerlingen, Germany

Full of conviction

Walter Roller GmbH & Co. began to systematically convert their refrigeration and air-conditioning equipment over to EC technology as early as 2011. Pioneers CEO Wolfgang Krenn and Product Manager Andreas Binder discuss what drives them, how their customers have reacted, and the role that EC plays for them today.

Wolfgang Krenn, CEO of Roller, has been with the company since 1997. He was responsible for sales when the company switched to EC technology.

Andreas Binder, Product Manager at Roller, has worked at the company since 2008. He was involved in the transition for ten years in his role as development engineer.

Lukas Zwiessele; Christoph Kalscheuer

What motivated you to switch to EC technology ten years ago?

Wolfgang Krenn: As a company, what drives us is improving the overall efficiency of refrigerating plants—whether this involves the geometry of the pipes, conductivity, or optimizing the de-icing process. For us, EC technology is another component of this overarching philosophy. The decision to switch from AC to EC was therefore completely logical.

Andreas Binder: At the time, there was an increasing focus on climate protection and saving energy. If we take a look at an air cooler, the fan is the component where we can minimize power consumption.

How did your customers react to EC?

Krenn: They were initially very skeptical. They were worried that there would be electronics in the cold store—where it is cold and damp and pressure washers are sometimes used! The EC motor was also more expensive.

How did you win over the skeptics?

Krenn: I can still clearly remember my first visit to a customer. I had an evaporator built with a new EC motor and a Q motor (which had been in use to that point) which also displayed the power consumption. I loaded it into my trunk and drove to our wholesalers. They could immediately see that the Q motor was using 80 watts and the EC motor just 27.

And the real highlight is that users save twice over! The EC motor uses less power, which means it also emits less heat that the refrigerating plant has to convey out of the cold store. This really impressed me—twice the benefit, twice the saving. This and the resulting quick payback period are what also won over the skeptical customers.

But your customers, and by that I mean the wholesalers, do not gain any advantage from this saving!

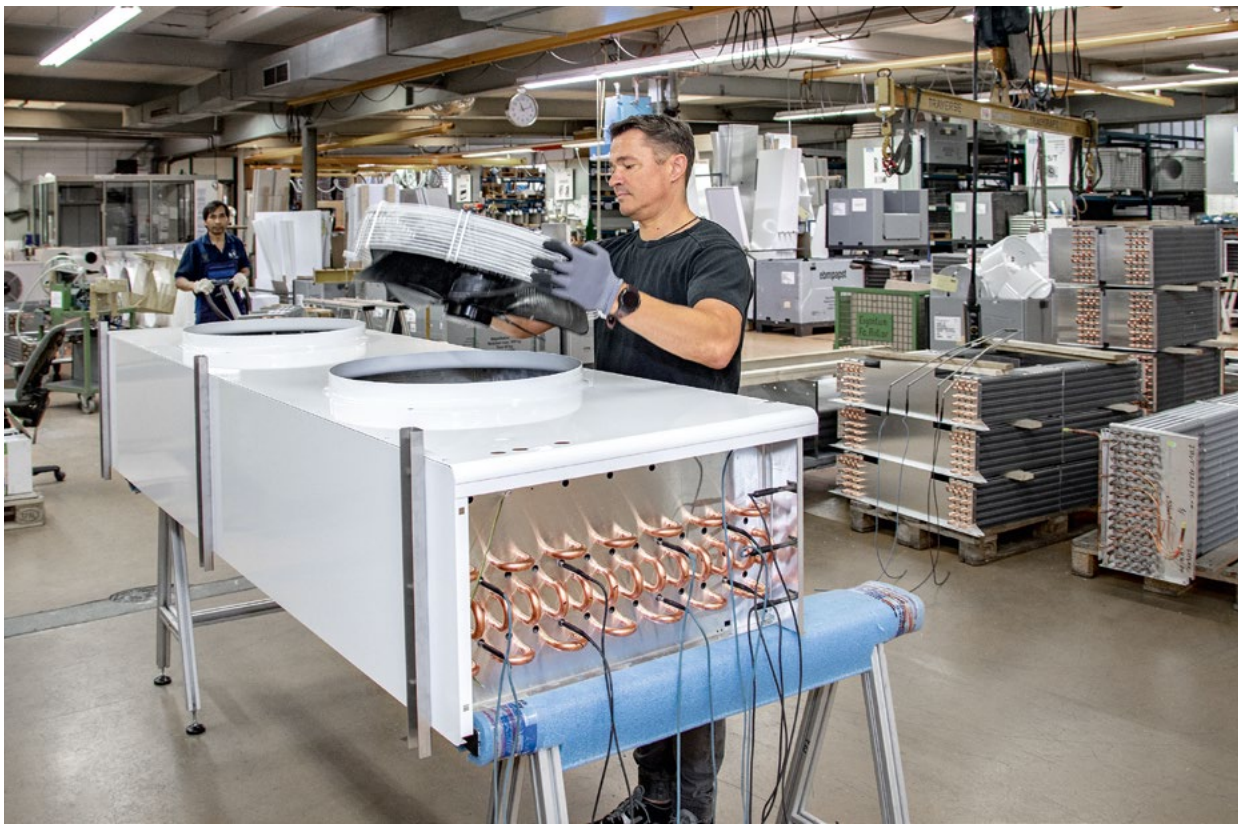
Krenn: Yes, that is true. At the beginning, we even assumed a part of the extra cost to reduce the barrier for our customers and to launch the technology on the market. Over time, something interesting happened on the market. Various operators, for example of large supermarket chains realized that they could save on operating costs with EC fans. They then explicitly requested them in their calls for tenders. Those who could already offer EC technology had a clear edge over the competition. This led to a knock-on effect on the market and, as a result, the extra cost became less of a factor.

And what about other cooling applications?

Krenn: Innovations often have a difficult time in the refrigeration industry. This is because energy efficiency is not as significant in certain applications. However, I feel there is another important advantage to EC technology: the excellent control characteristics of the motors. This is a huge advantage when it comes to sensitive chilled goods or applications with fluctuating loads.

Binder: You should also bear in mind that the fans can easily be controlled to run at other speeds, giving customers a great deal of flexibility in how they are used. Which means we do not have to stock as many fan types, as we can use them in applications where different speeds are required.

In 2012, Roller switched to EC technology in three evaporator series. Now, almost all their devices use the energy-efficient and continuously adjustable technology.



Roller is constantly improving the overall efficiency of its devices. EC technology is an important component in this.

What was the role of the Ecodesign Directive in this development?

Binder: Our customers naturally expect the product that they are buying to meet all the directives. But, to be perfectly honest, because we changed over to EC technology so early, the ErP did not concern us at all. We were on the safe side before the directive introduced more stringent requirements.

How has the switch to EC continued in your company?

Binder: When I joined the company, we had one EC fan in use. In 2012 we converted three evaporator series, and then other devices were gradually switched over. Now, approximately 95 percent of our products have EC motors.

Krenn: Servicing is also always a major factor for us. Our EC application for air coolers is designed as follows: if an AC or Q motor fails, the EC motor can be swapped in like-for-like quickly and easily. This meant that we were also able to change over our supplies of replacement parts completely, and only stock EC motors. We were all impressed with the EC technology. You would be hard pushed to find anyone full of more conviction than us. For me, EC is state of the art—it is as simple as that. This is also why we essentially no longer install any other technology. The supermarket operators and plant manufacturers would no longer have it any other way.

How is EC technology received in the different regions?

Binder: Other markets are more sensitive when it comes to price, which is why it is often difficult to introduce EC there. But Southeast Asia has seen a lot of development in this area. At the moment, for example, we have a project with a large supermarket chain in Thailand which is installing EC technology as standard.

Krenn: In this Thai project—and this was the first time I have seen this in the region—not only was EC specified in the call for tenders, but the permitted power consumption was also limited. Our customer is a pioneer there because they have seen how much they can save. But it will definitely take some time before this way of thinking spreads throughout the market in Thailand. ●

Christoph Kalscheuer

READ ABOUT HOW ROLLER STARTED ITS TRANSITION IN 2012: mag.ebmpapst.com/roller

COMPANY
ÖkoFEN

LOCATION
Niederkappel, Austria

With Zero to hero

ÖkoFEN is a specialist in pellet heating. The latest highlight is "ZeroFlame," flameless and emission-free combustion.

Pioneering spirit is at the core of ÖkoFEN, a family-run company in Austria. In 1997, Herbert Ortner, the founder of the company, launched to market the first type-approved pellet heating system in the world. Pellet condensing technology then followed, which cools the hot exhaust gas, re-uses the energy, and also reduces emissions. Today, the current product, the Pellematic Condens, is 15 percent more efficient than its predecessor and has an unprecedented efficiency level of 98.7 percent. So what drives ÖkoFEN? Their commitment to not rest on their laurels at such a high level, but to keep advancing in order to draw out the last quantum of efficiency and cleanliness from their pellet heating systems. Zero emissions here we come!

"We are working for the energy revolution," says Stefan Ortner, CEO of ÖkoFEN. "Over the years we have reduced the emissions from our products more and more. With our new technology ZeroFlame, we have even managed to get to the point where they can only be verified using high-tech measuring instruments in a lab." ÖkoFEN is addressing the hotly debated topic of particle and dust emissions with ZeroFlame, as ever-decreasing emissions values are required for air pollution control. The Pellematic Condens together with the additional ZeroFlame option has an annual average dust emission value of just two mg/m³ (based on 13 percent oxygen). Comparing this with other sources of fine dust shows that per year it only creates a tenth of what is caused by the tire wear on an average car alone. The aim of zero emissions is therefore within reach.

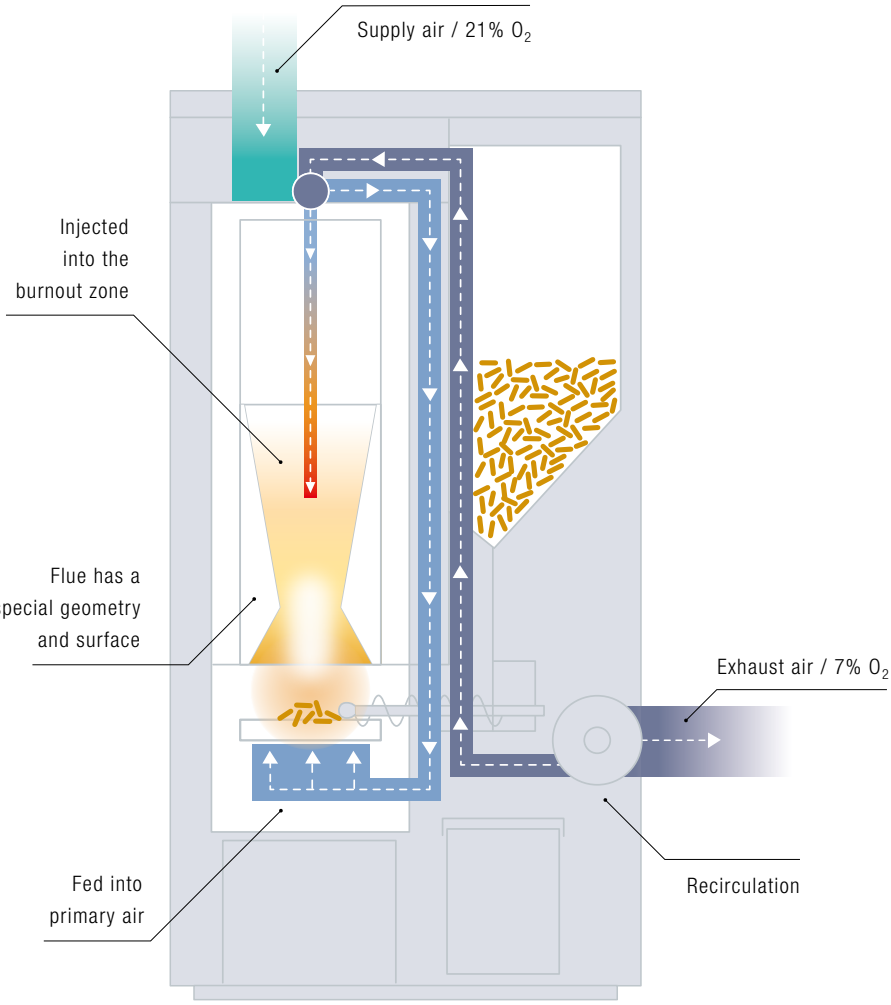
Re-inventing fire

But how does it work? ZeroFlame gets to work directly in the combustion process. This means that the process does not produce the components that expensive particulate filters have to filter out again at a later point. It is—as the name implies—flameless, and therefore emissions free. The resulting heat alone is sufficient to burn the pellets. The highlight is a new, x-shaped flue design and the divided recirculation of the exhaust air. "We feed part of the exhaust air back to the supply air from below," explains Stefan Ortner. "We inject another part from above directly into the high-temperature zone of our combustion chamber." Getting the ratio of the air fed from below and above right is crucial to ensuring that there is no chance for a flame to develop. What was needed for this was a blower that controls the applicable draft conditions with precision.

Efficiency meets efficiency

"The topic of efficiency has always been key for us. It is why we have been working together with ebm-papst for decades," explains Stefan Ortner, illustrating the collaborative relation-

ÖkoFEN CEO Stefan Ortner (left) and company founder Herbert Ortner celebrate a world first in the form of the "Pellematic Condens."



ZeroFlame is innovative because of the special flue design, as well as the divided recirculation of the exhaust air from the combustion process. This exhaust air is fed into the primary air and injected into the high-temperature burnout zone. As a result, you have minimal emissions thanks to the specially developed air flow—without the need for any filters.

ship. "The company's highly efficient components have a positive impact on the current consumption of our devices. It means everything comes together perfectly." Technology from ebm-papst can therefore be found in every Pellematic Condens, for example, in the form of the gear motor which drives the conveying screw in the pellet burner.

The induced draft fan as a special development

When it came to the ZeroFlame technology, ÖkoFEN and ebm-papst together opted for an additional special development: an EC induced draft fan with special software. This fan can be controlled taking into account the applicable draft conditions, in line with the air flow requirements, and it can also draw the residual combustion exhaust gases to the outside. "EC technology is ideal for this as it is extremely efficient and easy to control. This starts from just ten percent output," explains Project Coordinator Thorsten Hartl, from ebm-papst Motoren & Ventilatoren GmbH in Austria, and adds: "It also runs really quietly." This is important because the flue of the pellet boiler is routed inside the building. The flow conditions in the induced-draft housing therefore have to be perfect so that the air inside travels quietly. The impeller and scroll housing underwent the appropriate noise optimization measures to achieve this.

Added to this are the higher requirements placed on the components by condensing technology. The cooled exhaust air condenses on the cooler surfaces, which can cause deposits to form. Ensuring that the design is right is essential to help counteract this, especially when it comes to the fan impeller. "In this case, however, the element that was the most specific was the position of the motor," says Hartl. "If it is placed directly in the air flow, it is put at risk by sulfurous gases and high temperatures. This is why the motor is attached with a shaft outside the air flow."

Stefan Ortner emphasizes how important working together with ebm-papst was: "For our pioneering work, it is absolutely crucial that we have a partner who is brave enough to develop things with us that no one else has done before. When my son is 30, he will come to experience the consequences of climate change. I want to be able to say to him that we did everything humanly possible to protect the environment." We are looking forward to the next pioneering steps. ●

The ZeitHaus in the center of Wolfsburg's Autostadt. What can be vaguely seen through the glass facade on the outside can inside be explored in great detail on five floors of the exhibition area: classic and vintage cars that set the hearts of car lovers racing.

COMPANY
Autostadt GmbH

LOCATION
Wolfsburg, Germany

New air for vintage cars

The ZeitHaus museum in the heart of Autostadt (car city) in Wolfsburg is a place that motorists long to see. On five floors of the exhibition area, there are row after row of vehicles – each more fascinating than the last. Retrofitting the ventilation ensures the right atmosphere for people and cars.

As a communication platform for the Volkswagen Group, Autostadt in Wolfsburg makes it possible to experience the company's values and the topic of mobility in all its facets. In addition to the world's largest automotive delivery center, the theme park provides educational opportunities for all age groups, a rich events and cultural program, as well as a varied culinary concept. The ZeitHaus automobile museum there sets the hearts of car lovers racing: there are more than 260 vintage and classic cars of over 60 different brands. Visitors can already catch a glimpse of the exhibits from outside and inside they can admire them up and close on over five floors of exhibition area. Exciting details about their revolutionary properties are provided. After all, the vehicles exhibited there have set standards.

While the vintage cars are still fascinating today, the old ventilation system in the museum has outlived its usefulness. The old belt-driven fans are now around twenty years old. With a retrofit, Autostadt GmbH was able to bring the ventilation system back up to date with state-of-the-art technology: "Our main aim was to achieve a saving of almost 30 kW/h or 25 percent with the upgrade to the latest technology," says Patrick Fricke, Technical Object Manager at Autostadt GmbH. "For us, the conversion with ebm-papst fans was a kind of pilot project. We wanted to find out whether the theoretical calculations for energy savings can also be confirmed in the field—and which other factors have an influence on the return on investment."

Autostadt GmbH

Reaching the target with up-to-date data

This project was a co-production between Breuell & Hilgenfeldt and WOWI-Wickert Heizungs-, Luft-, und Klimaprodukte GmbH. "For this type of retrofit, it is important to record precise performance data at the beginning," explains Dieter Hildebrandt from Breuell & Hilgenfeldt. "The more accurate the system data for current use, the better we can select the right ebm-papst fans in order to achieve the desired efficiency later and to predict the expected energy savings as precisely as possible."

This approach has also been confirmed in the ZeitHaus: Several measurements have shown that the values on the device cards for the old system deviated by five to 10 percent from the current air flow and that the static efficiency value for the system was positively distorted by 15 percent for the intake air, and by as much as 20 percent for the exhaust air. "With our newly measured values, we then used ebm-papst's FanScout selection software to select a solution with two FanGrids with twelve RadiPac fans on the intake air side and nine on the exhaust air side," says Hildebrandt.

Figures that add up

"The savings calculated by Dieter Hildebrandt were even exceeded in the field," says Fricke. "Our pilot project was therefore a resounding success." Breuell & Hilgenfeldt, WOWI-Wickert Heizungs-, Luft-, und Klimaprodukte GmbH and Honeywell eliminated additional interference points thanks to the retrofit. For example, the air flows have been optimized using heat exchangers and sound absorbers, reducing the pressure loss and resulting in a reduction in power consumption. The two FanGrids stabilize the room air. After all, they ensure better inflow for the heat transfer and thus additional power gains. With a power consumption of 6 kW each, the RadiPac fans on the intake air side achieve a total air flow of 79,000 m^3/h and the fans for the exhaust air achieve a total power consumption of 69,750 m^3/h at a power consumption of 4.45 kW each.

"The savings calculated by ebm-papst's FanScout selection software were even exceeded in the field."

PATRICK FRICKE

TECHNICAL OBJECT MANAGER AT AUTOSTADT GMBH

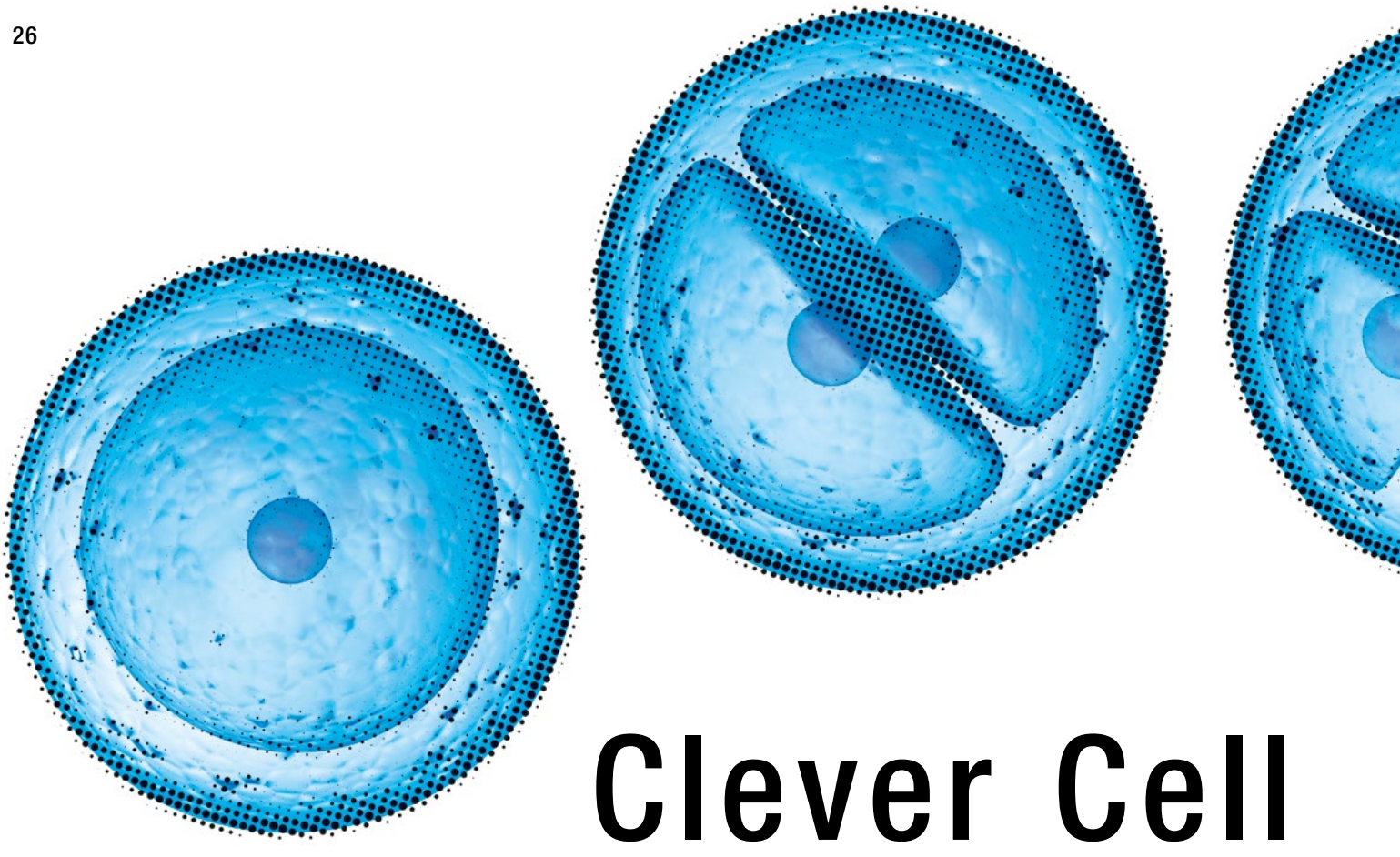
A guaranteed breather

In addition to the fundamental factor in favor of a retrofit, i.e. the energy efficiency, the upgrade achieved much more in the ZeitHaus: The parallel installation of several small fans in a FanGrid increases operational reliability. If there are problems with one fan, the others compensate for the missing power and thus ensure constant operation of the ventilation system.

And one thing must not be forgotten: The bearings of the old fans used to have to be greased regularly. However, the grease contaminated the entire air duct. With the new RadiPac fans, this is no longer a risk, as they run on maintenance-free bearings and are easily accessible for other cleaning and maintenance work. At the same time, this ensures better air quality, which not only pleases the visitors who spend their free time there, but is also good for the exhibits. A feel-good museum visit! ●

After around twenty years, the museum's old belt-driven fans have outlived their usefulness. There are row after row of vehicles in the ZeitHaus museum. After a retrofit, the new ventilation system follows suit: row after row of RadiPacs in a FanGrid—saving 25 percent on energy.

ebm-papst



Clever Cell Incubators

The smart CO_2 incubators from the Chinese company Haier Biomedical allow cells to be cultivated under ideal conditions. The process requires high temperatures beforehand to create a sterile environment—meaning that heat-resistant components are necessary.

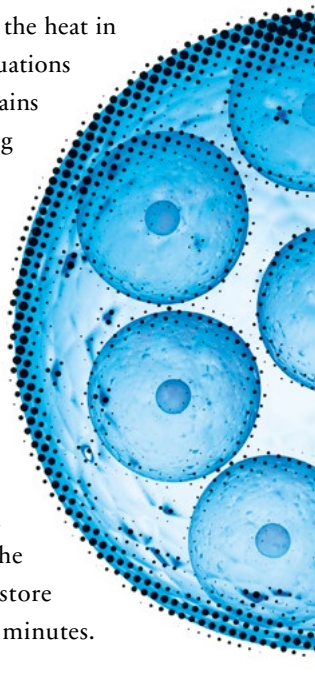
In many laboratories, CO_2 incubators have long since become a standard piece of equipment—whether for incubating human skin cells for skin transplants or for cultivating stem cells in the fight against cancer. The inconspicuous cabinets are an important tool for medical research and have become an indispensable part of many experiments.

High-tech cell division

The incubators are also used in the Chinese National Stem Cell Resource Bank. Their manufacturer, Haier Biomedical based in Qingdao, thought of everything that is needed for successfully cultivating cells. And it is quite a lot. After all, cells like a warm, humid, and slightly alkaline environment to be able to divide.

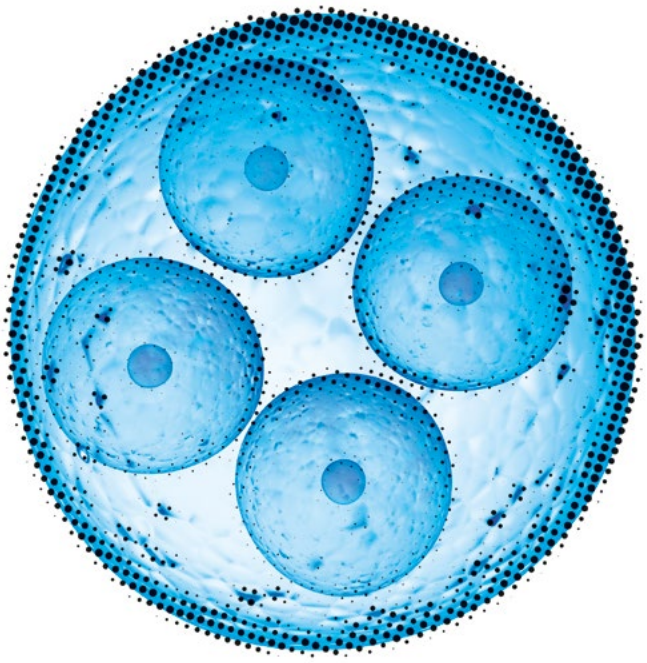
This is why the CO_2 incubators from Haier Biomedical's HCP series have an intelligent heating system that uses a total of 27 sensors to measure the inside temperature. If one area is too cold, the heating system reacts immediately and makes targeted adjustments through the individual inner walls. As a result, the heat in the incubators is constant, with minimal fluctuations of 0.3 degrees Celsius. The air humidity also remains at a consistently high level. Here, floor heating controls how much water evaporates from a tank and rises into the incubation chamber.

Infrared control sensors, in turn, ensure the perfec pH value in the incubators. These measure the CO_2 content in the air and make adjustments in the event of deviations. This means the pH value in the incubators is uniform and in a slightly alkaline range—the perfect conditions for many cells. And this remains the case, even if you open the door briefly. This is because the sensors detect changes immediately and restore the optimum conditions again within a few minutes.



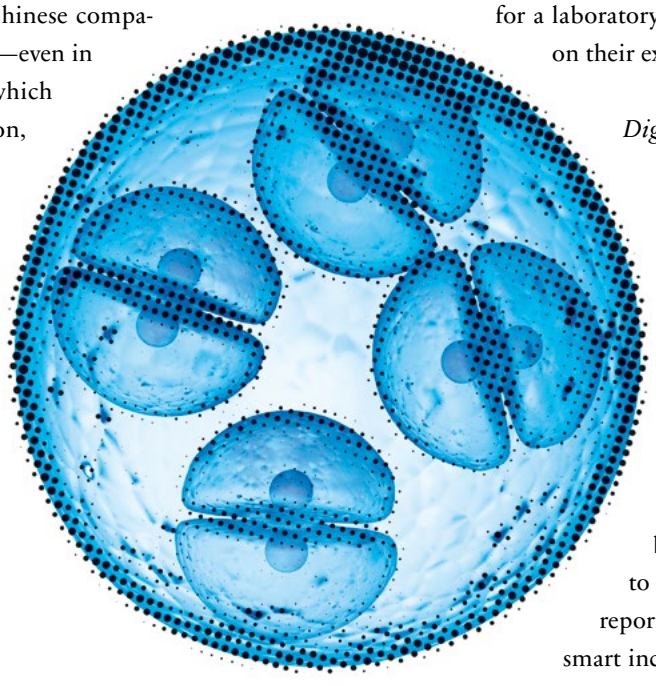
COMPANY
Haier Biomedical

LOCATION
Qingdao, China



Dry heat to prevent germs

However, the best conditions are no help if germs also multiply alongside the cells, thereby distorting experiments. For this reason, the incubators have a self-cleaning option before use. The interiors of the CO_2 incubators from Haier Biomedical are cleaned at the touch of a button using dry heat at 180 degrees Celsius. So stubborn germs do not stand a chance. This all means the Chinese company's incubators are particularly sterile—even in comparison with the competition, which relies on less effective UV sterilization, for example.



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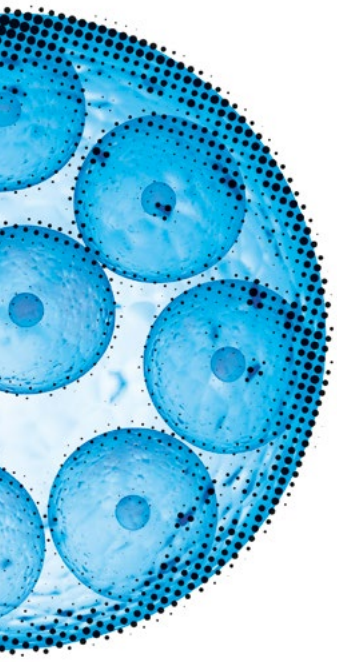


But sterilization at high temperatures also poses a challenge: the sensitive components of the incubator need heat protection. This also applies to the VDC 43.10 external rotor motor from ebm-papst, which in conjunction with a removable fan wheel ensures the air circulates in the CO_2 incubator. The EC motor is therefore equipped with a long stainless steel shaft and a Teflon-sealed ball bearing. The motor and fan wheel still run very quietly, making them perfect for a laboratory where scientists are concentrating on their experiments.

Digital cell monitoring

On the topic of concentration—the CO_2 incubators from Haier Biomedical make the scientists' day-to-day laboratory work easier in another way. The company's incubators can be operated using a touch display and be integrated into the Internet of Things, for example. This means that the incubators independently transmit data to a central computer for evaluation or report problems with the cell supply. The smart incubators can therefore also be monitored and controlled remotely using an app. This enables the lead scientist to check from home whether their long-term experiment is still running. This is not only good for science, but also good for all of us. Because we benefit with our health from the progress and findings in research. ●

Seven energy absorbers in the district heating plant in Asaa absorb energy from the air.

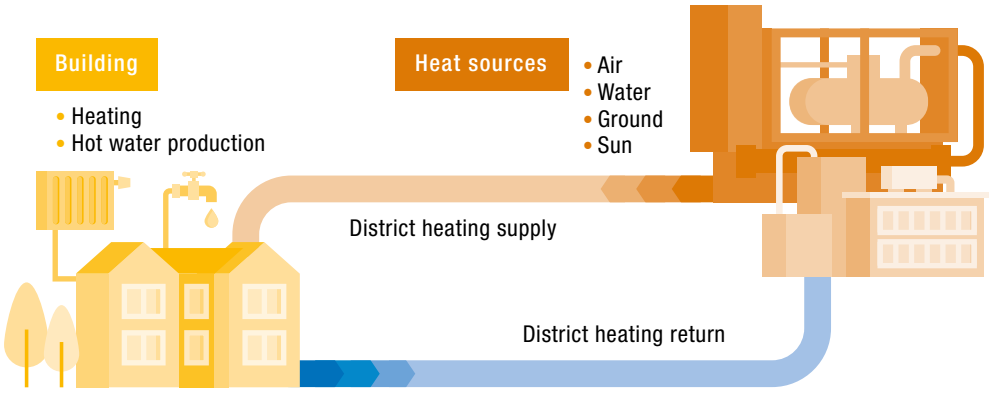
COMPANY
EVAPCO

LOCATION
Aabybro, Denmark

Heat from a distance

Heating is essential in a cold, Danish winter. But burning gas or oil to create it harms the environment. Systems from Aktive Energi Anlæg A/S with heat pumps from EVAPCO offer a clean alternative. Using ambient air, they generate district heat for entire small cities, which benefits both people and nature.

It is a November morning in Asaa, a village in the northeast of Denmark. It is -5 degrees Celsius outside and a cold wind blows around the pedestrians' ears. But, in a single-family home around the corner, it is nice and warm: the heating system provides a cozy warmth. Residents in Asaa heat their homes with a clear conscience, because their heating system is climate neutral. The heat is produced using green electricity in the city's new central district heating system with help from a heat pump. The heat is generated centrally and then distributed to houses via insulated underground pipes. From there, it arrives in the single-family home's heating system. The system was designed by the engineering firm Aktive Energi Anlæg A/S (AEA) together with the refrigeration expert EVAPCO and ebm-papst. It is suitable for villages with as few as 100 houses to small cities with 50,000 inhabitants. AEA organized all of the suppliers and coordinated the project with the local plant operator. EVAPCO supplied the heat pump system and ebm-papst the fans. The three companies joined forces because they suddenly saw a new demand in the market. Tim Thøgersen, Sales Engineer at EVAPCO, explains, "Until then, there were only small heat pumps for single-family houses or gigantic plants for big cities. But when the Danish government promoted district heating, there was suddenly a great deal of interest in medium-sized heat pumps for power stations that generate heat for small communities. Yet, there was no product available for this."



WHAT IS DISTRICT HEATING?

District heating is generated in a central power or heating plant. An own heating system is is not necessary. An underground pipe system conducts the heat into the house.

statista

A reverse dry cooler

Until then, EVAPCO in Denmark mainly produced customer-specific dry coolers for district heating plants or solar plants. Using fans, these dry coolers dissipate waste heat—in hot water, thermal oil or steam—into the ambient air. The manufacturer has been working with ebm-papst for 15 years. The company developed heat pumps for the first time for the project in Asaa. Thøgersen says, "In principle, heat pumps are simple reverse dry coolers. A dry cooler cools water down, a heat pump heats water up. Therefore, our main task was to use calculations to find the right design so that everything would work the way it was supposed to."

A district heating system consists of an air/water heat pump with 2.5 megawatts combined with seven energy absorbers. The energy absorbers contain EC axial fans that draw energy from the air and convey it into the system. EVAPCO fluctuated between two suppliers when choosing the fan manufacturer. In the end, ebm-papst's service gave it the edge: "The support we received from the Danish office was extraordinary," says Thøgersen. "As soon as we get an order, everything has to happen quickly. We have to give the energy suppliers an answer on the same day. ebm-papst always answered our inquiries within a few hours. They also had much shorter delivery times than its competitor."

Please work quietly

The noise level of the EC fans also played an important role in selecting the partner. Thøgersen explains: "It is not unusual for district heating systems to be in the middle of a city, right next to residential buildings. Of course, this means that the EC fans have to be quiet. In this case we have the possibility to use FlowGrids on our AxiBlade fans. They reduce the noise level by two dB(A)." Tim Thøgersen also sees the controllability of the EC fans as another advantage. It is easy to turn the fans down when there are lower heating requirements. This improves the system's efficiency and also decreases the noise. There are around 80 AxiBlade EC fans in this district heating system and they gather ambient heat in every season. Torben Kirkolt, Managing Director of ebm-papst in Denmark, says: "Even if the air is -10 degrees Celsius, it still contains energy." However, in the pilot project, minus temperatures sometimes caused difficulties for the fans as they iced up. ebm-papst was able to remedy this with new software settings. Kirkolt explains, "We have now set the parameters so that the fans are always moving. Even if they are not being used, they simply shake the ice off." The 'FanSet' app from ebm-papst helped them to adapt. Torben Kirkolt and his colleagues were able to activate the parameters easily via MODBUS. He explains, "You simply put your mobile phone onto the fan and press a button. The app then uploads the new information." This means that it is no

Whether spring, summer or autumn — the 80 AxiBlade EC fans work in every season. They can even cope with ice.

> “It is not unusual for district heating systems to be in the middle of a city. This means that the EC fans have to be quiet.”
>
> TIM THØGERSEN —— SALES ENGINEER AT EVAPCO

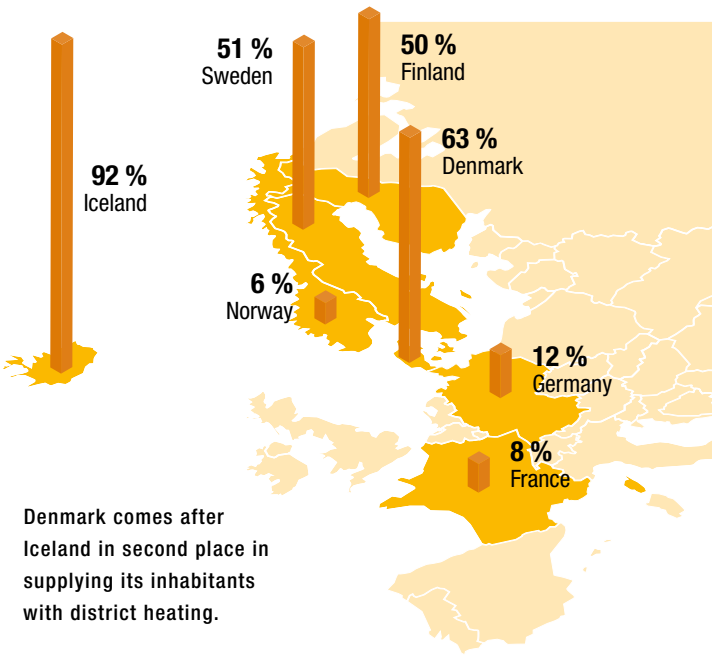
longer necessary to take the fans apart and install new wires. The app from ebm-papst is available for all customers worldwide.

6,000 fewer metric tons of CO_2

After the plant in Asaa, another two local heating systems were set up by AEA, EVAPCO and ebm-papst in 2020. They are located in the villages Vig, with almost 3,000 inhabitants, and Højby, with 1,450 inhabitants, in the northwest of the country. But the three companies are sure that this was just the beginning. In June 2020, the Danish government decided to completely phase out crude oil and natural gas as heat sources in the Christiansborg climate agreement with the aim of reducing the country’s CO_2 emissions. It is increasingly relying on district heating. Today, district heating covers 60 percent of the final energy requirement in Denmark. To compare, the figure is only 14 percent in Germany. Data from the Vig and Højby plants show the positive effects that this is having on the climate. Together, they save around 6,000 metric tons of CO_2 per year compared to when natural gas was the heat source. In any case, the companies are ready to jump into action when any new orders come in. Tim Thøgersen sums up, “Now we have a solid concept that we can reuse at any time. We just have to calculate how many energy absorbers the solution requires and we are ready to go.” ●

EVAPCO

DISTRICT HEATING MARKET IN EUROPE



Denmark comes after Iceland in second place in supplying its inhabitants with district heating.

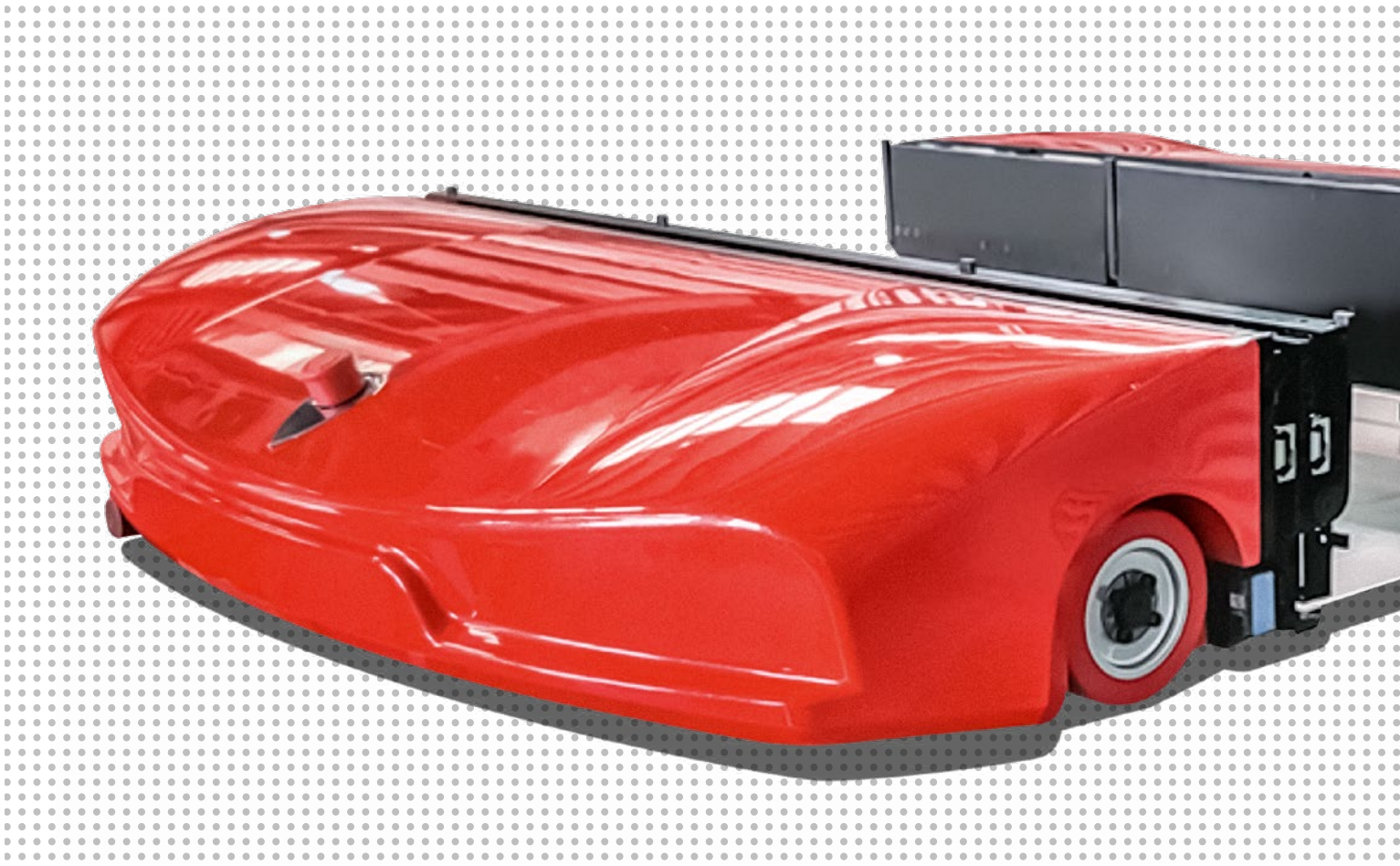
statista

COMPANY
Huazh Intralogistics Technology

LOCATION
Nanjing, China

Shuttle service

Huazh Intralogistics Technology Co. Ltd. develops systems for automated warehouse logistics. Speed is the most important factor for the company, based in Nanjing, China.



Endless lines of shelves, meter-high rows, conveyor belts, spiral chutes, and above all: goods as far as the eye can see. The prospect of someone having to find something in this labyrinth, having to wander through the aisles, all the while imagining customers drumming their fingers impatiently on the table, is unthinkable. Huazh Intralogistics Technology's solutions for warehouses and distribution centers ensure that this nightmare does not become a reality.

The pace in these places is now too fast for humans to achieve on their own. A pace that is not possible without automation. Huazh is driving it forward. Its expertise is based on five core areas: warehouse logistics planning, warehouse information systems, conveyor systems, automated systems for storing and retrieving piece goods and small items, and semi-automatic and fully automatic picking systems. At the heart of the system are the shuttles, which whiz through the

Autonomous shuttles make automated warehouses possible.

Huazh started developing shuttles for warehouses almost 20 years ago. To maintain its pole position, the company now relies on drive systems from ebm-papst.

warehouse on rails and independently pick up and unload goods. The company, which is an offshoot of the University of Nanjing, has been developing them for almost 20 years.

Compact speedster

"This area is very promising and has grown rapidly in recent years," says Liu Feng. The R&D team leader at Huazh is responsible for the shuttles. "The key features of the shuttles are their small size and high speed—which saves lots of space and speeds up the picking and unloading of goods," says Feng.

To improve the latest generation of shuttles, which looks just like a red sports car, Huazh decided to switch from AC to DC motors and enlisted the support of ebm-papst. "We chose ebm-papst due to its high-quality products and excellent local service," says Feng. For various shuttle designs from Huazh, ebm-papst supplies the complete drive systems: brushless internal rotor motors from the ECI series, transmission, encoder, and electronics. ebm-papst supplies both the hardware and the software. The drive systems make the shuttle move forward on the rails, move the telescopic arm that grips the boxes of goods, and lift the boxes.

Agile team

For the system to be perfectly matched to the application, you need a team that works well together. ebm-papst service engineer Donny Tang took care of the implementation on site and spent a lot of time in the Huazh test lab making all the necessary adjustments. But Feng also actively exchanged ideas with ebm-papst sales representative Tyrese Wu and team leader Mike Tang. His summary: "We held together and worked as a team."

The greatest challenge with the shuttle project was, of course, the speed. Huazh gives itself only four to six weeks to deliver shuttles to its customers after receipt of the order. This also has an impact on its partner. ebm-papst talked to its own suppliers, set up new logistics concepts, and brought its internal Supply Chain Improvement team on board. As Feng acknowledges, "ebm-papst responds quickly, enables a rapid exchange of information, and provides a buffer stock of components." ●

"The key features of the shuttles are their small size and high speed."

LIU FENG —— R&D TEAM LEADER AT HUAZH

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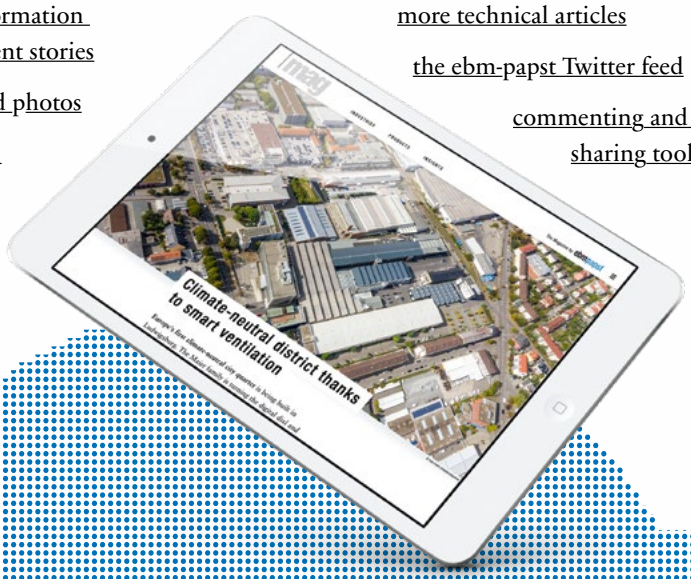

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Publication details

Publisher
ebm-papst Mulfingen GmbH & Co. KG
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kW (H_i) kW (H_s)

Different countries use different units for heat output. If you convert them, you strangely get different kW values. It is all to do with how the thermal unit is defined.

Again and again, you get customers from the USA asking about a blower from a European catalog. Later on, they are surprised because the blower is suddenly designed for a higher heat output (kilowatts) than is stated in the catalog. Why is that?

Sometimes, units are like zombies and they live on after they have been killed off. The majority of people, for example, still think of horsepower when they buy a car or of calories when it comes to a diet—rather than using the modern units of watts or joules respectively. The same applies to the thermal unit. In the majority of European countries, specifying the thermal unit is based on an old definition of how much heat energy you can obtain from one cubic meter of natural gas. In Europe, the reference gas G20 has 34.02 MJ/m^3. This is the European thermal unit Hi. Heating systems are now considerably more efficient. The outdated definition of the thermal unit remained, however.

In the USA, on the other hand, the heat energy that can be obtained from the reference gas G20 is justifiably defined with a higher value, namely 37.76 MJ/m^3. This is the US thermal unit Hs. Now, the USA is well known for having issues with the metric system. This is why they use their own unit for heat output—which you cannot calculate without the thermal unit. The unit the Americans use is the BTU/h (British Thermal Unit per hour, which despite its name is only used in the USA, and not in the United Kingdom). This is why you get a higher kW value in the USA compared to in Europe when converting the heat output from BTU/h into kilowatts—because the definition of the thermal unit is higher in the USA. By the way, in the Netherlands, they use the more realistic American thermal unit Hs, but specify the output in kilowatts.

China uses yet another system

In China there is a particular heat output zombie: the steam ton/hour. This is based on the old coal stoves in the cellar which directly produced steam for the radiators. The quantity of steam per hour resulted in a certain heat output in people's homes. Even today, the heat output in steam ton/hour is still required for large plants in China. There is, however, no method for precisely converting it into kW. Using practical comparisons, ebm-papst has come to a useful equivalent of 635 kW (H_i) ≙ 1 t steam/h.

So do not be surprised if you encounter some confusion when it comes to the units and values used to denote heat output—it is all down to how it is defined. ●

Jörg Scheuerlein, Engineer Heating Mechanics at ebm-papst in Landshut

The fight against product piracy

Not all products that say ebm-papst on them are actually made by ebm-papst. An interview with Ralf Duckeck, Director Intellectual Property at ebm-papst.

Mr. Duckeck, what is your role as Director Intellectual Property at the company?

Together with my seven employees, we handle all tasks related to patents, designs, and trademark protection. This includes pursuing patent infringements. I make sure that counterfeit ebm-papst products are taken off the market and don't damage our good name.

How does this work exactly?

We work on this with an agency called CorSearch, whose software—which also uses artificial intelligence—scours the internet for offers of ebm-papst products. The adaptive software recognizes counterfeits, which then end up on a list. We look at this list and decide which advertisements need to be deleted.

Is that how it always works?

No, sometimes we are also approached by customers who are familiar with the quality of our products but are suddenly experiencing problems. An example of this was when a customer contacted us to complain that the fans they had installed were too loud. We found out that the supplier had unknowingly purchased counterfeit ebm-papst products on the internet because we had a supply bottleneck at the time. Actually, despite all the frustration, we took it as a compliment, as the customer was used to a higher level of quality from our products.

How many counterfeits do you pursue on a routine basis?

In collaboration with CorSearch, we reviewed around 70,000 online ads in 2021. Of these, CorSearch reported 60,000 to us as potential fakes, and 42,080 were removed.

Are there sometimes false alarms?

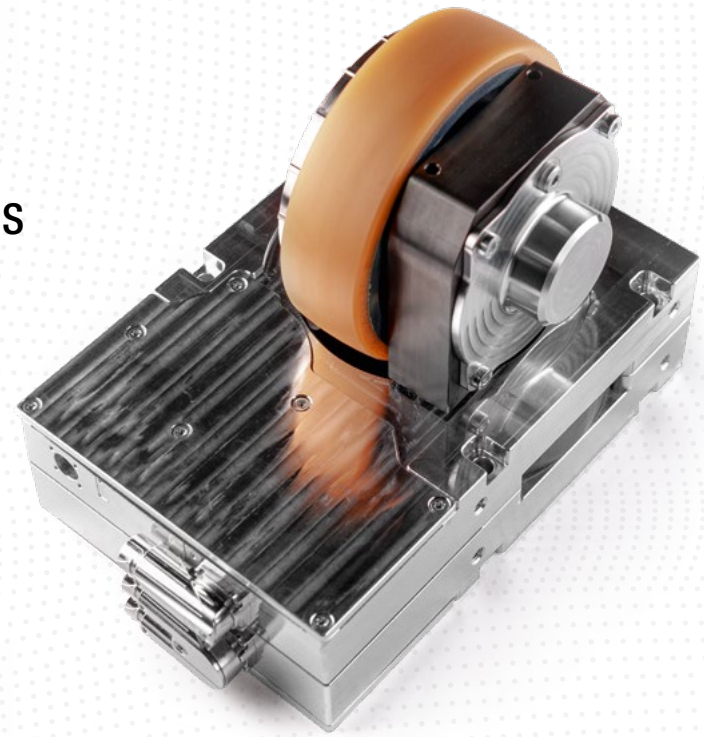
That's quite a rare occurrence, but it does happen. We once had a case where a trainee placed pictures of counterfeit goods in an offer on the internet. However, when we checked, we found that the trader was authorized and that the issue with the pictures was just an oversight. ●

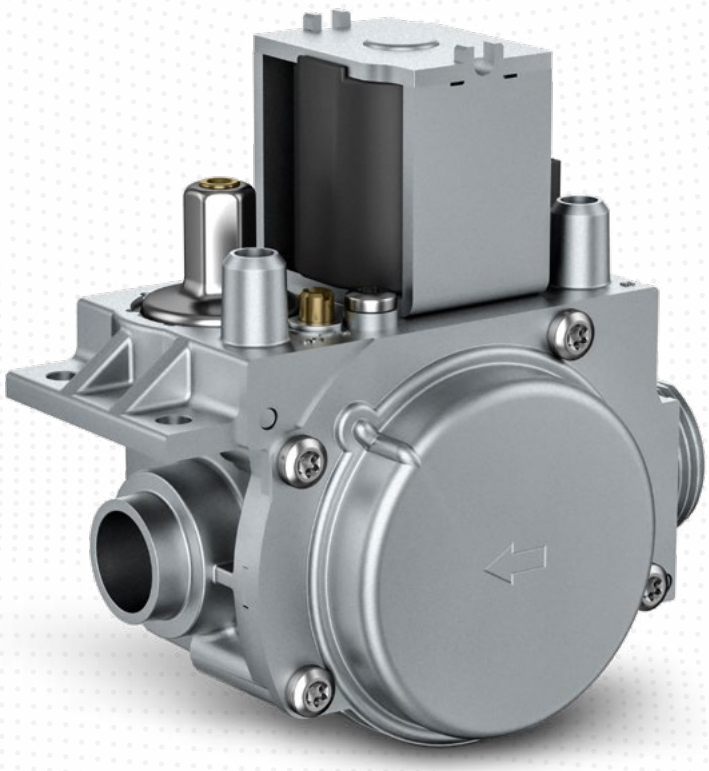
ONE FOR ALL

The new RadiFlex blower is the universal solution for all types of range hoods. This quiet, powerful, and efficient device comes in at just 1.9 kg. Developed for the mass market, it can be flexibly integrated into common hood types. And with air performance of up to 930 m^3/h, the optimized blower ensures that cooking is a breeze.
ebmpapst.com/radiflex

MOTION ARTISTS

The new driving/steering system ArgoDrive enables driverless transport vehicles to navigate freely in any direction. They can easily drive round unexpected obstacles, master inclines and different floor surfaces, and can move effortlessly in the tightest spaces. ArgoDrive brings together propulsion and steering in a single module comprising motors, transmission, sensors and the necessary connections.
ebmpapst.com/argodrive





SMALL POWER OUTPUT, BIG IMPACT

The pneumatic gas valve E01, intended for low power classes, has so far ensured safe operation and optimum combustion in condensing boilers in the power range from 3 to 56 kW. Now, there is another variant designed for the range from 1.5 to 57 kW. The new valve also provides greater dynamic stability.
ebmpapst.com/valves

ebm-papst, Gernot Walter

»Higher efficiency levels reduce operating costs«

Increased power, greater efficiency, less noise. Uwe Sigloch, Director of Product Management at ebm-papst Mulfingen, talks about the development and advantages of the latest-generation RadiPac series.

Mr. Sigloch, what were the key factors driving the enhancement of the RadiPac?

We are constantly improving our fans for ventilation and air conditioning applications because our users' demands are increasing rapidly—particularly when it comes to control options and energy efficiency. The main drivers here are compliance with legal requirements, growing environmental awareness, and the potential for savings on operating costs. We are also optimizing the RadiPac series as part of our continuous improvement process.

How is this demonstrated by the new generation of fans?

The new generation of RadiPac fans operates at higher efficiency levels. Higher speeds also ensure greater air flow and a static pressure increase to up to 2,000 Pa or more, meaning even "high-pressure applications" can be covered. The noise level has also been reduced further. In comparison to the predecessor series, the noise level has been reduced by three to seven dB(A), depending on the operating point. To meet the requirements of different installation situations, this new centrifugal fan series is also available in a standard and short version.

How did you achieve these improvements?

We optimized the impeller in line with the latest aerodynamic findings, which has played a key role in the further development of the fan. In conjunction with the injection molding process used, the high-strength, glass-fiber-reinforced composite material enables a complex shape to be produced. This blade geometry drastically reduces flow losses. The driving force behind the new RadiPac centrifugal fans are high-efficiency GreenTech EC motors in the power range from 500 W to 8 kW. The power output of the integrated electronics has been further improved and the motor dimensions are even more compact. This makes the drive currently the most powerful in its class. ●

YOU CAN FIND MORE INFORMATION AT:
ebmpapst.com/radipac

ebm-papst

Air performance of up to

20,000 m^3/h

Noise level reduced by

3 to 7 dB(A)

compared to the predecessor series

Static pressure of up to more than

2000 Pa

Gernot Walter

WOULD YOU HAVE RECOGNIZED IT? —— THE NEW RADIPAC IMPRESSES WITH EVEN HIGHER EFFICIENCY LEVELS. TAKE A LOOK INSIDE!

50062-7-8811 PM-EN mag 02/2021

Gernot Walter