02° 2014

mag°

all about ebm-papst

BLINK AND YOU'LL MISS IT

A team of British engineers make cooling more efficient with a successful retrofit — almost at the speed of light

“We are really moving the region”

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Building for the future

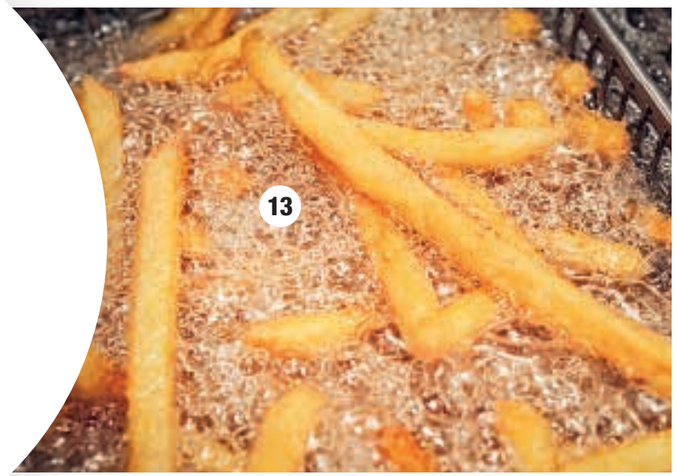
Thomas Borst

Managing Director
Sales and Marketing
ebm-papst Group

Dear readers, First of all, I would like to thank all our customers for the successful business year we have just experienced. Double-digit revenue growth and many new jobs created. These outstanding results that we presented at our press conference in June would not have been possible without the trust that you placed in us and without the many successful projects we implemented together.

But the innovations that we drove forward together were also important. Our cooperation with the Diamond Light Source particle accelerator in Oxfordshire (UK, page 8) is a good example of this.

Thanks to the commitment of our partners and the trust of those responsible in the success of high-tech projects, the facility will in future save 55 percent of the energy used in its cooling system. We want to build on this foundation of innovation and trust and grow together with you. Being prepared for future growth requires investment. And that is exactly what we are doing. As you read this, we are implementing major construction projects and expanding our capacity, therefore adjusting to the challenges our markets pose. Markets demand both shorter delivery times and greater flexibility. The expansions will help us achieve both of these, as we want to continue to provide our customers with the good service that they expect from us as a market leader. Enjoy reading!



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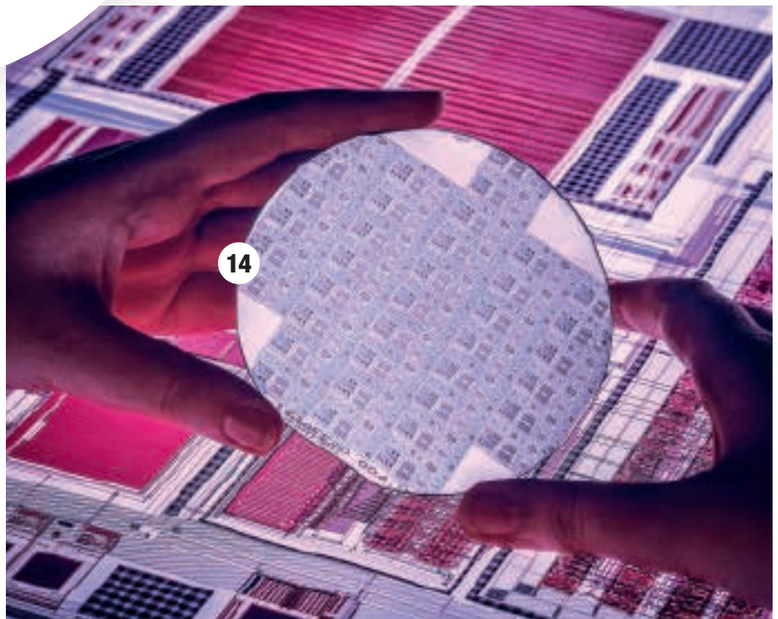

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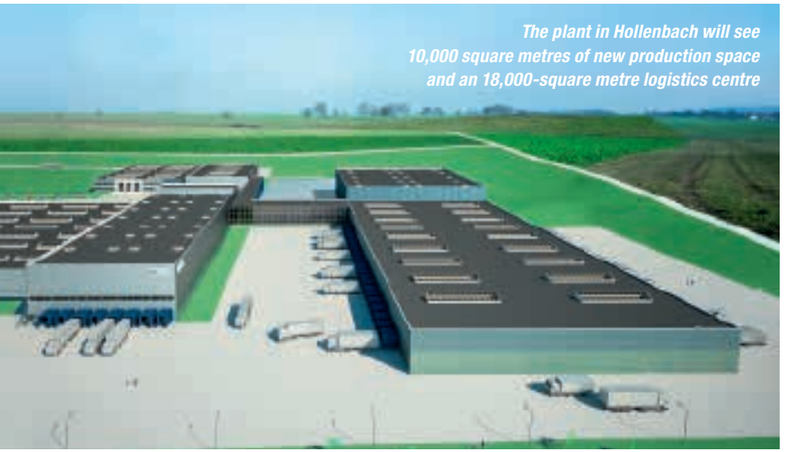


The plant in Hollenbach will see 10,000 square metres of new production space and an 18,000-square metre logistics centre

Building for the future

ebm-papst invests around 150 million euros in a logistics centre and capacity expansions

Growth requires space. To create this, ebm-papst is expanding its capacity. In Germany alone, the technology leader will invest around 40 million euros in the coming months. The company's planned total investment volume this year is in the region of 150 million euros. With the construction projects, ebm-papst is prioritising expansion of its production capacity and improvement in logistics. This will allow the company to offer its customers even better service in future.

The projects in overview

- At the plant in **Hollenbach**, the production area is being expanded by a total of 10,000 square metres. This will give ebm-papst capacity for producing larger sizes. An 18,000-square metre logistics centre is also planned by early 2016. It will centralise the outgoing goods logistics for the Mulfingen plant, as well as serving as a transit hub for Mulfingen and the group's European logistics.

- In **Landshut**, ebm-papst is building a new production facility. The 5,000-square metre building is to be completed in 2015 and used to expand the production of heating blowers and gas valves.

- By 2016, **St. Georgen** will have a new 4,000-square metre production plant. This building will be the new home for circuit board production.

- Our facility in **Vecsés** (Hungary) is being expanded by 6,000 square metres. Following completion in 2016, it will be used for fan production.

GreenTech worldwide

Making the world a greener place: Installing LEDs in Korea

Environmental awareness is a matter of course for ebm-papst. Our subsidiary in South Korea is therefore switching its lighting from halogen lamps to LEDs, helping them save around 170 kilowatt hours of energy. This also results in reduced waste, as the LEDs have a much longer service life than the halogen lamps. Those LEDs that are disposed of are less of a burden for the environment, as they do not contain any poisonous substances like quicksilver or lead.

WWW.GREENTECH.INFO

1.5 billion euros revenue

11.2 percent growth

6 percent of revenue reinvested into R&D

Innovation leads to record revenue

ebm-papst enjoys a strong 2013/2014 financial year

ebm-papst ended the past financial year with double-digit revenue growth. In addition to the domestic market, Asian and European markets contributed to strong growth. This growth is also reflected in the number of staff, with the business today employing 11,701 people around the world – 810 more than in the previous year. Rainer Hundsdörfer, Chairman of Board of Directors ebm-papst Group: "The model of our success is to secure our global technological leadership by investing heavily in research and development, recognise trends and continually develop new market standards."

What's happening in China, Mr Shiring?

Mark Shiring was the head of the ebm-papst subsidiary in Shanghai for four years. He is now returning to the USA as Executive Vice President. In an interview he talks about the most significant changes at the Chinese plant and explains the advantages for customers

Mr Shiring, what do you consider to be the greatest changes over the last four years?
Both Shanghai and ebm-papst China experienced a rapid rate of development during this period. Four years ago we had 1,000 employees, now there are 1,500. And at the same time we have almost doubled our turnover. This result was significantly impacted by market share growth and market expansion. Furthermore we restructured our sales team, set up our own development centre and expanded our production capacity.

How do customers benefit from these changes?
Slowly but surely the Chinese market is progressing towards energy-efficient products. With our locally-based development and production facilities we are able to offer customised solutions appropriate to the demands of the region. For instance, we developed a new EC fan for bus air conditioning systems specially adapted to local requirements in terms of noise level, service life and efficiency.

How do you rate your time in China?
Working in Asia was a valuable experience for me. You can only be successful there if you are prepared to put aside all you know about the western business world and adapt to a different culture. The Chinese market is faster-moving than almost any other – and the workforce responds equally quickly with creative solutions. I will really miss the people with whom I achieved so much, but will also have some wonderful memories to look back on. And I wish my successor Dr Zhijian Fan all the best!

Success against the clock: James Cooper from ebm-papst, David Japp from Cinque Energy Solutions, Phil Taylor from Stulz and Lee Walters from Diamond Light Source

Diamond Light Source is a top-class research facility

MAKE IT QUICK

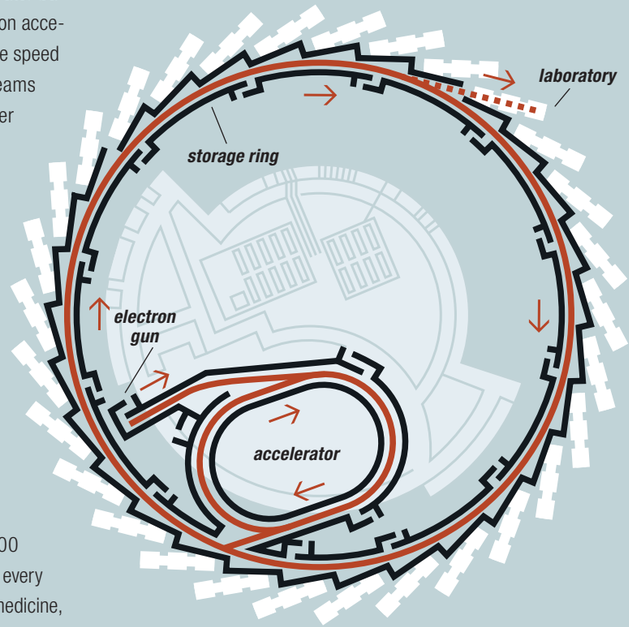
At Diamond Light Source, it is not just light that moves quickly. The upgrade to efficient EC fans for cooling sensitive technology also progressed at the speed of light

Every year, Diamond Light Source, a synchrotron in the British county of Oxfordshire, hosts around 3,000 scientists researching highly complex projects (see box on page 10) in areas like medicine, archaeology, mechanical engineering, biology or chemistry. They all use light emitted by the electrons that are sped around the research facility's massive storage ring at nearly the speed of light. "Cutting-edge research happens here every day, so it is important for us to always keep the technology up to date as well," says Lee Walters, Maintenance Manager at Diamond Light Source. "Efficiency is an important factor here." So he was all ears when Phil Taylor, Global Strategic Accounts Manager at air-conditioning specialists Stulz, suggested upgrading the existing cooling units for the sensitive electronics to achieve a significant energy saving.

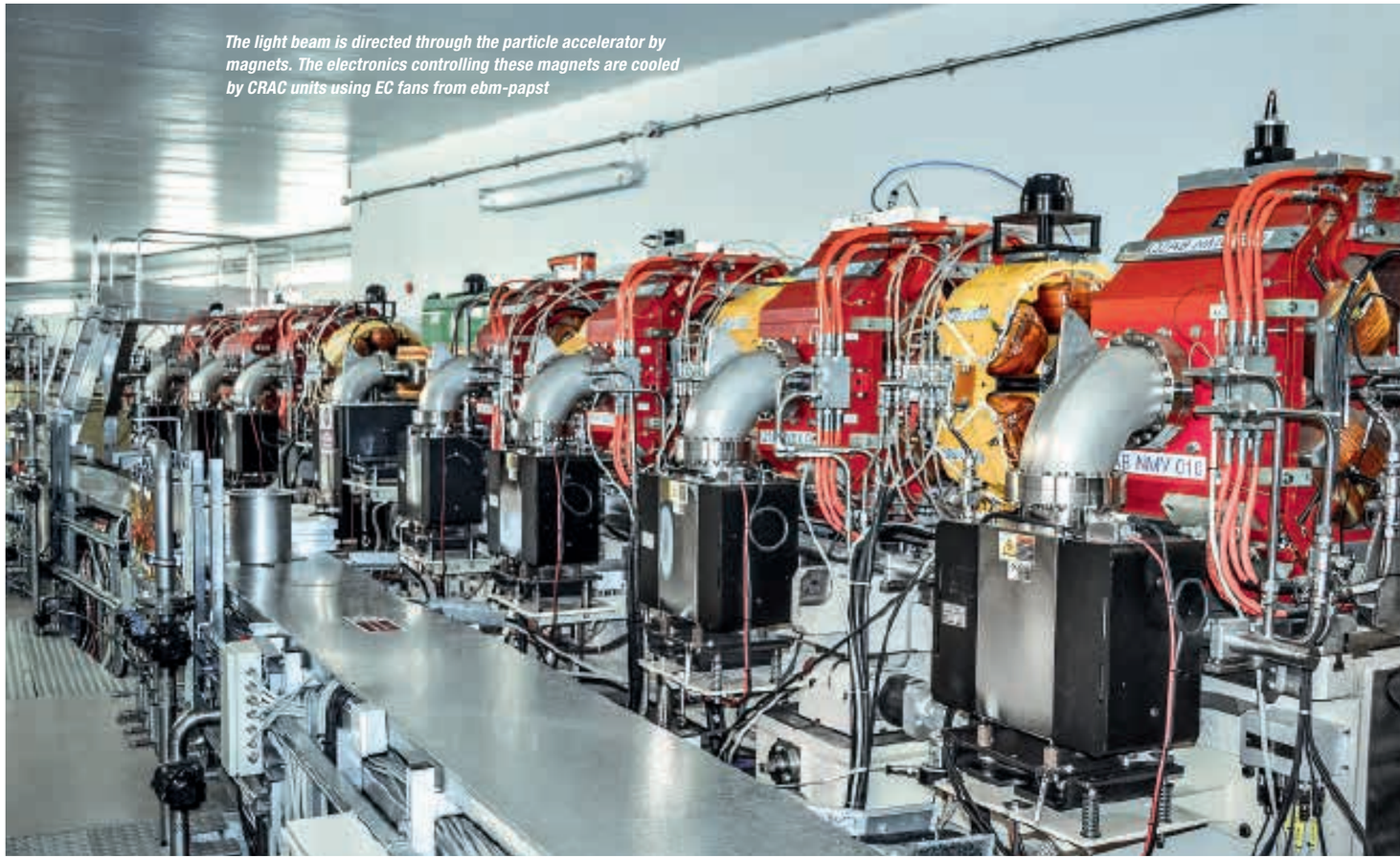
Great potential The pair met with James Cooper, Product Manager at ebm-papst UK, at the high-tech research facility to pin down how much potential existed. They examined 27 CRAC (computer room air-conditioning) units installed by Stulz. Instead of a server room, they cool the electronics used to control the magnets that convey the light beam through the storage ring. The units were previously all fitted with belt-driven

THIS IS HOW THE SYNCHROTRON WORKS

Diamond Light Source is a particle accelerator based in Oxfordshire, England. The synchrotron accelerates electrons to speeds approaching the speed of light, creating extremely bright light beams that can be up to 10 billion times brighter than sunlight. Researchers use this like an extremely fine microscope. To generate the light, an electron gun first fires electrons out into an accelerator, where the particles are heavily accelerated. As soon as they reach the required speed, the electrons are shot out into the 560 metre storage ring. As the light hurtles through the ring, magnets agitate the beam, further increasing the brightness of the light. A range of laboratories connected to the ring divert the light from the storage ring to use it for various experiments. Over 500 staff, together with 3,000 visiting scientists every year, conduct research into areas such as medicine, nanotechnology, archaeology, engineering and environmental science.



The storrage ring of the synchrotron measures 560 metres



The light beam is directed through the particle accelerator by magnets. The electronics controlling these magnets are cooled by CRAC units using EC fans from ebm-papst

AC fans. Together with his partners, James Cooper came to the conclusion that switching to RadiCal® EC fans would be worthwhile. “We estimated potential for savings of around 39 percent,” says Cooper, “to fully convince the customer, however, we were initially commissioned to upgrade a single CRAC unit in a test run.” This task was carried out by ebm-papst together with the installer Cinque Energy Solutions.

Tailored installation The main challenge here was the small installation space in the CRAC units. “These sit on a solid concrete base, so it was impossible to assemble the EC fans in the base as usual,” explains Phil Taylor. Working together with the installer, ebm-papst developed a special metal frame that allowed the fans to be installed in the units, despite the tight area. In addition, the housing positions the fans at the right angle to ensure the best air flow through the cooling unit. ebm-papst UK manufactured the special housing at its own production facility to allow the customised solution to be implemented quickly.

Green light for upgrade The test run began as soon as the technicians from the installer completed the upgrade of the first unit, with positive results. The energy saving exceeded estimates by almost five percent.

“We managed to significantly exceed the expected saving of 39 percent.”

James Cooper, Product Manager at ebm-papst UK

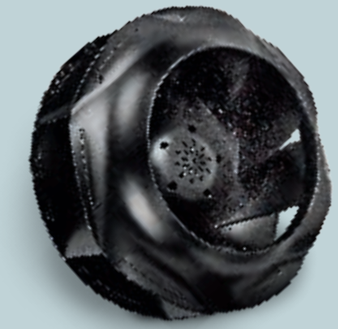
One of the most important things for the operators of Diamond Light Source here was keeping the temperature constant in the technical space to be cooled. In order to ensure this, the EC fans are fitted with a 0-10 V controller that is easy to operate. This allows all units to be adjusted individually to the requirements of the spaces.

The test run also revealed further potential for improvements: “We were able to further optimise the air flow by enlarging the hole in the housing beneath the fans,” recalls Cooper. The test run and the extra efficiency improvements were enough to convince the decision-makers at Diamond Light Source to give the green light.

A race against time The upgrade team were now faced with a daunting schedule. The fans could only be replaced during the synchrotron’s brief off-line period, giving the team from the installer just 14 days to retrofit the remaining 26 cooling units. The technicians therefore worked in two teams of three on the upgrade. To minimise delays, ebm-papst delivered all 54 EC fans directly to the CRAC units. The first task was to remove the old belt-driven AC motors. The installers then open-up the base plate using a special cutting tool to improve the air flow, before fitting the individually adapted RadiCal® centrifugal fans from ebm-papst. After restoring all the connections and

The technicians completed the upgrade to EC fans in just two weeks

The individually produced metal housings ensure optimum air flow



RadiCal®

The RadiCal® centrifugal fans with backward-curved blades stand out by halving the noise level and significantly reducing the energy requirement. These improvements are made possible by an aerodynamically optimised impeller made from fibreglass-reinforced plastic. The motors in RadiCal® low-pressure centrifugal fans have been miniaturised and are much more compact than their predecessors. With the current dimensions, easy and trouble-free replacement of existing AC solutions is possible at any time.

adjusting the manual speed controller, the system upgrade was complete. Working along this procedure, the technicians went from one unit to the next so that all CRAC units were fully functional when the system was started again.

The hug test Using the RadiCal® fans, Diamond Light Source now saves 55 percent of the energy used in daily operation compared to the old AC fans. This represents an annual CO_2 reduction of 46 tonnes. Operating costs are also reduced, with Diamond Light Source spending 40,000 euros less per year thanks to the upgrade. “These are some impressive results. Another positive is that the upgrade work did not affect the operation at all,” says Lee Walters. Aside from the high energy saving, Diamond Light Source also benefits from significantly reduced vibration and noise following the upgrade. This is an important improvement, especially given the sensitive high-tech equipment. Walters: “One of our staff now always gives the system a hug to check if it is actually running. Previously that was obvious, due to the heavy vibrations and the noise.” ○

More pictures at mag.ebmpapst.com

“The upgrade work did not affect the operation at all.”

Lee Walters, Maintenance Manager at Diamond Light Source

Pure Gold

elframo gas deep-fryers make really perfect chips. What you really need for properly crisp food is a condensing system from ebm-papst

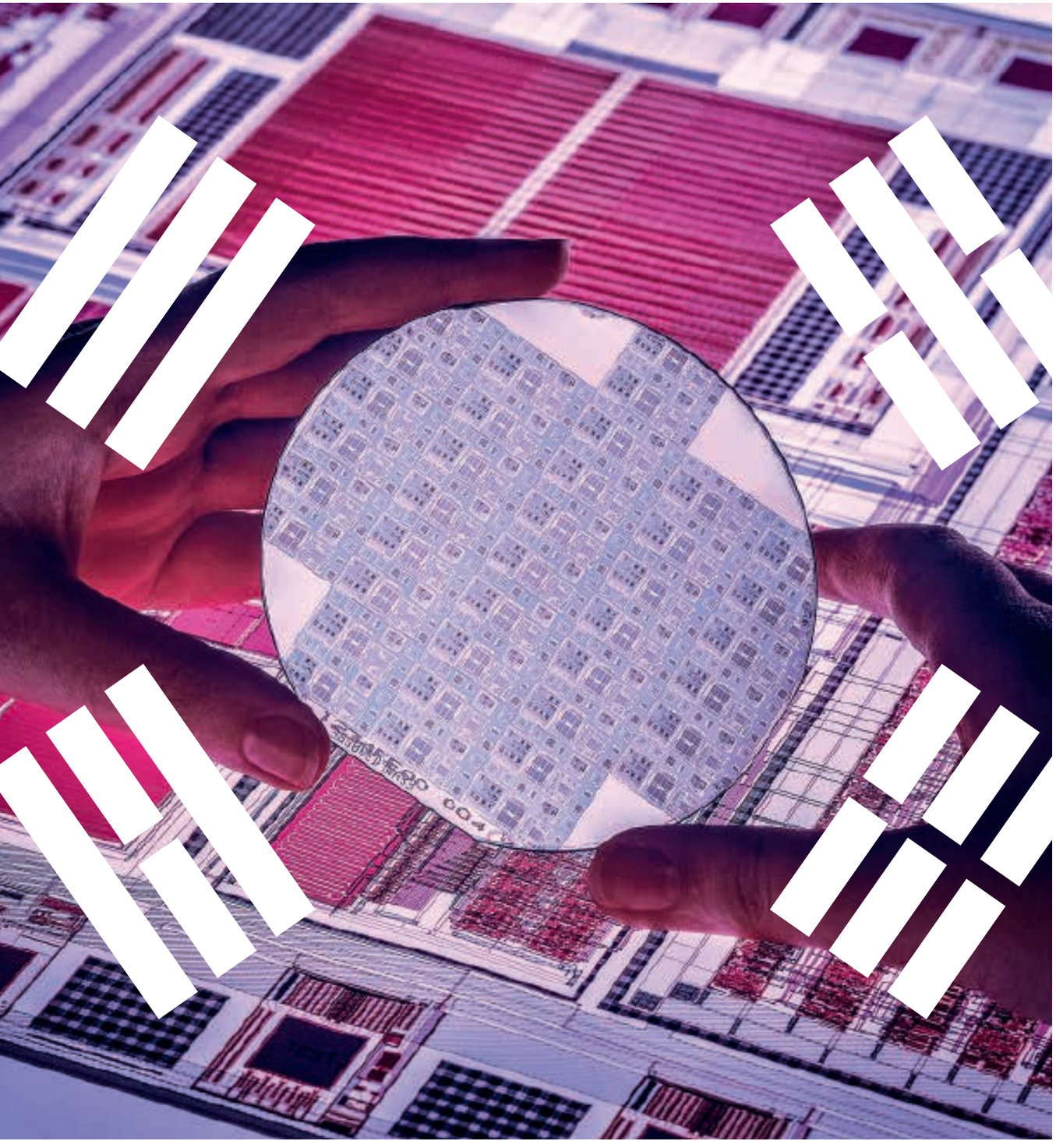
Evenly golden brown and crisp on the outside, deliciously creamy and melting on the inside: Potato sticks deep-fried in hot fat were first recorded in 1781 in Belgium, and have long since evolved into an internationally popular snack. But cooking them to perfection is not so easy. It takes a good quality oil and a deep fryer that can heat it quickly to exactly the right temperature as and when required.

Versatile and economical Such as the eco-friendly gas-powered fryer “Friggy” from elframo, Italy’s leading supplier of commercial kitchen equipment. Its core element is the condensing heating system NRV 118, which was developed in close cooperation by ebm-papst Heating Systems and ebm-papst Landshut. The perfectly coordinated components that make up this system solution comprise a blower with integrated venturi and a gas valve to guarantee optimal gas/air mix with high modulation ranges. This is important for deep fryers that can be used for cooking either large or small quantities. To cook a large amount of food the oil needs to rapidly reach its maximum temperature, but for smaller quantities it is also important to immediately reduce the power. In this way, not only is the fried food beautifully crisp, but the appliance can reduce its fuel consumption. The burner is also fitted with a dynamic infrared-controlled thermostat to ensure the efficient use of energy throughout.

From service provider to partner This customised solution is the fruit of a development phase characterised by the comprehesive exchange of information between elframo and ebm-papst, because only a fundamental understanding of the overall application can ensure an efficient condensing system. This close partnership has resulted in a product that is not only environmentally-friendly but also energy-saving and cost-effective, all advantages that also benefit the end user.With this single-source system solution elframo can rely on having a perfectly coordinated pretested package. This saves time and money in the run-up to production and later simplifies maintenance.

Smaller and more efficient Last year, elframo’s products earned the Innovation Award of the Italian industry association Confindustria. An incentive for further developments to fulfil customers’ demands for new powerful appliances that are even smaller and use fuel even more efficiently. The system partner is well prepared: a powerful young successor to the NRV 118, the NRV 77, is already standing by for these new products. ○

Gas deep-fryer with a system: the “Friggy” with condensing heating system NRV 118



Land of clean rooms

Smartphones, TV's, computer chips: South Korea is the world's supplier of high-tech gadgets. The country is now also discovering its love for energy-efficient production

In the 1960's, the Republic of Korea was still a war-scarred nation of poor rice farmers. But in just a few decades, the Asian tiger caught up and is now one of the world's most important economies. By far the most important industry is high-tech products.

More clean rooms than anywhere on the planet South Korea is home to the global leaders in electronics production. Half of all flat-screen TV's, displays and TV's with LED and LCD technology are made here. These are accompanied by computer chips, smartphones and tablet PC's – all products that are at least partially manufactured in clean rooms..

Korea leads, the world follows Lee Kun Sub, Managing Director of ebm-papst Korea, indicates: "Korean clean room producers are setting the technological benchmarks. Innovations made here will soon be seen in the rest of the world." This is true, for example, for the efficient GreenTech EC fans from ebm-papst. They are used in ceiling-mounted compact filter fan units (FFU) that combine filter technology with ventilation. "This kind of ventilation system can only achieve an efficiency level of over 50 percent by using adjustable EC fans. And that is exactly what an increasing number of FFU manufacturers are demanding. The high air exchange rates in clean rooms mean that air-conditioning and ventilation are by far the biggest energy consumers, so anything that makes them more efficient is welcome", explains Lee.

Another feature that is going down well with Korean customers is the material. The plastics used in the impellers are absolutely harmless in terms of outgassing, which is a sensitive topic in clean rooms. This is important in wafer production, for example, where aluminium impellers are avoided out of fear of metallic contamination.

"In the past five years, we saw particularly strong growth in clean room technology, as we were producing large numbers of televisions for Europe and America", explains Lee. "Those markets are fairly saturated, everyone has a flat-screen TV. Now the focus is on China." Due to high import tariffs in China, the South Korean firms are now starting to construct huge plants directly in the country.

Telecommunications and data centres Other customers of ebm-papst Korea also come mostly from high-tech industries, such as telecommunications. Ventilation systems play an important role in mobile base stations. "This is still a major growth market. The stations are becoming more powerful and more compact: ideal conditions for our compact fans." The same applies to data centres that are being built all around us: in banks, telecommunications firms and of course in the massive companies in the electronics and automotive industries.

Moving towards greater efficiency The idea of energy efficiency is still a fairly recent one. Energy is cheap, as the state heavily subsidises power for industry. "We have however seen a clear trend towards more energy efficiency in recent years", says Lee. The country's largest electronics manufacturers want to produce using the most modern technology in the world. Part of this is a greater focus on energy efficiency. For this reason, various corporations have developed strict internal energy consumption regulations in the last two years. "We are convinced that with its EC technology, ebm-papst will profit from this trend," predicts Lee. "This is just the beginning." ○

A fan installation module for filter fan units, ready for connection. Using GreenTech RadiCal® fans, they achieve an efficiency level of 50 percent and reduce noise levels by up to 7 dB(A).

THE IDEAL CHOICE

In its role as the workhorse of IT, or Mr Reliable in medical technology, the robust and durable 3300 N is the ideal choice. The 92 x 92 fan in a reworked housing with improved efficiency is also around 4 dB(A) quieter than its predecessor. If the operating conditions are a bit tougher, it is also available in an IP-54 configuration.

A COOL PACKAGE

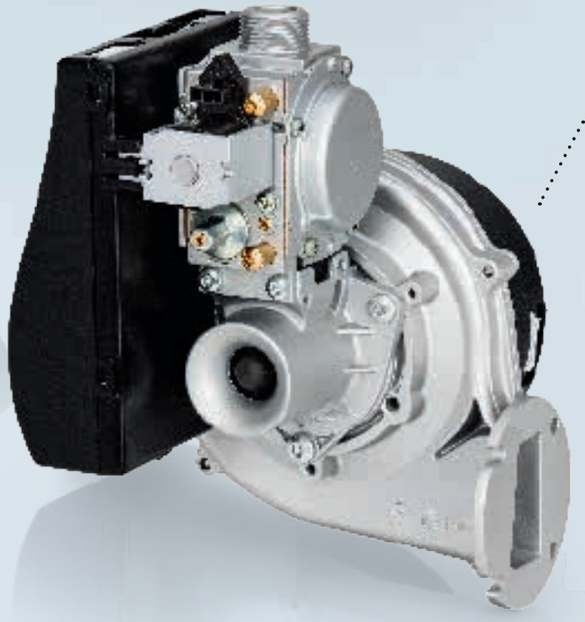
The new energy-saving fan for evaporators sets new benchmarks with its compactness and high efficiency thanks to its GreenTech EC motor. This plug-and-play solution also offers excellent flexibility in installation, making it perfect for retrofitting.

THE NEW MODULAR GENERATION

The new EC axial fans, available in sizes from 400 to 910 mm, stand out with their modular motor system, which enables fan selection to be perfectly adjusted to your needs. This new series also offers higher air performance, combined with reduced noise levels.

POWER IN A SMALL PACKAGE

The Performax® Plus planetary gear offers maximum performance yield in a highly compact package. Depending on the output speed, it can convey centrifugal forces of up to 2,000 N. With virtually double the amount of torque and a particularly robust design, the tiny transmission packs a lot of punch. Installation in a centrifugal mounting offers the maximum usable diameter for the ring gear toothing, with the housing suitably compact.



THE PERFECT MIXTURE

The water heater kit, a system consisting of a NRG 118 gas blower, integrated venturi, E01 gas valve and automatic burner control, is perfectly suited to water heaters. This compact pneumatic gas-air mixture is highly efficient, quiet and durable.

More information: www.ebmpapst.com/product-news

COOL COOPERATION

Better air conduction, easy maintenance and high efficiency. That is what GEA Küba achieved when redesigning an air cooler in close cooperation with ebm-papst

When air cooler manufacturers design a new product, the process normally goes as follows. First the engineers develop the entire unit, then they look for a fan with the right operating point. A project by GEA Küba GmbH shows that it is worth rethinking this process, after they developed their new air cooler together with ebm-papst right from the start. “As our product had already been on the market for a few years, we planned a complete redesign”, explains Steven Duncan, Director of Technology, Research and Development at GEA Küba. “We brought ebm-papst on board from day one so we could perfectly attune all the components to each other.”

Challenging requirements At the start of the project, Duncan and his colleagues from R&D got together with Manager of Service and Product Management Mathias Lich and Thomas Heli, Head of Development at ebm-papst, to put their heads together. The team began by determining what the requirements were for the air cooler. These have become more and more demanding in the past few years, as today’s customers expect efficient systems with high air throw that can also be easily cleaned and maintained. Air coolers are often used in food refrigeration, meaning additional strict hygiene requirements for the devices used. In order to meet all these expectations, the teams from ebm-papst and GEA Küba prioritised improving the air conduction in the cold store. “We use so-called air-guiding systems to increase the air throw”, explains Thomas Heli. “They reduce the swirl from the stream of cooling air coming from the air cooler. This prevents the air flow from bursting and the cooling air reaches every last corner of a room.” This task was previously fulfilled adequately enough by honeycomb-like air-guiding systems, but efficiency was low. The reason for this was that although the previous component guided the air correctly, it also caused a high loss of pressure, which led to a reduced air flow. This meant that the power of the fan was not being implemented as well as it could. The solution that the partners found

The team that brings air to every last corner of cold stores. Thomas Heli, Head of Development at ebm-papst, Steven Duncan, Director of Technology, Research and Development at GEA Küba and Mathias Lich, Manager of Service and Product Management at GEA Küba

“In this version, energy consumption is reduced by 30 percent.”

Steven Duncan, Director of Technology, Research and Development at GEA Küba

is an air-guiding system newly developed by ebm-papst, which directs the air without significantly reducing the air flow. This helped the air cooler to double the air throw compared to the solution without an air-guiding system. To achieve this, the project teams of the partner companies, both in technical and commercial areas, worked together like a well-oiled machine to implement new ideas quickly and easily.

Efficiency gets another significant boost when the air cooler is fitted with an AxiCool EC fan. “In this version, the energy consumption is 30 percent lower compared to AC technology,” explains Steven Duncan. “In some cases even up to 67 percent.” The EC motor version offers the additional advantage of conveying much less heat into the cold store and can be easily controlled from 0 to 10 volts according to requirements via a signal.

Easy maintenance But when it comes to actually using the fans, efficiency and strong air flow are not everything. “Another important factor for customers is

being able to clean and maintain the air cooler easily," says Matthias Lich. That is why all air conduction components in the air-guiding system are made from high-quality plastic. As well as opening up new possibilities in design, these materials also offer further advantages. Mathias Lich: "These materials help us achieve very smooth surfaces that are not vulnerable to corrosion. This is especially important in the food industry. The plastics are also less sensitive to aggressive cleaning products."

"Customers want to be able to clean and maintain the air coolers easily."

Mathias Lich, Manager of Service and Product Management at GEA Küba

Cleaning is also made easier due to the fact that the wall ring is mounted on a hinge, meaning it can be folded out to the side when cleaning the heat exchanger. Exclusively for GEA Küba, ebm-papst integrated the terminal box for connecting the AxiCool fan into the hinge, saving space and keeping the design of the air cooler simple.

At a team meeting, Lich, Duncan and Heli noticed another advantage provided by the new plastic wall ring: it is hollow and designed in a way that allows a heating tape to be integrated. "By specifically heating the inner side of the wall ring, we are able to much more efficiently prevent the formation of so-called ice bridges that cause the fan blades to freeze up", says Mathias Lich. As the heating tape is no longer mounted on an open wall ring from outside as was previously the case, it now only works where it is really needed, thus making the wall ring heating up to 80 percent more efficient.

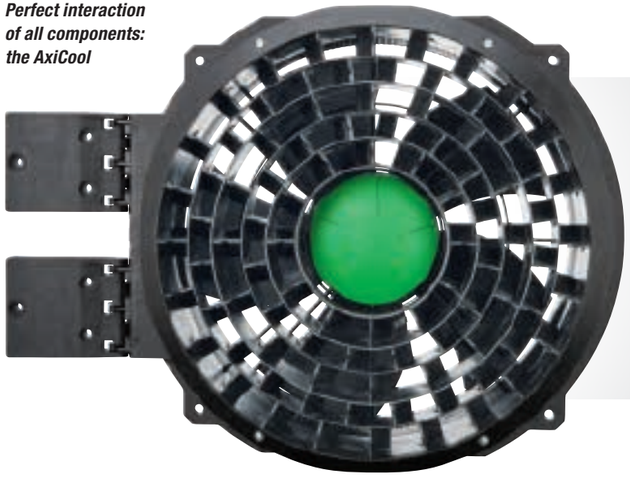
"We share the same understanding of quality and cooperation."

Thomas Heli, Head of Development at ebm-papst

A model for the future The new series of air coolers has been on the market for just over a year and the feedback from customers has been consistently positive. The project partners, too, are happy with the results. Thomas Heli: "Thanks to the excellent relationship of trust, we in the entire interdisciplinary team were able to work with a high degree of motivation. It is also a big help that our companies share the same understanding of quality and cooperative partnership." Mathias Lich adds: "After this extremely positive experience, we will continue to work on developments with ebm-papst in the future." ○

More pictures at mag.ebmpapst.com

Perfect interaction of all components: the AxiCool



AxiCool AxiCool fans set a new market standard for evaporators and cooling units with the perfect interaction of individual components. The compact axial fans impress with their simple handling, top efficiency in every regard and careful resource preservation. Convenient service, ease of operation and excellent air throw round off the spectrum of positive features. As the fan can be mounted with just four screws, they are "plug and play" solutions in the truest sense of the phrase.

Can't someone else do it?

The automatic lawnmower from SABO and John Deere is making life easier for gardening enthusiasts. Thanks to ebm-papst, it is also quiet and efficient

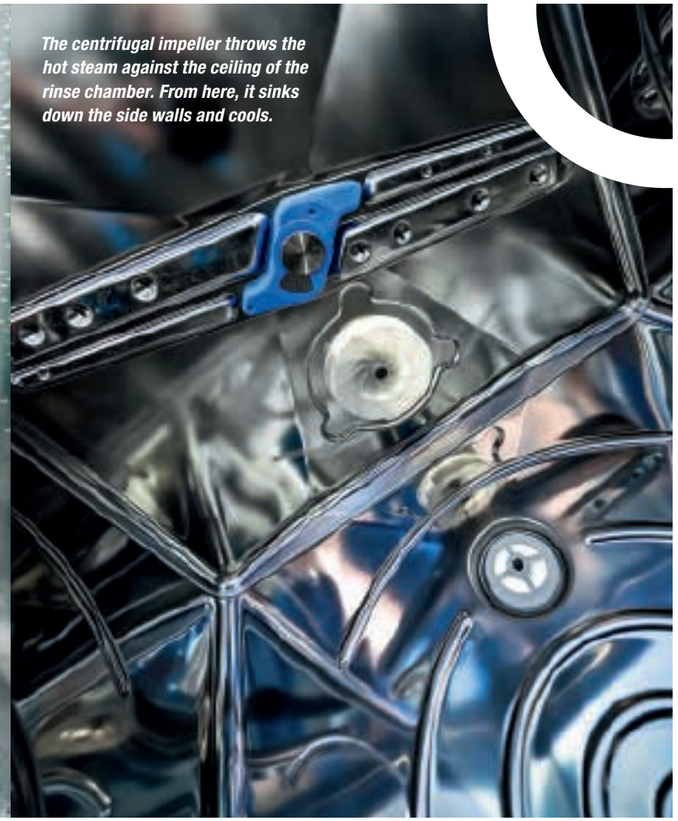
Mowing the lawn. For some, it is a meditative routine for a Saturday morning. Others see it as backbreaking drudgery and a waste of valuable free time. All gardeners belonging to the second category will be pleased to hear that American company John Deere, together with its German subsidiary SABO, is now offering a convenient solution: the automatic lawnmower. The small appliance drives under its own power along a predefined area of lawn up to 1,800 square metres in size and mows it evenly. It is powered by a battery that can charge itself if required.

Watch the ebm-papst.TV° video at www.youtube.com/ebmpapstDE

Efficient and quiet "Along with the time saving that our automatic lawnmowers grant, they are also very efficient and quiet", explains Sven Hahnenkamp, Product Manager at John Deere. Two advantages that are down to ebm-papst." John Deere USA approached our American subsidiary and requested two motors with transmissions for the wheel motors and a motor to drive the mower blade", recalls Markus Flaig, Project Manager for industrial drive development at ebm-papst St. Georgen.

These motors need to fulfil a range of requirements. The wheel motors must deliver as much power as possible in a compact space, whilst keeping energy consumption low. "Every low-consumption component improves the running time of the lawnmower", explains Markus Flaig. In the end, the project partners decided on a compact ECI-42 motor with transmission, which was adjusted precisely to the needs of John Deere in a pilot project. The high efficiency of the motor-transmission combination enables the robot to easily master uneven surfaces and inclines of up to 35 percent.

Dynamic blade motor The blade motor is taken from the ECI-63 modular kit. This dynamic motor starts quickly and stops within the required two seconds when the user lifts the robot from the ground, an important feature that prevents injuries. The motor's low imbalance means that the blades run smoothly and do not start to jitter. This is reflected above all in the noise level. The lower the vibration in the blade, the quieter the mower goes about its business. The automatic lawnmower is now so quiet, it can be used at any time of day or night. Meanwhile, its owners can enjoy the summer and let the robot take care of the lawn. ○


The centrifugal impeller throws the hot steam against the ceiling of the rinse chamber. From here, it sinks down the side walls and cools.

Watch the ebm-papst°TV video at www.youtube.com/ebmpapstDE

Letting off steam

The new range of commercial dishwashers from Meiko relies on energy-efficient and user-friendly solutions – with the help of ebm-papst

The dishwasher cycle has finished and the dishes are clean. All that remains is to open the door and get a load of hot steam right in your face. Virtually everyone has had this unpleasant kitchen experience at home. But the dishwasher here is used only once or twice a week. In canteens, restaurants, cruise ships and hospitals, enormous amounts of dishes are washed every day. The used dishes usually have to be made absolutely clean and free of bacteria within a few minutes, before being sent back out to visitors, passengers or patients. The staff operating the dishwashers have to put up with the unwanted steam bath many times a day. Furthermore, the damp, hot air has a negative influence on the climate inside the kitchen.

The company MEIKO Maschinenbau GmbH & Co. KG are experts in commercial dishwashing technology and have developed a solution to the problem with the AirConcept for their M-iClean series. “The energy that takes the form of waste heat in the dishwashing process is regained at the end of the cycle and then fed back into the process”, explains Bruno Gaus, Head of Development at MEIKO.

A fan installed in the interior of the machine conveys the hot air through the heat exchanger so that it can be used again in the heating process. It acts like a “turbo” that intelligently conveys the air. The flat impeller throws the air stream against the ceiling of the rinse chamber. From there, the air moves downwards along the side walls, where the steam condenses against the cooler surface. This natural convection, in other words the process of the cool air sinking downwards, would take far too long without the fan. After all, a drying cycle can only last just over a couple of minutes.

MEIKO brought in ebm-papst to help with the technical configuration of the fan. “Energy efficiency is extremely important in our dishwashers,” emphasises Gaus. “For that reason, the individual components also need to be especially efficient. The EC motor from Landshut fulfils this requirement.” At the same time, the motor is also needed to be as compact as possible. For ebm-papst, this project represented a very special challenge. “Due to the reduced space in the dishwashers, we needed a more compact, energy-saving fan that would also permanently withstand the powerful cleaning detergents used”, explains Ralf Braun, who as ebm-papst’s Area Manager for Offenburg works closely together with the company in south-west Germany.

The new M-iClean

Over the course of the 18-month joint development, the team decided on the BG36 standard motor, but with customised 24 V electronics. On top of that, the motor was fitted with particularly robust seals and materials ready for use in the dishwashers and drives a specially designed impeller. The motor is designed for high speeds of up to 5,000 rpm, whilst also being extremely quiet and smooth-running.

Just as efficient as the motor was the cooperation itself. “MEIKO came to us with some very particular requirements and quickly developed an ingenious design which bore in mind the options that we had highlighted”, beams Stefan Obermaier from ebm-papst Landshut, who managed the project. Bruno Gaus, who has been developing dishwashers for the company from the Black Forest for 20 years, is also very happy with the result: “Development is all about a certain give and take. The cooperation worked extremely well.”

The new M-iClean range has been on the market since October 2013. With an illuminated status display on the door handle and a glass display with much more information for the user, the appliance is certainly a head turner. Now users can admire this feature without getting all steamed up. ○

More pictures at mag.ebmpapst.com

Since the start of the 2014 World Championship season, Formula One has been flying the flag for energy efficiency. To keep ahead of the competition, championship favourite MERCEDES AMG PETRONAS decided to team up with ebm-papst

FRESH IMPETUS FOR RACING CARS

From this season, Formula One is using sustainable solutions across its operations, such as hybrid technology in vehicles. "It's an obligation for Formula One to explore the technological boundaries", stresses MERCEDES AMG PETRONAS team boss Toto Wolff

Hybrid drives replace roaring eight-cylinders, efficiency rather than refuelling – Formula One has changed direction: Following a complete overhaul of the regulations, this year's World Championship will no longer be a platform for powerful internal combustion engines. Instead, Formula One will be demonstrating how modern drive technology can combine high performance with maximum efficiency. "Formula One represents the pinnacle of automotive innovation. And that means an obligation to explore the technological boundaries," says MERCEDES AMG PETRONAS team boss Toto Wolff in praise of this development. "The new rules will not only promote this type of innovation but will also help the sport to develop along the same lines as the automotive industry". A sophisticated hybrid Energy Recovery System (ERS), is a significant new development, with up to seven different energy recovery paths within the car achieving 750 horsepower with a third less fuel than was used previously.

And for the racing team, sustainability means more than just the car. Therefore, it was a logical decision to turn to ebm-papst for fresh ideas: Engineers from the two companies are working together to develop cooling concepts for the racing cars with the explicit aim of then incorporating the beneficial effects into series production. "We are delighted that MERCEDES AMG PETRONAS is showing so much interest in our sustainable technology and that we are able to play a part in the Formula One re-orientation process," explains Rainer Hundsdörfer, Chairman of the Board of Directors of the ebm-papst Group. "From our point of view this partnership represents an investment for the future, as MERCEDES AMG PETRONAS is currently setting new standards in the field of aerodynamic efficiency."

"It's an obligation for Formula One to explore the technological boundaries."

Toto Wolf, team boss MERCEDES AMG PETRONAS

A boost to efficiency Initial results are very encouraging. ebm-papst solutions are now being used to maintain stable temperatures within the race cars between runs (read more on the next page). There are plans to introduce additional specific cooling and heat extraction solutions over the course of the season. But this is only part of the long-term team partnership agreement. Aerodynamics and energy efficiency are key elements within the development teams of MERCEDES AMG PETRONAS and ebm-papst so it is natural that both teams are starting to exchange ideas and explore opportunities for performance gains in these areas.

And the MERCEDES AMG PETRONAS factory in Brackley, England will soon be reducing their energy consumption through the use of energy-efficient ventilation systems from ebm-papst. "I am convinced that this partnership will be to our mutual benefit," sums up Rainer Hundsdörfer. Being a true motoring enthusiast himself, he will be supporting the team more keenly than ever in the future. ○

Keeping cool with ebm-papst:

ROLL-HOOP

SIDEPOD

Racing is real hot stuff: *Depending on the race location, ambient temperatures can exceed 40 degrees centigrade during the course of a Formula One race. Natural cooling of car components is highly effective at 340 kilometres per hour, however, additional active cooling is necessary to manage the temperature increase during the initial period after the race car stops running. ebm-papst fan technology is utilized within the sidepod and roll-hoop apertures to actively cool the temperature sensitive components and systems on the race car.*

On the starting grid and in the garage, cooling is provided by the new "S Force" axial fans from ebm-papst with a performance curve which matches the high back pressure characteristics of the Mercedes system. This produces an enormous 518 percent improvement in air flow delivery and so satisfies the requirements for a compact, portable and powerful system.

Dr Bruno Lindl

Director of Research and Development at ebm-papst

International Protection Code

The IP Code indicates how well-protected a product is against dust and moisture. The position of the digits symbolises the type of ingress. The first digit indicates the protection against solid foreign particles (dust), the second against water. The higher the number, the greater the resistance.

Protection against dust

IPX4

Protection against spray water from all directions at room temperature

A false sense of security

Permanent functionality can only be guaranteed by using products in line with their specification

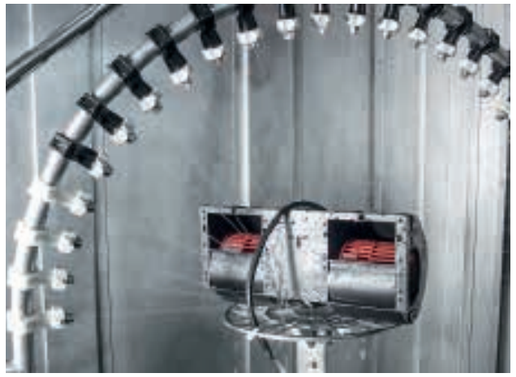
Our customers expect a product to work during its entire service life. Its functionality is influenced by the design concept, production process and application. For design and production, we use recognised guidelines such as the quality certificates DIN EN ISO 9001 and ISO/TS 16949. They ensure that the limits set in the technical specification are not exceeded.

This is not so easy when it comes to the actual application. Our products are used in all kinds of functional and climatic environments around the world: from minus 50 degrees Celsius in Novosibirsk to the burning heat of a rooftop in Saudi Arabia, from vibration-sensitive operation in a machine to highly sterile applications in medicine.

When selecting a product, assessing the conditions in which the product will be used is paramount. A product with the specification for operation up to 50 degrees Celsius, for example, would experience a malfunction at 80 degrees Celsius. But even within the given specifications, products cannot constantly operate at extreme values, just like you cannot permanently drive a car in first gear.

If the conditions are known, more information on any special mechanical or electrical requirements is required from those on the ground. This is where the International Protection Code (IP) comes in, indicating both the protection type – dust or moisture – and the protection rating. The IPC does not provide any information, however, on how the product behaves in relation to seasonal weathering and temperature changes. A product with the protection class IPX4, for example, is only exposed to spray water for 5 minutes at room temperature. In reality, the product will put in 40,000 operating hours in a range of very different environments and thermodynamic cycles. Relying on the IP information alone is therefore misleading.

It is vital then that our technical customer advisers, acting as the interface to the customer, determine precisely what the product will be confronted with in reality. The worst-case scenario is when a product is used and operated outside of its design parameters. ○



Five minutes of spray water at room temperature: a centrifugal fan in an IP test

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Trade fairs
Chillventa, Nuremberg, 14 – 16 October 2014
Expo China Shop, Fuzhou, 6 – 8 November 2014
electronica, Munich, 11 – 14 November 2014
Compamed, Düsseldorf, 12 – 14 November 2014
SPS IPC DRIVES, Nuremberg, 25 – 27 November 2014
AHR, Chicago, 26 – 28 January 2015
Climatización, Madrid, 24 – 27 February 2015
Acrex, Bangalore, 26 – 28 February 2015
expoEnergy, Wels, 27 February – 1 March 2015
Mir Klimata (Climate World), Moskow, 3 – 6 March 2015
ISH, Frankfurt, 10 – 14 March 2015
For more trade fairs dates visit: www.ebmpapst.com

Events
Cooling Days, Würzburg, 21 – 23 October 2014
13. ebm-papst Hallenmasters, 3 – 4 January 2015
Jugend forscht, Campus Künzelsau, 26 – 28 February 2015

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Swapping four wheels for two

Kai Gebhardt, HR Manager in Landshut, is joint founder of the JobBike initiative at ebm-papst and leads by example

At dawn, against a backdrop of fields and meadows, ebm-papst Landshut HR Manager Kai Gebhardt cycles to work. A few more pedals and Gebhardt arrives at the office. Every day, he makes the 18 kilometre commute from his home with the Singlespeed, a fixed-gear bike, as well as occasionally with his E-bike. He leased both work bikes through the JobBike scheme. “I got the project off the ground here in Landshut and therefore wanted to set a good example right from the start”, he explains.

The leasing model allows all employees to finance a bike for work with their monthly gross salary. The JobBike scheme was first presented in Landshut in June 2013 to coincide with the GreenDay campaign, which presents sustainability projects from ebm-papst companies all over the world. The ebm-papst sites in St. Georgen, Zeitlauf and Mulfingen are now also participating in the cycle leasing programme. In Landshut alone, 130 employees are already enjoying the practical benefits of the scheme.

Kai Gebhardt cycles the 18 kilometres from his home to work every day

An environmentally friendly commute “For me, riding a bike is important for my quality of life. I feel more balanced and enjoy the fresh air every day”, explains Gebhardt. Only when it’s freezing cold or icy does he reach for his car keys, as well as when on business trips. Using a bike to get to and from work doesn’t just help one’s own health, but also that of the environment. Leaving the car on the drive saves petrol and reduces CO_2 emissions, helping to make a daily contribution to climate protection.

Bike-friendly business This is a good fit to the company philosophy. As a manufacturer of energy-efficient products, ebm-papst lives and breathes sustainability every day. This was confirmed by the ADFC, Germany’s leading association for cycling enthusiasts, who certified ebm-papst Landshut as a “bike-friendly business” earlier this year, making it one of just 20 companies in Germany. Staff hold regular bike-related events. At the “bike check”, for example, the bikes are given a safety inspection. Encoding events help protect against theft, whilst at the annual GreenDay festival, interested staff can try out test bikes from local retailers. “We now work with seven specialists in and around Landshut and make sure our colleagues have a wide range to choose from”, explains Kai Gebhardt. The hugely successful JobBike model is presented every year at the town’s cycling campaign day. “JobBike is booming and the region has responded very well to our commitment.” ○

“Although ten years are far from being an eternity, we have come a long way since ebm-papst Argentina was founded in November 2004. I am really proud of what we have achieved: The company has not just become established on the South American market with a focus on the automotive and cooling industries, we are in fact the leading brand! Thanks to the long-term strategy we pursued right from the start we have managed to build up a great team and an excellent relationship with our customers. Over the past few years we have also extended our activities to many other Latin American countries, where we are enjoying the challenge of opening up new markets. After all, the economic situation has not always been ideal in this part of the world in recent times. So my greatest wish is for us to maintain our successful position and carry on growing throughout the whole region.”

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GERMAN SUSTAINABILITY AWARD 2013

ebm-papst is leading the way in efficiency and sustainability. Our customers are sharing our GreenTech philosophy and using our energy-saving fans and drives to greatly improve their products' efficiency, making them more environmentally friendly. That is why we were named "Germany's most sustainable company 2013". After all, the greatest victories come when everyone wins.
www.ebmpapst.com/sustainability

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