



# On the road again

Joe Conway earned a lot of miles during his big retrofit job for a supermarket chain in Ireland

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*Dear readers,*

Digitalization is bringing major changes for each and every one of you, in both private life and business. That is also the case for us at ebm-papst, but we got involved with the digital transformation at an early stage, gaining many technical insights and learning one thing above all: Digital products are only truly useful when they provide added value for the customer. Predictive maintenance is one such benefit.

Predictive maintenance is based mainly on connecting products with one another and analyzing their data. That is exactly where we at ebm-papst focus our research and development activities. And we can say with a certain amount of pride that we are already far ahead in this field while others are still at home in the old world.

In the future, you will be able to easily recognize products with digital added value by the new GreenIntelligence label, which combines our focus on sustainability expressed by GreenTech with digitalization.

Even if the raw material used by our products is data, of course we still need analog raw materials to produce those products, and we feel the effects of materials shortages just like everybody else. Of course we cannot solve this problem alone, but we are making a major effort to minimize the impact on you—so that you can join us in designing the digital world.



**Stefan Brandl**

—  
CEO OF THE  
EBM-PAPST GROUP



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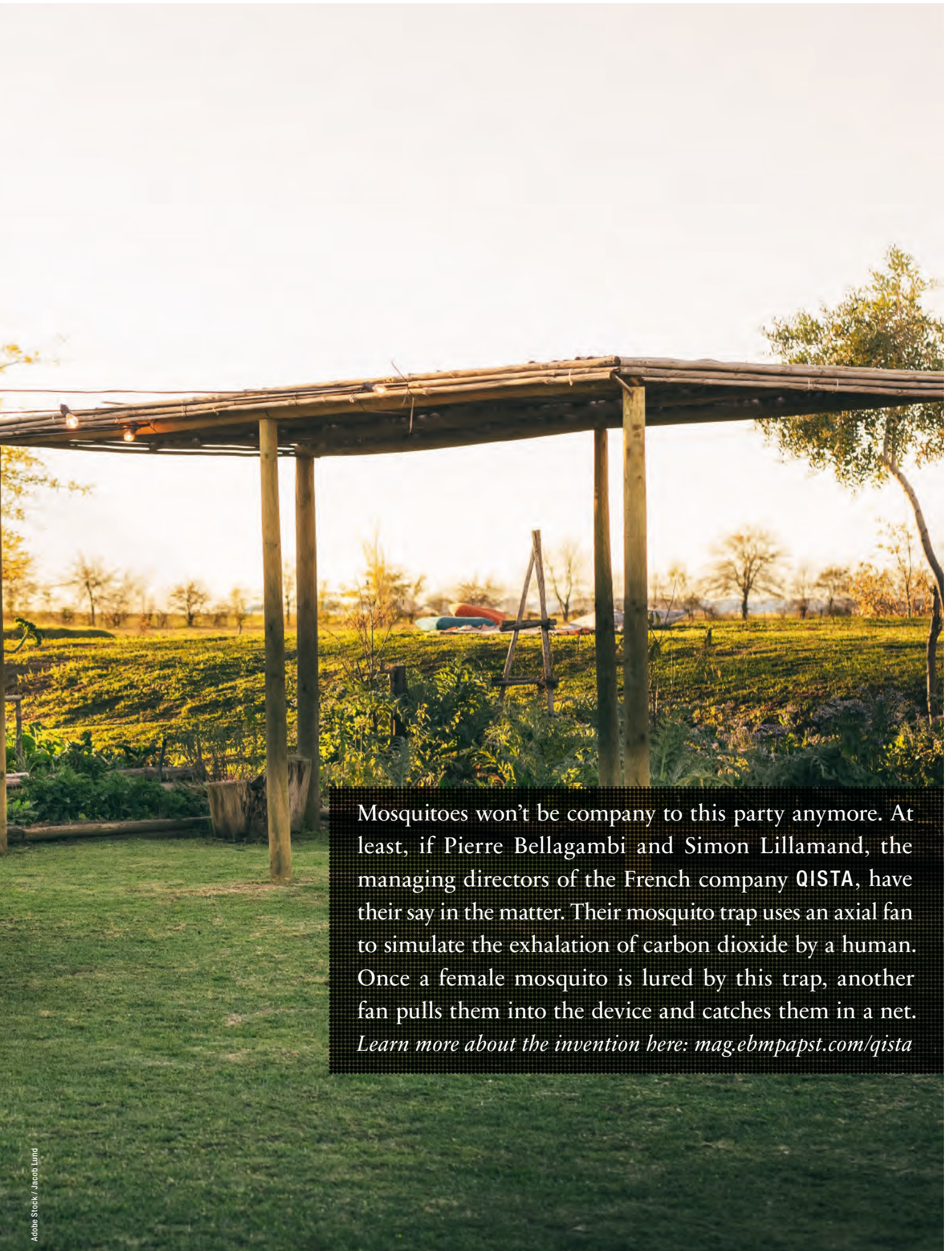
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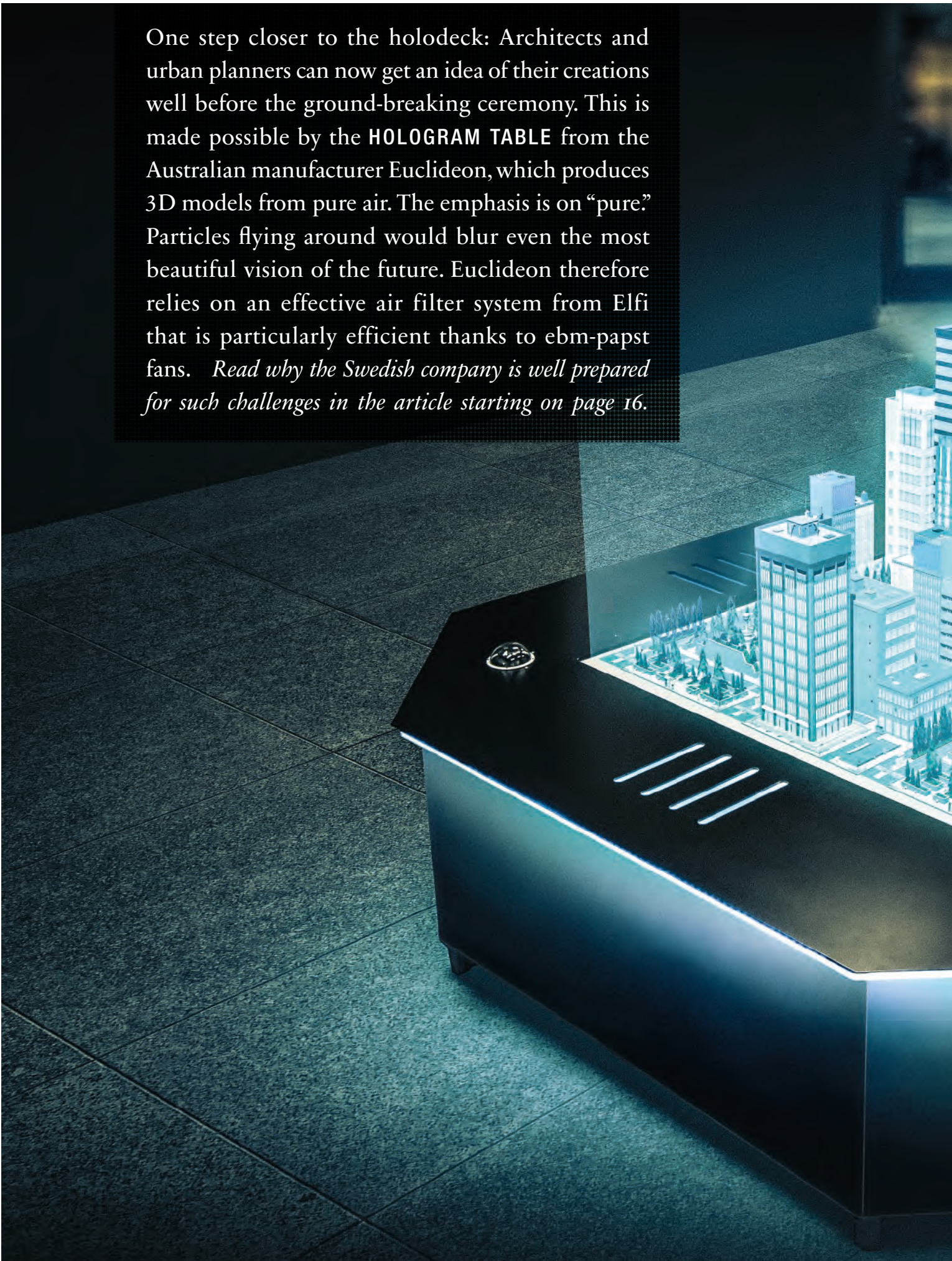




Mosquitoes won't be company to this party anymore. At least, if Pierre Bellagambi and Simon Lillamand, the managing directors of the French company **QISTA**, have their say in the matter. Their mosquito trap uses an axial fan to simulate the exhalation of carbon dioxide by a human. Once a female mosquito is lured by this trap, another fan pulls them into the device and catches them in a net. *Learn more about the invention here: [mag.ebmpapst.com/qista](http://mag.ebmpapst.com/qista)*



One step closer to the holodeck: Architects and urban planners can now get an idea of their creations well before the ground-breaking ceremony. This is made possible by the **HOLOGRAM TABLE** from the Australian manufacturer Euclidean, which produces 3D models from pure air. The emphasis is on “pure.” Particles flying around would blur even the most beautiful vision of the future. Euclidean therefore relies on an effective air filter system from Elfi that is particularly efficient thanks to ebm-papst fans. *Read why the Swedish company is well prepared for such challenges in the article starting on page 16.*









# A chilled-out cinematic experience

Opened in 1995, Century Square in Singapore is a six-story shopping mall providing a wealth of shopping, eating, and entertainment options. However, the mall had seen better days and was having difficulty keeping up with its inner-city competitors. With the new guidelines set by the government authority the mall operator decided to renovate the premises in 2018. The commissioned energy consultancy company Esco examined the premises in closer detail, including the cinema on the 5th story. The cinema was being cooled by

large AC fans on the roof, which resulted in high energy and maintenance costs. Mark Ng, Sales Manager at ebm-papst SEA, knew the perfect remedy: “We replaced the six AC fans with 24 EC fans in the FanGrid design,” he explained. “They are much more efficient and require no maintenance.” Cinema-goers have also benefited as the quieter fans produce less vibration, meaning they can hear even the faintest whispers from the big screen. *Read the whole story at [mag.ebmpapst.com/centurysquare](http://mag.ebmpapst.com/centurysquare)* ●





# “Digital products solve problems that analog products can’t”

With its GreenIntelligence label, ebm-papst is making a statement about digitalization. Thomas Sauer, Group Director for Digitalization and Electronics, explains what is behind it and what customers can expect from it.



Thomas Sauer is Group Director for Digitalization and Electronics at ebm-papst.

*What is the new GreenIntelligence label about?*

GreenTech has been a symbol of our holistic approach for years: green production, green products and sustainable use of resources. That’s still the case, but we’ve taken it a step further: GreenIntelligence is GreenTech plus digitalization. The new logo indicates to customers that a product includes networked EC technology, and in particular that they are getting added value that goes beyond the product itself.

*Just what does that mean?*

The focus is no longer on the products alone, it’s mainly on the data they supply. We’ve already had smart products with on-board electronics for some time, and we’ve been gathering data in our products for a long time for later viewing and analysis. Now connectivity is joining the mix. By networking our fans, we make their data accessible and useful to the user everywhere. That introduces new possibilities. Added value is created when digital products solve problems that analog products can’t.



*Is that already being applied?*

Yes. For example, we’ve developed our own cloud solution that we can use to acquire data from a network-capable product at any location worldwide and retrieve it to our data center in Mulfingen. Here we can see whether it’s running as it should or if it needs maintenance.

*Is predictive maintenance the main added value that customers can expect?*

It’s not everything, but it’s an important aspect. Let’s take the example of a residential ventilation unit. We can determine the

level of heat exchange and the power consumption to tell us whether the unit is running in its optimum range. This information is also available to remote users and provides many benefits for them, such as better air quality, longer system lifetime and improved service. Predictive maintenance also

ensures that the user can intervene in time before something happens that causes a system to fail completely. But they only have to intervene when it’s really necessary.

*What other added value is there beyond that?*

We can achieve greater energy efficiency with connectivity. We’ve already achieved very high efficiency with motors, electronics and aerodynamics. There’s no longer much room for improvement there. Products offer the greatest potential for energy savings in their applications, such as running only when they’re needed, and then only with the required output. ●

IF YOU HAVE OTHER QUESTIONS ABOUT THIS TOPIC, YOU CAN ADDRESS THEM TO THOMAS SAUER:  
**Thomas.Sauer@de.ebmpapst.com**



# CONWAY'S TRAVELS







Newcastle, Belfast, Coleraine—Joe Conway traveled around Ireland's green countryside and lively cities for several months. He was targeting the country's stores.

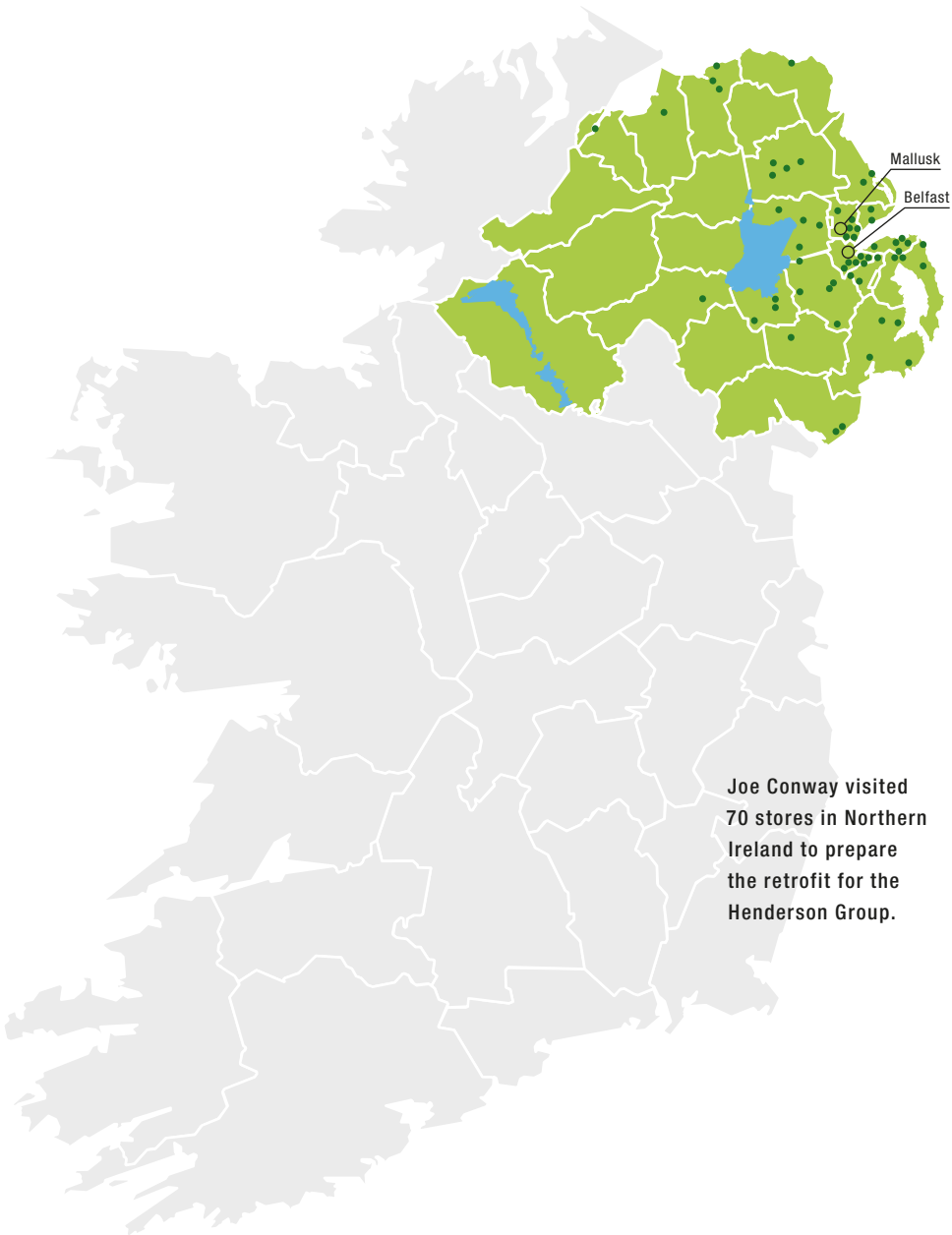


COMPANY

Henderson Group

LOCATION

Mallusk, North Irland



J

Joe Conway’s head is deep inside a freezer cabinet. He has been counting all the fans and every single light fitting. Then he comes out, writes down the numbers, and pulls the folding rule that he uses to measure the surfaces in the frozen foods section from his pocket. The commercial manager of the Cross Group is examining the SPAR store in Belfast; just like he previously did in Newcastle and Coleraine. He has been examining Northern Ireland’s stores like this for several months.

Conway has a major project underway: in only three months, the cooling technology expert must replace 2,000 fans and just as many light fittings in the freezer cabinets in 70 of the Henderson Group’s stores. The company is one of the largest retail brands in Northern Ireland. In addition to the company’s own 85 stores, it has the SPAR and EUROSPAR brand franchise for the country, comprising over 450 stores. The main challenge: “We

have to keep the stores open while replacing the parts,” said Conway. “This is why we had to create the optimal plan. We didn’t want to disturb the store customers.”

*Impressive savings potential*

But first, back to the beginning: The retrofit was Dr. Glen Crumley’s idea. He is the Henderson Group’s energy manager. “Part of my job is to propose a measure for lowering the Group’s energy costs and carbon emissions every year,” Dr. Crumley said. When he met Tony Wright from ebm-papst UK at a conference in London, he learned about a new option. “Wright’s presentation there was about how much energy you can save by replacing AC fans in cooling systems with EC fans,” he added. Since cooling systems consume between 30 and 60 per cent of the energy in supermarkets, he considered





Conway sets off in Armagh (top). When he arrives at the store, he counts every light fitting in the fridge and takes a close look at the fans (bottom).







By replacing the fans and lighting in the freezer cabinets the Group saves over 200,000 euros per year (top). Dr. Glen Crumley, Energy Manager of the Henderson Group (bottom left) is particularly pleased about this. He had the idea for the retrofit.





**“I went to each of the 70 stores myself. This was the only way to pinpoint the project’s scope.”**

JOE CONWAY — COMMERCIAL MANAGER OF THE CROSS GROUP

it a key point of departure. “I was impressed by the numbers, but also appreciate the quality of the products and ebm-papst’s guarantees and company history. So I gave the order for the retrofit to Cross Group and required them to procure the EC fans from ebm-papst,” he explained. Alongside the fans, they were asked to replace all the light bulbs in the freezer cabinets with LEDs.

#### *Nothing left to chance*

After management at Henderson gave its approval, the Cross Group kicked off the planning phase. “I received information from the store managers,” said Conway. “But I couldn’t use it for detailed planning. So I went to each of the 70 stores myself. This was the only way to pinpoint the project’s scope.” The Cross Group trained six subcontractors to do the replacement work. Conway supplied them with plans. “The plans told them where they should park to avoid any inconvenience to store customers and how they had to behave inside the store and deal with customers, for example,” he said. But they also specified how many fans had to be put in which refrigerated display cases, which ones needed adapters and which precautionary safety measures they would have to take.

“The Henderson Group’s stores are very busy, people are always entering and leaving. We didn’t want to get in the way.” Since the Cross Group needed the assistance of the store employees, who had to empty the refrigerated display cases before their arrival and fill them immediately after the work was completed, the work could only be done

during the day, although some of the Group’s stores are open around the clock.

After a six-month planning phase, the subcontractors started retrofitting. They replaced between 20 and 60 fans and light fittings per store, which took anywhere from a few hours to a maximum of two days. “The retrofit went smoothly,” said Dr. Crumley. “They did not have to do any mechanical work on the unit bases and the fans could be replaced one-to-one. Only 15 percent of cases required an adapter. And for the most part, the stores could operate normally.” After three months, the retrofit was completed.

#### *Savings for the bottom line and the environment*

The Henderson Group is really saving now. The retrofit reduced the fans and lights energy usage by 70 percent. As Conway explained: “The EC fans are not only more efficient, they give off less heat—which translates into less cooling. The savings are tremendous.” In total, the old AC fans consumed almost 800,000 kWh per year, but the new axial EC fans use just under 150,000 kWh. By replacing the fans and lighting the Group saves over 200,000 euros per year. The investment will be paid for after 20 months and the new fans are more reliable, quieter and have longer service lives.

The environment also benefits: After the retrofit, the Henderson Group emitted 550 less tonnes of carbon per annum. “The project was definitely one of our largest and most complicated,” said the commercial manager. “But it was well worth the effort.” ●



COMPANY

**Elfi Elektrofilter AB**

LOCATION

**Alingsås, Sweden**





# Staying in for fresh air

The Swedish company Elfi develops and produces air purifiers that not only free the air indoors from harmful particles but also inspire high-tech visions.



What are you doing right now? Correct, you are reading. And what else? Was your answer, “nothing?” Patrik Tedsjö is right when he says: “We breathe without really thinking about it. And we take clean air for granted.” When Tedsjö is sitting on the sofa at home in Mariestad or taking in Sweden’s nature at the weekend, he often breathes in and out consciously. But the 50-year-old’s work routine also focuses on clean air: Tedsjö is the CEO of Elfi.

The company’s 30 employees develop and produce air purifiers and air purifying systems. From tranquil Alingsås, just 50 kilometers to the north-east of Gothenburg, thousands of units are currently shipped to ten countries—and growing. The public has finally become aware of air quality. “Basically, our units are in use where there are problems with the air,” Tedsjö said. “Twenty years ago, nobody thought about it. Today, clean air is a major concern.”

#### *A poisonous cocktail*

According to a current World Health Organization report, nine out of ten people breathe contaminated air—and not only those who are moving around outside, on the streets of a major city. In homes and offices, all sorts of stuff is flying through the air and not only literally taking the breath away from people with allergies. In addition to dust, pollen, spores and bacteria, lots of volatile organic compounds

(VOC)—substances used in paint, personal care products or cleaning agents, for example—are in the air we breathe. And these products are based on chemicals and oil. In interiors, they evaporate quickly and can combine with other gases to form compounds such as ozone or fine dust particles. In the *Science* trade journal, scientists have warned about an insufficiently researched “interior chemical cocktail.”

Poorly researched perhaps—but not inevitable. “Our air purifiers can filter up to 99.98 percent of the particles from the air, eliminating odors and gas in the process,” said Tedsjö. Their effectiveness is based on the patented electrostatic filtering method that Elfi air purifiers and the affiliated Woods consumer brand work with: ionization. The particles in the air that the unit sucks in have a slight positive charge. The negatively charged filter surface attracts the ionized particles. Without loss of pressure, the air flows through the HEPA (high-efficiency particulate air) filter.

#### *Shhh, the children are breathing*

Tedsjö says that his employees’ expertise is not the only thing that makes the air purifiers so effective: “Fans from ebm-papst are perfect for us.” To enable the air to flow through the purifier, Elfi uses 12-volt DC centrifugal fans with speed regulation. “They are the key to our air purifiers’ low energy consumption and low noise emission,” said Tedsjö. Neither benefit





**“Our air purifiers can filter up to 99.98 percent of the particles from the air, eliminating odors and gas in the process.”**

**PATRIK TEDSJÖ**

CEO OF ELFI ELEKTROFILTER

should be underestimated—think about children sleeping through the night or parents concentrating at work, whether in an urban open office situation or at an oil refinery office.

Lars Kyrklund also praises the fans from ebm-papst as being “unbeatably efficient.” The freelance technical consultant develops air purifier systems for Elfi and until recently, worked on a project showing that particle-free air inspires both human lungs and visions of the future. Kyrklund integrated an Elfi air purification system into the hologram table from Euclidean, the Australian company.

#### *Clean air for holograms*

This high-tech table creates 3D models such as architects’ designs. But it only works in the absence of particles that could cloud the projection. “I selected an Elfi air purification system for the table because it is extremely energy efficient. The amount of clean air that just one watt delivers is amazing—and of course the design is not the only contributing factor. The fans also play a major role. After all, the energy consumption level of an air purification system depends on them,” said Kyrklund.

Kyrklund used the same fans for the hologram table that Elfi used for the air purifiers that are found in residential spaces. At home, Tedsjö has one in every room. As he is well aware: “There are no ‘good particles’ in the air.” ●

LEFT

One reason Elfi air purifiers are so quiet and efficient is DC centrifugal fans with speed regulation from ebm-papst.

RIGHT

Elfi CEO Patrik Tedsjö and employee Ramy Ibrahim examine an air filter before shipping it.





## COMPANY

Audio Note (UK) Ltd.

## LOCATION

Brighton, England

# GOING ROUND

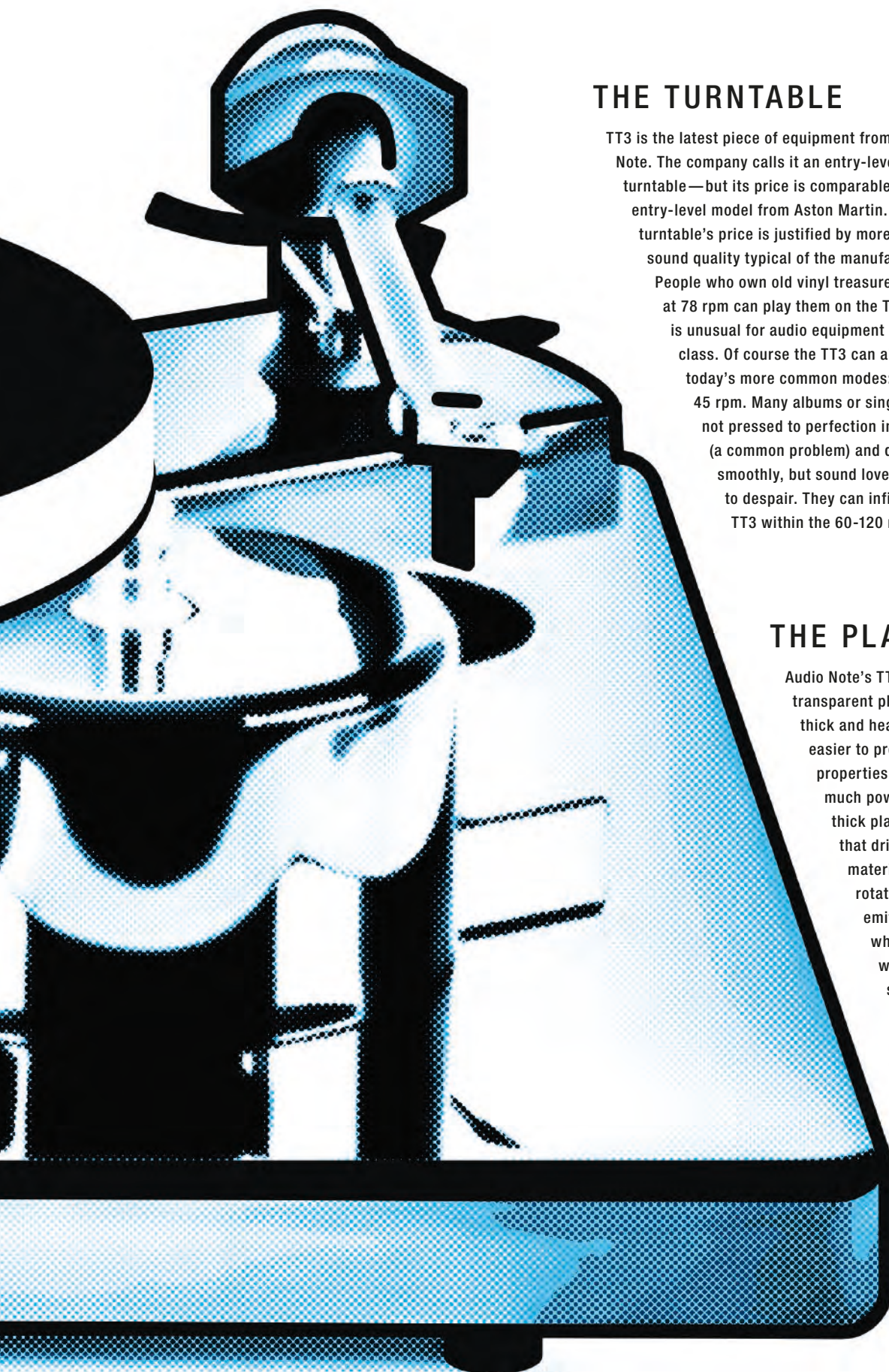
The turntables from Audio Note are the ultimate in the hifi market.

TT3, the latest model, uses three motors to drive the platter and ensure a premium sound experience.

## ABOUT AUDIO NOTE

Audiophiles and other fans of premium sound are aware of the name Audio Note—you can tell by their reactions upon hearing it. They range from a nod to genuine tears of joy. One of the elite members of the audio world, the British hifi manufacturer has a host of loyal fans. This is primarily due to the acute hearing of Peter Qvortrup, who founded the company in the 1990s. He releases all products personally in his sanctuary in Brighton before their market launches. His personal attention pays off: Audio Note has around 40 employees and generates an annual turnover of five million euros.





## THE TURNTABLE

TT3 is the latest piece of equipment from Audio Note. The company calls it an entry-level turntable—but its price is comparable to an entry-level model from Aston Martin. The turntable's price is justified by more than the sound quality typical of the manufacturer. People who own old vinyl treasures that play at 78 rpm can play them on the TT3, which is unusual for audio equipment in this price class. Of course the TT3 can also play today's more common modes: 33 rpm and 45 rpm. Many albums or singles were not pressed to perfection in the past (a common problem) and do not rotate smoothly, but sound lovers do not have to despair. They can infinitely adjust the TT3 within the 60-120 rpm range.

## THE PLATTER

Audio Note's TT3 features a lightweight, transparent platter. Normally, platters are thick and heavy because this variant is easier to produce and has good rotation properties. Once rotating, they don't need much power to keep them in motion. But thick platters have sound properties that drive the experts crazy. The thick material of heavy platters saves rotation energy so well that it is emitted in the form of sound waves when a record is playing. Sound waves that are lethal for good sound. Audio Note platters are made from ultra-lightweight polycarbonates that do not generate any interference whatsoever. The rotation energy stays where it belongs: below the platter, right in the drive(s).

## THE MOTORS

Three compact motors drive the TT3's platter when a record has to rotate beneath the needle. Their combined power is required to keep the 900-gram platter at a constant speed. Due to their low noise emission, Audio Note decided to use VarioDrive-series drives from ebm-papst. They also feature high efficiency, compact dimensions, and infinite adjustability.



COMPANY  
Shoprite Checkers (Pty.) Ltd.

LOCATION  
Cape Town, South Africa

# A Quiet Kind of Freshness

South African supermarket chain Shoprite relies on ebm-papst AxiCool fans in its new distribution center in Cape Town.



Shoprite processes products from about 500 suppliers at the Cilmor Distribution Centre on the outskirts of Cape Town.



W

When Bobotie is served anywhere in South Africa, fans from ebm-papst have done their part to make it happen. At least when the ground beef for the traditional casserole comes from Shoprite—which is very likely. With almost 150,000 employees and around 2,700 stores in 15 countries, Shoprite is the largest supermarket chain on the African continent. The purchases of 35 million people roll down the belt toward the group's cash registers every day—at Shoprite or one of the Checkers markets that also belongs to the group.

People who place the ingredients for Bobotie or other perishable merchandise like eggs, dairy products, etc. in their shopping carts probably have no idea how sophisticated the technology

that keeps them fresh is. Because few know where the products were before they landed in the display counter: in the Cilmor Distribution Center (DC) on the outskirts of Cape Town.

#### *Distribution center of wonders*

In the new building that measures 144 x 123 meters, Shoprite opened a distribution center at the beginning of 2018 that handles goods from around 500 suppliers. "The distribution center is not only impressively large," said Steven Friedmann, the head of sales for ebm-papst South Africa. "Those responsible at Shoprite wanted it to be the most progressive, energy efficient center of its kind."





*Challenges: Noise and energy costs*

At the highest point of its distinctive, curved roof, the Cilmor DC measures 22 meters. And it hides a clever cooling system. Previously, the merchandise was stored in different distribution centers due to varying temperature requirements, but the Shoprite Group aimed to process all of the products under one roof. To achieve this, Shoprite divided the Cilmor DC into three zones. Two have -28 °C freezers measuring 4,500 square meters each and the third 12,000 square meter cooling zone holds the temperature at 1 °C.

Companies who build facilities like this are faced with a variety of enormous challenges, but one in particular stands out. “Noise!” said Hannes Steyn, the director of GEA Refrigeration Africa (Pty.) Ltd., the company that is responsible for the entire cooling system at Cilmor DC. Steyn explained that due to the highly reflective surfaces and many fans, a noise level results that makes it unpleasant to work in the facility. And the region is known for its energy scarcity and rising energy costs. As Friedmann explained: “As a result of failing to invest in new, higher-output power plants, the demand for electricity in our emerging market is greater than the supply. A constant supply of electricity is not always guaranteed. And the increase in electricity costs is partially due to the rapid expansion of our electricity grid.”

To master these challenges, GEA Africa specified criteria that the fans for the evaporators in the distribution center had to fulfill. They were required to be efficient and have a maximum noise level of 48 dB(A)—no louder than a quiet night in a major city—and have a reach of at least 28 meters with 100% speed control.

This is where the fans from ebm-papst came into play. To be precise: 176 AxiCool EC fans in size 800 deliver strong air circulation above the heat exchanger surfaces of the evaporators. Equipped with streamers for improved air throughput and with an impeller design that keeps the noise level low, AxiCool fans meet the key requirements for use in the distribution center.

*The temperature sets the speed*

“The fans typically run at reduced speed. That has a significant impact on the noise level and energy consumption. When it comes to air flow and reach, they exceed our expectations,” said Steyn. The speed depends on the air temperature. When the required temperature is reached, it decelerates. For a warehouse facility that seldom operates at full capacity, this translates directly into savings—of money and energy. AxiCool EC fans feature infinite speed regulation. That saves energy. As Steyn also pointed out, AxiCool fans are easy to install. In summary: “We are extremely satisfied with this product.” ●

Are you hungry for South African food? At bottom right is a recipe for Bobotie.



South African specialty: Bobotie

**INGREDIENTS (FOR 4 SERVINGS):** 500 g ground beef, 1 bread roll, 2 onions, 4 garlic cloves, 3 eggs, 50 g raisins, 2 tbsp mango chutney, 50 g almond flakes, 125 ml milk, 2 bananas, 1 tbsp lemon juice, nutmeg, 3 tsp curry powder, black pepper and salt

**PREPARATION:** Soak the bread roll in water and press it out well // Add the roll, finely chopped onions and garlic, raisins, mango chutney, almond flakes and an egg to the meat and mix well // Season with salt, pepper, 2 tsp curry powder and the lemon juice // Put the meat mix in a greased casserole dish, spread it out smoothly and bake it in a preheated oven at 220 °C for 20 minutes. While the meat mixture is baking, mix the milk and the other two eggs and season with salt, nutmeg and curry // Peel and slice the bananas and distribute them over the casserole. Pour the egg sauce over the casserole and bake for another 15 to 20 minutes



# » *Sustainability Is in Our Genes* «

Turkey relies on the EU Ecodesign directive. Since 2018, the minimum efficiency standard has also applied to the condensing boiler market. emas, the Turkish market leader, is not worried about the regulations being tightened.

COMPANY

Emas Makina Sanayi A.Ş.

LOCATION

Manisa, Turkey



## “We at emas support directives whose goal is to reduce energy consumption or emissions.”

FIKRI NEĞİŞ — HEAD OF RESEARCH AND DEVELOPMENT AT EMAS



A hot spot of Turkish industry is located around 20 kilometers to the north east of Izmir. In the huge industrial zone of Manisa, Emas Makina Sanayi A.Ş. (emas) and over 150 other companies manufacture their products. emas is the biggest condensing boiler manufacturer in Turkey and with its ECA brand, has also been a leader in the heating and cooling system market since 1985. And emas is now going international: China, Russia, the Middle East, Greece, Germany, and Great Britain. Innovations are a key driver of the expansion. At emas, Fikri Neğiş, the head of research and development, is responsible for this effort.

*What role does sustainability play for you?*

It is very important to me to act sustainably. That was one of the reasons I decided to work at emas. For me personally, the company's values are an important guide and for both me and my colleagues, they are an inspiring goal.

*What are your company's values?*

Social responsibility is one of the two key values at emas. Our interpretation of this is: conserving natural resources and treating the environment with respect. Sustainability is in our genes. This is why at emas, we also support directives whose goal is to reduce energy consumption or emissions. We believe in continuous improvement of the environment and the contribution to realizing this goal made by highly efficient products.

*Recently, you had to deal with implementing a directive like that.*

To successfully enter the market in the European Union, Turkey adopted its rules and regulations early on—including the Ecodesign directive. It has applied to instantaneous water heaters in Turkey since January 2018. But we are not worried about implementing it, since energy efficiency has played an important role at emas for a long time.

*How exactly did you implement the directive?*

We concentrated on two topics when implementing the ErP Directive: technical implementation and planning. The technical side primarily involved determining our efficiency classes. At the first step, we changed all the circulation pumps in the boilers to the high efficiency pumps according to ERP lot II. As a second step, we phased out our non-condensing combi boilers according to ERP lot I. Then, we provided the printed labels, inside packaging of condensing boilers and gas water heaters, to end users and the document version to all customers on the Internet. At the same time, we enabled the online calculation program of heating systems with additional heat sources or accessories to determine package system efficiency (boiler+controller+solar system+additional heat sources) and to create a label for the package system.

*We still haven't talked about the second value...*





Fikri Neğiş received his engineering degree from Middle East Technical University, one of the top universities in Turkey. His master's thesis was about material sciences and energy storage. Neğiş' entry-level position in the automotive industry led to a job in heating technology. He worked as an expatriate in Portugal for three years. After 16 years, he began working at emas. Currently, he heads a 29-person R&D team.

**ELGINKAN HOLDING** Emas is part of Elginkan Holding Company Stiftung, which was founded in 1951. It embraces the mission of following cutting-edge technology while taking its effect on humans and the environment into consideration and always focusing on the quality and reliability of its products and services.

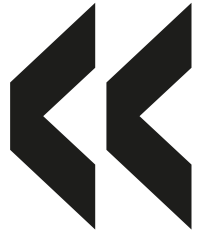
It requires 100% customer orientation. To us, concentrating on customers means recognizing their expectations—and meeting them with innovative products that deliver more than anticipated. Currently, we are working to expand our range of high-quality products, for example. Customer demand in this segment is high.

*Could you mention a few examples?*

The newest products in the ECA portfolio are Proteus Premix and Felis. The first one is a condensing boiler in the output range of 24 to 35 kW. Felis is a central high-performance condensing boiler from 65 to 150 kW. By the way, we rely on gas blowers from ebm-papst in both

FIND MORE PICTURES AT:

[mag.ebmpapst.com/emas](http://mag.ebmpapst.com/emas)



boilers. These high-performance components support our effort to continuously raise our products' efficiency. And our customers warmly welcome Proteus Premix due to its low noise generation. We are convinced that the gas blower plays an important role in noise reduction.

*Why did you decide to go with ebm-papst?*

We have been working closely with ebm-papst since 2004. Several factors played a role in our choice. First, we knew that ebm-papst has a reputation for high quality and reliable components. Second, ebm-papst also follows a sustainable corporate philosophy that matches our convictions. In our daily collaboration, we experience fast, transparent answers to our questions and requirements. For example, when we had a question about quality that was only indirectly related to ebm-papst, our colleagues there reacted quickly and provided useful support. We were very impressed.

*Do you also use new components from ebm-papst in your pioneering, innovative products?*

We test all components for perfect function and satisfactory service life in their applications. Over the years we have had very good results with the gas blowers from ebm-papst. That is why we are always ready to use further development or innovative products: they fulfill our mission of exceeding expectations. After all, top quality and innovation are our main focus. ●







COMPANY

Novuqare Pelvic Health B.V.

LOCATION

Rosmalen, Netherlands



# Masters of the golden triangle

In hospitals and practices worldwide, doctors, dentists and veterinarians use medical equipment from Novuqare, a Dutch company with only 18 employees. Its secret to success is balancing the three elements of innovation, production and close customer contact.



“We’re a step ahead of big companies.”

IWAN VAN VIJFEIJKEN

MANAGING DIRECTOR OF NOVUQARE

The two most important medical products made by Novuqare are MAPLe, a device for diagnosis and treatment of pelvic floor problems, and a medical sealer for sterile packaging of medical instruments. Novuqare is also a preferred supplier for Philips Healthcare. “We produce various devices as a contract manufacturer for the medical sector,” says managing director Iwan van Vijfeijken. “Thanks to our medical certification, we are allowed to produce such high-quality medical devices.”

*“We are entrepreneurs”*

Novuqare listens carefully when doctors comment on their professional needs. Such comments serve as input for the development and production of new medical products or the improvement of existing ones, which takes place in cooperation with partners such as the Swedish company Getinge. That also includes launching new products. “We are entrepreneurs,” says van Vijfeijken. “We want to make a contribution to the improvement of medical services. We do that by working according to the triangle principle. We combine our triangle of innovation, production and direct customer contact with the speed, efficiency and high standard of quality that we as a small business can provide. This golden combination is the recipe for our success and puts us a step ahead of even big companies. They may also operate according to the triangle principle, but can’t do it as quickly and efficiently as we can. Processes in big companies often go somewhat more sluggishly, and they’re less willing to take the risks involved in developing new products. But we’re willing to do that without further ado.”

MAPLe and the sealer for medical instruments are examples of medical products that were developed at Novuqare according to





the triangle principle. Once a product is on the market, thoughts are made about innovative ways to improve or refine it. “Our employees are in regular contact with customers worldwide and hear from them about their experiences with our products. We implement that feedback in our products as quickly as possible, and we do all of this in our own production facility. That way we keep control over quality and keep on improving the product. We’d rather do one thing right than ten halfway.”

*Maybe not attractive, but...*

The medical sealers are Novuqare’s bestsellers. Hospitals and dental and veterinary practices can use them for sterile packaging of their medical instruments. “It may not be the most attractive product we make, but it’s indispensable for medical facilities and it’s the best of its kind,” says van Vijfeijken. “The unit is compact, light and reliable. It practically always works. And in the end it has to, because a hospital can’t work without sterile packaging for its materials. Besides that, the sealer is very user-friendly and works noiselessly.”

*Super-quiet drives*

The sealer is so quiet because of its integrated ebm-papst motor. According to van Vijfeijken, the motor is its most important component. “The motor ensures that the sealer serves its purpose—sealing—as well as possible, quietly and with top quality. The packaging is sealed well but not too tightly, which is often precision work. The motors from ebm-papst are very reliable and practically never fail.” Novuqare has been collaborating with ebm-papst for more than ten years. Back then the company’s first sealer left the production line in

Rosmalen. “The cooperation was outstanding from the beginning. There are no complicated communications channels. If a problem comes up, it gets solved right away. Thanks to its technical expertise and high quality standards, ebm-papst is the leader in its sector. Things like innovation and sustainability also have high priority there. That’s what we have in common.”

Novuqare has the world at its feet and many opportunities for growth. “For the time being, we can’t lean back yet,” says van Vijfeijken. “We’ve taken a new path with our medical sealers; now we’re also selling them directly to customers without middlemen. Demand for our sealers is increasing worldwide. That’s why we decided to take this step.” Van Vijfeijken also sees many opportunities in the coming years in the development of new medical products and further expansion of the relationship with Philips. “But I consider it important for us to remain flexible enough to be innovative and committed while controlling speed, efficiency and quality. After all, that’s the foundation of our success.”

*Proud of their work*

What van Vijfeijken considers most important is that his employees are still proud of their work. “We keep our employees closely involved in the processes. They are often present at the birth of new medical products, so for them every product feels like their own. The team may be small, but it has a great team spirit. That’s good, and it’s important for reaching our goals. Am I proud? More than that. Sometimes I wonder how we do all that we do with only 18 employees. Everybody here puts their heart and soul into their work. That makes me very happy and is something we’ll need to keep up even as the company grows.” ●



**LEFT:** Managing director Iwan van Vijfeijken takes a close look at the development of new products.

**CENTER:** An ebm-papst drive ensures that the medical sealer is precise and super-quiet.

**RIGHT:** In production, only top quality matters at Novuqare.



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## Publisher

ebm-papst Muldingen

GmbH & Co. KG

Bachmühle 2

74673 Muldingen

Germany

+49 7938 81-0

Info1@de.ebmpapst.com

www.ebmpapst.com

## Responsible for content

Stefan Brandl

## Editor-in-chief

Kai Halter

## Project co-ordinator

Katrin Lindner

## Editorial staff

Die Magaziniker GmbH

magaziniker.de

## Layout and production

Die Magaziniker GmbH:

Steffen Beck,

Christoph Kalscheuer,

Julian Stutz,

Gernot Walter

## Art direction

Gernot Walter

## Authors

Steffen Beck,

Eveline Blohmer,

Stefan Brandl,

Karin Herczog,

Tina Hofmann,

Rinske van Kasteren,

Sebastian Stamm,

Julian Stutz,

Anton Tsuji

Markus Weingart

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In a Local Interconnect Network (LIN) bus, the data transfer time is an important parameter for the communication between master and slave devices.

$$t_{\text{Frame\_Max}} = 1,4 \times t_{\text{Frame\_Nom}} = \left[ 1,4 \times (n \times 10 \times 44) \right] \times t_{\text{Bit}}$$


In the automotive sector, the LIN bus is a long-established communications solution for networking sensors and actuators and their control devices. In view of the success of smart home applications, the serial fieldbus system is gaining rapidly in importance in the heating sector as LIN bus communication provides a lean solution for connecting components such as pumps or gas blowers and thus making smart condensing boilers possible.

The LIN bus is a single-master, multi-slave system. The master—in a condensing boiler, the electronic controller—determines when the slave—for example, the blower—should provide data or carry out commands. This takes place at cyclical intervals according to a timetable kept in the master. This clear schedule defines which information is to flow and when. For our gas blowers, we recommend retrieving the data relevant to control systems, such as the speed, every fifty milliseconds. For data that do not change so often, such as temperature or power consumption, longer intervals are sufficient. For defining the schedule, that makes it important to know the data transfer time for the various information packets. This is similar to planning in production, where it is also necessary to take timing into consideration when sequencing the individual steps in a process.

How long does it take to transmit a data packet? To answer this question, it helps to take a look at the typical structure of a LIN message (see example). In the LIN bus, it may include a maximum of 64 bits. But this information is not enough to calculate the transfer time. A so-called “overhead” is also needed, because before data retrieval starts, the master sends synchronization pulses to forewarn the slave so it can adjust to the master’s clock rate. In addition, a packet identifier (PID) is sent with a checksum for every transfer to announce the data packet’s contents and verify whether the data are transferred correctly. On top of that, a safety buffer of 40 percent is added since, as in production, sometimes a step can take longer than usual. But the production plan must not be allowed to get mixed up because of that.

The maximum data transfer time is calculated from the formula above. The term  $t_{\text{Frame\_Nom}}$  is the time required to transfer the data packet with the content information including overhead. It is calculated from the number of bytes multiplied by ten. This factor is comprised of the number of bits per byte (eight) and a start and a stop bit per byte. The number of bits in the overhead is given as 44. The parameter  $t_{\text{bit}} = \text{baud rate}^{-1}$  designates the baud rate, a unit that

expresses transmission speed. In a LIN bus, bit rates of 19.2 kbit per second are typical. For this value, a bit transfer time of  $t_{\text{bit}} = (19.2 \text{ kbit/s})^{-1} = 52 \mu\text{s}$  results. So a LIN message with 64 bits has a maximum data transfer time of about nine milliseconds. ●



**EXAMPLE OF A LIN MESSAGE FOR A GAS BLOWER**

Blower_epL_IDC_GET PID11		
revolutions per minute	0	16 Bit(s)
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
sensor data	16	16 Bit(s)
	17	
	18	
	19	
	20	
	21	
	22	
	23	
	24	
	25	
26		
27		
28		
29		
30		
31		
warning present	32	1 1
error present	33	
status signals	34	12 Bit(s)
	35	
	36	
	37	
	38	
	39	
	40	
	41	
	42	
	43	
	44	
	45	
response error	46	1
motor power	47	9 Bit(s)
	48	
	49	
	50	
	51	
	52	
	53	
	54	
	55	
	56	
ambient temperature	57	8 Bit(s)
	58	
	59	
	60	
	61	
	62	

Markus Weingart,  
Head of Department Electronics,  
ebm-papst Landshut



# Wanted: young techies

ebm-papst uses partnerships on many platforms to find skilled young talent. One such platform is “Jugend forscht,” whose regional contest has been organized by the company’s Mulfingen headquarters for 20 years.



Lauritz Abel (left) and his schoolmate Kevin Erdmann took second place at the national level in the “Jugend forscht” contest for their anti-stick coating for trucks.



A

About 400 young people are currently in training at ebm-papst locations in Germany. In Mulfingen alone, they can choose from twelve professions and nine dual study programs. But it is becoming increasingly difficult to recruit young people in rural areas. "Applicant numbers for training positions in Mulfingen have been falling steadily, from 1,000 in 2013 to less than 500 now," says Bernd Ludwig, who has been in charge of training at ebm-papst for 25 years. "And most of them are interested in commercial rather than scientific or technical professions." But technical talent is indispensable to safeguard the future for the innovative world market leader.

So when the organizers of "Jugend forscht," a German science contest, approached ebm-papst more than 20 years ago about sponsoring the contest for the Heilbronn-Franconia region, group management wisely approved the request.

A current example is Lauritz Abel, who has been with ebm-papst as a trainee since September 2018 thanks to Jugend forscht. He and his schoolmate Kevin Erdmann took second place in the "workplace" category at the national contest with their anti-stick coating for deicing truck tarpaulins. "Even as a kid, I was interested in all kinds of technical stuff, and later I repaired old tractors myself," says Abel. While the event was still in progress, Bernd Ludwig spoke with him about his training prospects at ebm-papst.

Lauritz Abel chose a cooperative study program offered by Heilbronn University and leading regional companies since 2000. "First I'm getting two years of training to become an electronics technician at ebm-papst, then I'll study automation in Künzelsau for a bachelor's degree." So theory comes after practice.

But whether student or trainee, Bernd Ludwig and his team make sure that all 70 to 75 Mulfingen newcomers per year can intensively put their skills to use and improve them from day one. "It's important to us that our young employees are quickly able to work independently and take on responsibility," he says. On their own, the trainees for example organize informational events about training in the company and job applicant training at schools. "Peer-to-peer contacts are especially valuable," says Bernd Ludwig. "Of course the kids are more willing to talk to people close to their own age than with gray-haired men in suits." ●



**"Our young employees are quickly able to work independently and take on responsibility."**

**BERND LUDWIG**

TRAINING SUPERVISOR  
AT EBM-PAPST

The youth contest for natural sciences and technology started in 1965 with about 250 entrants. Today there are well over 10,000 per year.



LEARN MORE ABOUT EBM-PAPST'S  
YOUTH RECRUITING PROGRAM IN THE  
FULL VERSION OF THE ARTICLE AT  
[mag.ebmpapst.com/youngtalents](https://mag.ebmpapst.com/youngtalents)





# On-the-spot support Down Under

In May 2018, ebm-papst Australia and New Zealand (A&NZ) opened the Centre of Excellence in Melbourne. Customers benefit from products that are perfectly tailored to their requirements and an even better service on their doorstep.

Technical expertise, customer service and reliable products are three of the attributes that customers appreciate about ebm-papst. The Centre of Excellence at ebm-papst Australia and New Zealand, which was opened in May 2018, concentrates these capabilities in one place. It consists of a research and development facility, a fan test stand certified according to the ISO 5801 standard, a product analysis department, and a development department that specializes on control solutions.

“The Melbourne subsidiary now has the facilities for more extensive product testing and development as well as for performing more in-depth product analyses,” explains Design Manager Alexandra Gray. “The Centre of Excellence gives us the facilities and designated working area to develop products specifically tailored to the mechanical and software requirements of our customers.” Alongside the fan test rig for determination of air performance and power curves, our engineers have test cages at their disposal for safe testing, as well as an electronics station with which they can reprogram the rota-

tional speed. Air flow, noise, and electrical system testers are also available. “We have already been successful with locally developed products in the past, for example with the fan range for the agricultural market. The new Centre of Excellence allows us to increase these local capabilities,” says Gray.

The Centre of Excellence also provides the tool for more in-depth failure analysis. As our local team is now better equipped, there is a reduced need to send defective fans on a 14,500-kilometer journey to Germany. That saves a lot of time and money. “Recently we received a failed fan from a customer,” says Gray. “Our Centre of Excellence equipment enabled us to locally perform fan testing and failure analysis. We discussed the results and problem solving with the quality department in Mulfingen.”

The subsidiary aims to provide feedback to the customer within ten working days. Where major issues are involved that cannot be dealt with by technical support over the phone or in a video conference, the team will travel to the customer. ●





[ebmpapst.com/greenintelligence](http://ebmpapst.com/greenintelligence)

## THE ANSWER: 42

The new modular system for drives with an outer diameter of 42 millimeters provides a flexible answer to calls for different output, integrated encoder/brake, gearbox design, connectors or degree of protection. It enables the implementation of a suitable drive solution through the simple combination of several drive modules.



## TOP PERFORMANCE

A new gas blower extends our portfolio upward: The VG 450 provides heating outputs of up to four megawatts with a single compact blower, enough to heat several large buildings or entire housing developments. The VG 450 is not only our highest-output gas blower, it has the highest output on the market.

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## PRECISION FAN

More and more computing power is being generated on the same floor space in data centers. That places increasing demands on the precision air conditioners that cool the hardware, and on the fans installed in them, especially more air flow at lower output pressure. We have made corresponding modifications to our proven RadiCal fan: impeller width, intake area, blade contour and thickness were adjusted—while retaining the same overall dimensions.

[ebmpapst.com/radical](http://ebmpapst.com/radical)





# » *Residential ventilation has to be quiet* «

Thanks to its precisely controllable air flow, the RadiCal in scroll housing is ideal for residential ventilation.



Uwe Sigloch,  
Head of Product &  
Market Management  
at ebm-papst  
Muldingen, explains  
how the fan  
always moves the  
optimum amount of  
air while running very  
quietly.

*Mr. Sigloch, why did ebm-papst develop the RadiCal in scroll housing?*

Special fans that control both air intake and exhaust are needed for residential ventilation in both new and renovated buildings. Until now, fans with forward-curved impellers were used for central home ventilation units. But the proven RadiCal centrifugal fans with free-running backward-curved impellers deliver significantly better results for both efficiency and noise emission. Now we have combined the proven RadiCal fans with an aerodynamically optimized scroll housing for use in central home ventilation units, for which the products used must be extremely quiet.

*What specific benefits does RadiCal in scroll housing have for residential ventilation?*

The round outlet of the new scroll housing fits directly onto the ducts that distribute the air, reducing air flow losses in the duct system while also reducing the noise level

by up to 3.5 dB(A) when compared to a centrifugal blower. The disturbing blade passing noise of a backward-curved impeller in a living environment has been significantly reduced through the combination with the optimized scroll housing. The tonal proportion in the disruptive frequency range is reduced by up to 20 dB in comparison to conventional installation conditions.

*And how does the product ensure that the optimum amount of air is always moved?*

A vane anemometer positioned in the outlet of the scroll housing continuously records the actual air flow and transmits the data to the integrated central control electronics of the fan. These control electronics adapt the speed of the EC motor to the desired set-point value, thus regulating the air volume. This integrated volume constancy control enables effective home ventilation without an overpressure or underpressure occurring in the living space. This prevents humidity in the walls and unwanted cold air supply from outside. ●

YOU CAN FIND MORE PRODUCT INFORMATION ABOUT RADICAL  
IN SCROLL HOUSING AT: [ebmpapst.com/radical4home](http://ebmpapst.com/radical4home)



# RUGGED

RadiCal in scroll housing holds up even in extreme conditions such as dust and high humidity.

*Communicative*

The fan is controlled and its operating data read out via the Modbus RTU option.

$\pm 1\%$

(of final value) is the accuracy with which the air flow can be regulated for an air performance range of 50 to 500 cubic meters per hour.

3.5 dB(A)

quieter than a centrifugal blower:  
RadiCal with scroll housing.

# Sensitive

Optional connections enable integration of sensors for determining air quality.



WOULD YOU HAVE RECOGNIZED IT? ——— RADICAL IN SCROLL HOUSING IS IDEAL FOR RESIDENTIAL VENTILATION. TAKE A LOOK INSIDE! ↑

