



Full steam ahead in the kitchen

Combi steam ovens by RATIONAL cook gently
and make everyday life easier for the cooks

°15 Enter here: Flexible security access lanes °16 One for all: The universal air-conditioning unit from Switzerland °19 Made of wood: Biomaterials for tomorrow °20 Creative thinking: Control cabinets with diagonal fans °22 Small lights magnified: How to cool LEDs properly

ebmpapst

“The best fans are from Essex”

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**GREEN
TECH**
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Thomas Borst
Managing Director
Sales and Marketing
ebm-papst Group

ErP: The countdown is running!

Dear readers, commission regulation (EU) No 327 / 2011 of 30 March 2011 will bring a fresh breeze into your life as of 1 January of the year 2013. At least if your

professional life is associated with fans. This directive defines the minimum efficiency level required of all fans that will be put on the market as of January 1, 2013 with an electric drive input ranging from 125 watt, no matter if they are part of a product or stand-alone. We estimate that approximately 30 percent of all fans currently available on the market will no longer satisfy these stringent requirements of the Energy-related Products Directive (ErP) of the European Union. And as of 2015, when the second stage of the ErP Directive becomes effective, approximately another 20 percent of fans used throughout Europe will no longer meet the minimum criteria. Now is the time to act. The background of these stringent regulations is the EU's pledge to reduce its CO₂ emissions by at least 20 percent by 2020, as documented in the Kyoto Protocol. The bottom line is that the ErP Directives are a good thing: for worldwide climate protection, electricity bills in

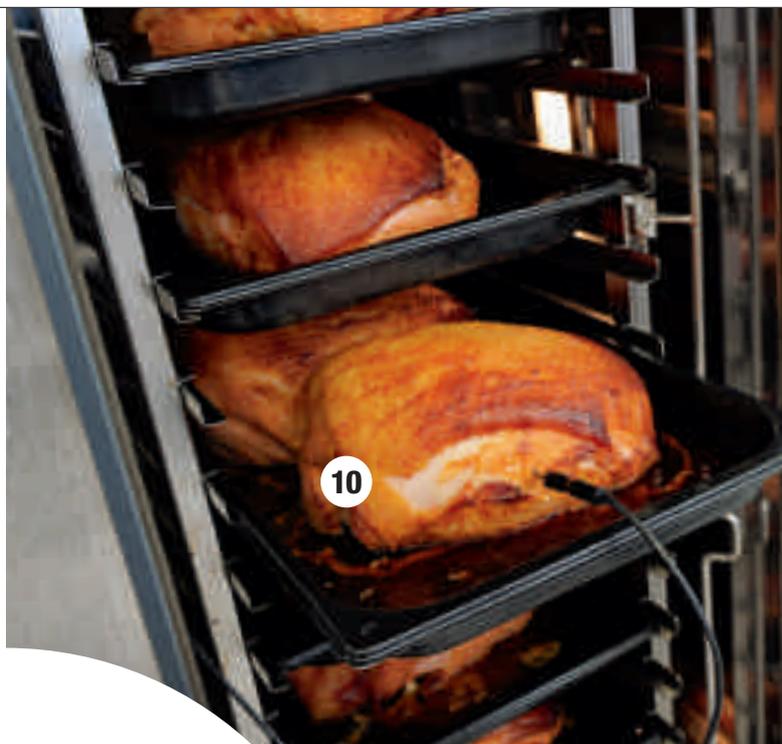
industry and other businesses – and for all market participants who switch to modern, energy-efficient products in a timely manner.

Our formula for stress-free dealing with the fan directive is called "GreenTech". Compared to conventional fans with AC motors, GreenTech EC fans attain a much higher efficiency than demanded. At their best, they are some 50 percent more energy-saving and operate extremely quietly due to optimised speed level techniques and the aerodynamic design of the impellers. Moreover, they are extremely reliable and durable. Best of all: For nearly every fan that will no longer be permitted in the future, there is already an energy-efficient GreenTech replacement which not only fulfils the specifications of the directive, but even significantly exceeds them. You can find detailed information and decision-making aids dealing with the topic of the ErP in our online magazine at mag.ebmpapst.com. All GreenTech EC products are "**Ready for ErP 2015**"!

PS: In our online magazine we also conduct a very brief reader survey to learn more about the "efficiency" of the issue you have in your hands right now. Please let us know how you like our customer magazine **mag**°. Thanks in advance, and enjoy reading this issue!



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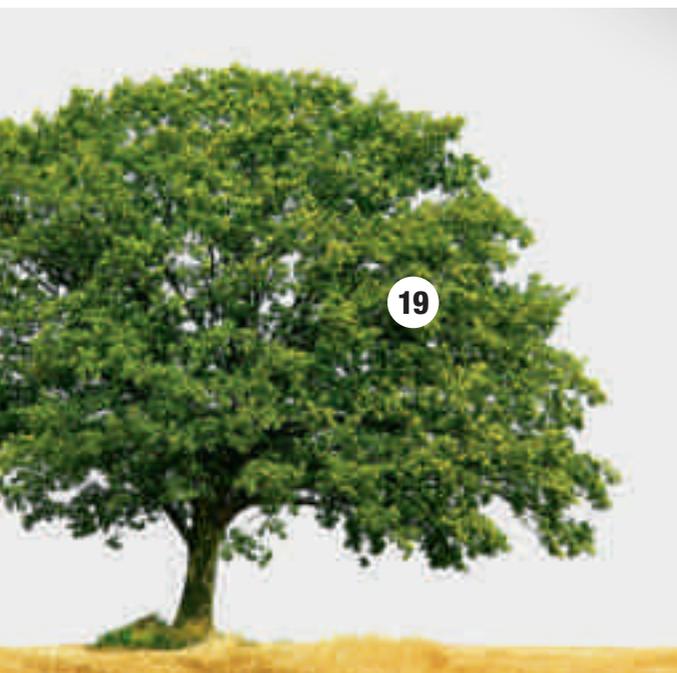
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Comparison at eye level: The A-Juniors of the German Bundesliga clubs assess the Indoor Championships

Football with tradition

The 10th ebm-papst Indoor Championships

The tenth Indoor Championships drew nearly 2,000 spectators to Mulfingen's Gerhard-Sturm-Halle on 6 and 7 January. To kick things off, last year's winner, FSV Hollenbach, defended its title against eleven clubs in the region. On day two of the tournament, Eintracht Frankfurt was able to win the first-class studded A-Juniors German Bundesliga tournament for the third time. To do so, it had to prevail against professional clubs, such as Borussia Dortmund, Borussia Mönchengladbach and VfB Stuttgart, as well as two of the region's amateur teams. The ebm-papst Indoor Championships originally came into being to animate the

sports arena, built in the year 2000, with popular sports. Meanwhile, in and around Mulfingen, this weekend at the beginning of the year totally revolves around indoor football and has become an important date for fans as well as for professional clubs – the prestigious tournament is a young, but established tradition. According to Kai Halter, one of the first organisers and Head of International Sales Marketing at ebm-papst, "Many visitors are regular guests, who begin each new sports year with the event in the Gerhard-Sturm-Halle."

<http://www.ebmpapst-hallenmasters.de>

What is being built here, Mr Brandl?

Stefan Brandl, Managing Director of ebm-papst Landshut, on the new logistics centre

The excavators in Landshut will be working soon?

Yes, we're expanding the location. In April we will begin the earthworks for a new logistics centre that will be brought into operation in 2013.

ebm-papst is investing 11.5 million EUR in this.

What do you hope to gain from it?

We don't primarily want to renew only our logistics; rather, for us it's about getting more space for production. We have grown very dynamically over the past few years at the Landshut location, but have no possibility space-wise to grow any more right at the location. And before we build a second production site in Landshut, we would rather have logistics have their own centre. So we are designing it to be very efficient and we can use the vacant space for growing production.

What advantages does this bring to the customers?

Primarily it gives us greater efficiency, by reducing the

number of warehouses, for example. We have planned the logistics centre so that we can store material for production and also all finished products that are produced so that we can bring them directly to the customers. Although our delivery quota is already at a very high level of 97 percent adherence to quantities and deadlines, this will give us a nudge towards being even quicker and more flexible.

“With this, we are even faster.”



Everything about ErP

Online special about the new directive

In 2013 the Energy-related Products Directive (ErP) of the European Union comes into force. Its objective is to increase the energy efficiency of electrical devices by 20 percent by 2020. Accordingly, fans will also be subject to new minimum requirements. Our customers still have a large need for information, which is why we have prepared an extensive dossier for you in our online magazine **mag**°. There you will find answers to the most important questions concerning the ErP – concise, accurate and easy to understand. Which fans are affected? What effects does this have on your products and ours? Will the new fans be more expensive? Learn more at

<http://mag.ebmpapst.com>



News in brief

A panel of experts distinguished ebm-papst with the **Materialica Design and Technology Gold Award** in the “material” category. The prize for the targeted implementation of resource conservation with the biomaterial “epylen” was presented at the Munich industry trade fair.

And the **AL-KO Supplier Award** for best performance also went to ebm-papst in December. The AL-KO Kober Group thus also offered its praise; despite a global supply bottleneck for electronic components, the delivery of GreenTech EC fans has been conducted reliably at all times.

The trainee’s project “energy scouts” is one of the winners of the “**365 Landmarks in the Land of Ideas**” competition. In this project the trainees learn the importance of saving energy and climate protection.

Holding a “GreenWeek” from April 16 to 20, ebm-papst in Mulfingen opens the “**Everyday is a Green Day**” campaign. In this campaign the international subsidiaries present their engagement for sustainability.

Haitian children express thanks for the new school



Hohenlohe helps Haiti

Four schools built in Port-au-Prince

On January 12, 2010 an earthquake destroyed vast parts of the already poor Caribbean island nation of Haiti. Hohenlohe companies and citizens raised a total of 73,400 EUR for reconstruction in a co-ordinated fund-raising campaign. ebm-papst and its employees donated with them.

Now the money has arrived for the people of Haiti in a very concrete manner: the religious order of Don Bosco Salesians has erected four small new schools in the capital city, Port-au-Prince. Some 480 girls and boys between six and twelve years old now again have the opportunity to receive regular instruction.

5 Give us minutes!

What topics would you like to see in **mag**°?

Do you like the design of the magazine?

What do you think is good; what should

be made better? The reader is our

standard. We, the editorial staff

of **mag**°, would like to know

your opinion and look forward

to your response. Please take

five minutes to answer the

ten questions online. Here is

a link to the reader survey:

<http://mag.ebmpapst.com>





Adriana Belmiro da Silva at the workshop with end customers

Closer to the end customer

First customer workshop in Brazil

Over fifty ebm-papst partners and customers met in the facilities of the Brazilian sales centre near São Paulo in August for a workshop to gain and exchange information on the topic of cold chains, above all in the food industry. “As the market for cooling technologies has grown massively in the last few years, we wanted to talk directly to our end customers about their needs,” said Adriana Belmiro da Silva, Managing Director of ebm-papst Brazil.

Experts showed the participants where the sources of failure and danger lie in operating a cold chain and how air flow and temperature fluctuations can be implemented energy-efficiently for optimum cooling of meat. The representative of the second-biggest Brazilian food producer, Brasil Foods (BRF), Joel Pereira Neves, stated that his organisation places the highest value on food safety and environmental performance. “We are very happy with the results that we have achieved in energy efficiency with ebm-papst,” said Neves.

Trainees for England

Young people lend a hand for the UK main website

The two ebm-papst trainees Benedikt Täger and Nico Britsche supported the English subsidiary in Chelmsford during revision of their location’s main website for one month. In a team with Ines Kappes and Regina Murschel both had previously worked in Mulfingen on the main training website. For all of August their work in England was in the foreground, but the trainees also got to know the country and people. By now these two have supported the Brazilian subsidiary with its web presence and they have cooperated on building the homepage for the “Hallenmasters”.

<http://www.ebmpapst.co.uk>

<http://www.ebmpapst.com.br>

<http://www.ebmpapst-hallenmasters.de>

<http://www.ausbildung.ebmpapst.com>



Benedikt Täger and Nico Britsche at work in England

Reducing traffic: In China ebm-papst prefers bus instead of cars

At ebm-papst, environmentally responsible actions are a matter of course. Accordingly the headquarters of ebm-papst in China and the Shanghai plants in WaiGao-Qiao and Nanhui provide busses for their employees. The longest distance of the seven lines is 46 kilometres. Every day approximately 130 employees use the ebm-papst busses to get to work and back instead of using their own cars. Therefore ebm-papst in China contributes essentially to environmental protection: 400 kilogramme of carbon dioxide less; day by day.



Going to work by bus: Employees at the Nanhui plant

For more information please go to: www.ebmpapst.com/product-news

HEAT DISCHARGE A robust exhaust blower is now being implemented in pellet ovens. The advantages of familiar GreenTech EC technology are evident in removing the hot combustion air: the blower works reliably, quietly, economically – and offers ideal conditions for perfect, low-emission combustion through its good controllability.



SOOTHING TO THE NERVES

Unlike its commercially available colleagues, its reduced structure-borne noise makes the DC axial compact fan 8450 H4 pleasantly quiet. Moreover, it comes with a new, reinforced bearing system and powerful motor with heightened power reserves.



POWERFUL, LIGHTWEIGHT The ECI drive family is growing: The ECI-42 is the latest addition to the modular system for individualised applications with lower torque and power requirements. The 40 percent lighter motor performs outstandingly well in comparison to the predecessor with higher power density and almost double the torque.



Oil pump drive In oil-fired condensing boilers a size 4320 motor operates the oil pump. The motor, with its high-tech bearing design, provides for a long service life and smooth running and can, moreover, be separated from the oil pumps for maintenance.



With its exact control, it increases the efficiency of the application even more – and with that, can save raw materials and costs.

THE LARGEST IMPELLER is turned by the centrifugal fans of the new size 630 of the RadiCal®: to date, there had been sizes from 133 to 500; now, ebm-papst has extended the series even higher. The fans with the innovative impeller have already been distinguished with multiple awards. No

wonder: the compact external rotor motors are, thanks to GreenTech EC technology, unrivalled in energy savings and quietness – and guaranteed to be free of rare earth materials.



EXPLOSION PROTECTION CERTIFIED

the new fans based on the M3G150 are Ex-certified and therefore are ideal for implementation in gas-filled environments – for example, where customers increasingly make use of natural refrigerants like propane.



www.greentech.info

The kitchen pro

The RATIONAL SelfCookingCenter® whiteefficiency® prepares delicious food in canteen kitchens. The expertise of the ebm-papst Group is bundled up inside of the combi steam oven and turns it into an efficient system which saves energy, costs and fat



*Michael Schmidt,
purchaser at RATIONAL,
with the efficient combi
steam oven*



What would you like today? Roast with sauce, fish and chips or assorted vegetables instead? In canteen kitchens guests are now spoiled for choice. The selection is large – as are frequently the portions as well. Putting 300 meals or more on the table in timely fashion is an everyday event as well as a challenge for the cooks. After all, the timing isn't all that's important; quality is also in demand in the canteen kitchens of the world. Chefs are supported in this by the RATIONAL SelfCookingCenter® whiteefficiency®. The combi steam oven prepares food quickly and easily using hot air and steam. Whether meat, vegetables or baked goods, it cooks everything to just the right point – at the touch of a button. The cook enters the desired results and then the device controls itself. Sensors make sure that nothing gets burned: They detect the size of the food being cooked and the amount of steam added. They check the cooking process up to 60 times per minute and adjust the temperature, cooking time and cooking chamber atmosphere. Moreover, this has the positive effect of enabling the chef to use 95 percent less fat when preparing

Alternating running direction Since 2004, motors from ebm-papst have been providing optimum air distribution in the cooking chamber. “Previously we used an asynchronous motor with frequency inverter,” reports Michael Schmidt of Strategic Purchasing at Rational. “Today we work with GreenTech EC technology. This is qualitatively better; in addition, it also saves costs by means of its high efficiency.” A corporate restaurant uses 60 percent less energy by using the combi steam oven. The Mulfingen-based developer met the special customer requirements for the new series by completely redeveloping the existing motor. Gerhard Gauß, Department Manager for project engineers Germany at ebm-papst, remembers, “In principle, we modified everything

“Today we work with GreenTech EC technology. This is qualitatively better; in addition, it also saves costs by means of its high efficiency.”

Michael Schmidt,
Strategic Purchase RATIONAL

except for the ball bearings – and those we are replacing now as well,” he says with a laugh. The most important innovation: Previously the impeller in the cooking chamber always rotated in one direction only, meaning that optimum air distribution was attainable only with mechanical flow aids. “Now we use an impeller that moves air in both directions,” explains Gauß. “The motor changes its direction of rotation every minute;

consequently, we achieve better air turbulence without additional flow aids and attain a more uniform cooking result.”

Motor with brains The service life of the components was particularly important to RATIONAL. “After all, here we are talking about 30,000 to 40,000 hours in ten years,” says Schmidt. The EC motor withstands ambient temperatures of 75 °C and even runs smoothly while withstanding grease and chemical cleaning agents. “That is important above all for the shaft, since it comes into contact with the cooking chamber,” continues Schmidt. Additionally, the motor does not require much space: It supplies the same output despite its reduced size due to its better efficiency. “The energy efficiency of the EC motors helped us make it even more compact,” says Gauß.

The technology presents advantages for control options as well. If things get too hot for the motor due to extreme ambient temperatures in the kitchen, it does not simply switch off. Instead it reduces speed and power. It does not stop completely unless the heat is not abated by this approach. “By means of this ‘power derating’, the device remains usable even under extreme conditions,” emphasises Gauß. And while the previously used asynchronous motor required 16 voltage versions, the EC motor from Mulfingen does the job with only two. This is made possible by a wide voltage input of 100 to 240 volts. Different power frequencies are no longer a problem; one device for normal applications with single-phase current and a second for three-phase AC suffice.

Gas or electricity? In canteen kitchens round the globe, many cooks prefer working with gas instead of electricity. Therefore the SelfCooking-Center® whiteefficiency® can be selected with one of the two connections. Appliances heated with gas operate with two gas blowers from ebm-



Gerhard Gauß, Department Manager for project engineers Germany at ebm-papst, is happy about the successful combination of ebm-papst expertise in the SelfCookingCenter® by RATIONAL

Bottom: Straightforward and easy to operate: This makes everyday life in the canteen kitchen easier



See the combi steam oven working

papst Landshut. They generate the correct gas-air mixture for optimum combustion with low emission values. “Depending on the size of the SelfCookingCenter® whiteefficiency® the gas blowers are used in various sizes and performance classes,” reports Gerhard Gauß.

“Annually we produce approximately 35,000 units of the SelfCookingCenter® whiteefficiency® and another 10,000 units of our CombiMaster® Plus,” reveals Schmidt. RATIONAL produces six unit sizes, beginning with six fan trays and a connected load of ten kilowatts and going up to steam ovens with 20 double plates and a connected load of 64 kilowatts. “Some of the large combi steam ovens have two motors installed,” says Gauß.

Well cooled In all of the appliances a diagonal fan from ebm-papst St. Georgen provides cooling of the standard electronic devices in the installation space. Moreover, the work environment of the kitchen also places particular demands on the cooling units. Grease particles from frying pans and deep fryers accumulate in the ambient air. Therefore a filter in the rear panel of the combi steam oven protects the electronics from grease deposits. “However, the filter results in a higher pressure,” explains Gauß. “With convection alone ventilation would not be possible; we have to actively suck in the air through the installation space. This is why we have used a fan.” The compact devices from St. Georgen have been tried and tested in real-world use for this task with their high power density and a 230-volt direct connection.

As far as the inner processes of the combi steam oven are concerned, the cook notices nothing, but the result, in turn, is all the more evident – not just in the cooking itself. The device requires little space, is energy-efficient and, since it is easy to work with, employees can operate it without special training, which saves on personnel costs. And perfectly prepared meals are all that make it to the plates, even by the hundreds. ○



Keys were yesterday

Small, powerful motors open up new paths in security entrance system Slim Lane

Barriers, gates, turnstiles, locks: automated access control is a part of our everyday life. One of the market leaders in this field is US-based Auto-

matic Systems. For over 40 years, the company has developed and produced systems for control of access for pedestrians and vehicles. This in-

cludes paid access such as to public transport or toll stations, facilities for monitoring an area for access to sensitive areas such as ports or indus-

“Slim Line combines a large throughput with advanced protection for the user.”

Thomas Gasparri, Project Manager Automatic Systems S.A.

trial spaces, and secured access for buildings or entrance checkpoints to grant access to authorised persons only.

In the Belgian subsidiary near Brussels, the new product from this family of pedestrian access came into being: Slim Lane. “This is an automatic security access lane with double revolving tempered glass door,” explains Thomas Gasparri, Project Manager Automatic Systems S.A. Slim Lane is an innovative security access system. “The revolving doors are really innovative for a system of its type: before, the doors opened to the left and right; with the Slim Lane, they revolve. It has become a compact and elegant model that combines a large throughput in both directions with advanced protection for the user.”

60 people per minute is what the system can allow through, although it is relatively small in design. Thus it has a low space requirement, but also requires extremely compact built-in motors. “For two years we have maintained an especially good relationship with the people at ebm-papst Benelux,” said the 27-year-old product manager. „They have supplied us with the ideal DC motors for the new system.” The motors open the glass doors of the access device. For this purpose, they have to be especially small and simultaneously high in performance. Thanks to their high efficiency, they need only little energy – an ideal solution for the versatile access system. In the meantime, ebm-papst is developing a higher-performance version of the current motor for future systems for public transport.

All possible security guarantees are offered by the Slim Lane, introduced in September 2011, and it possesses an especially effective monitoring system that functions on the basis of infra-red beams to prevent unauthorised access. Additionally, an electromechanical locking device prevents attempts by unauthorised people who are trying to get access anyway. An acoustic and visual alarm warns of such unauthorised conduct. “During the development of Slim Lane, we also paid special attention to the protection of users,” Gasparri emphasised. A dynamic, electronic protection system

and crush guard are complemented by stringent fire safety standards. In the event of a power failure, function remains via a battery. There are also Slim Lanes for many different application requirements. The system is also available in an extra-wide design for people with limited mobility. Moreover, there is a so-called “twin design” with which multiple access points can be installed within a limited space. Gasparri is proud of the result that the team achieved: “We have developed an especially effective, compact and successful product that will bring great success around the world.” ○

**Thomas Gasparri,
Project Manager
Automatic
Systems S.A.,
inspects Slim
Lane components
in Automatic
Systems’
production**





Group photo with Air-On® (from left to right): ebm-papst Sales Engineer Uwe Rupertus, Dr Stefan Heule of Air-On and Werner Schneeberger, Managing Director of ebm-papst in Switzerland

THE ALL-ROUND TALENT

The single-room air-conditioning unit from the Swiss start-up company Air-On creates a healthy room climate – and is tremendously energy-efficient and quiet to boot

Building renovations and energy-saving houses have a giant potential for contributing to climate protection. However, many concepts today stop at insulating the residential space as best as possible. This is where the Swiss start-up company Air-On AG gets started and offers what so far has been a unique climate control solution, which takes into account not only the energy-optimised building, but also the people.

The Air-On® single-room air-conditioning unit is a genuine all-round talent, which regulates the three essential factors for a healthy room climate, from temperature, to humidity, to CO₂ content. To achieve this, the air-conditioning unit masters five functions at once: heating, ventilating, purifying air, dehumidifying and humidifying. And since the device operates only when one of the three room climate factors is not in the nominal range, it also saves a whole lot of energy.

The secret to these savings is in the CO₂ measurement. For air-conditioning devices without a CO₂ sensor, fans have to provide an uninterrupted air exchange. If there is not much carbon dioxide in the air, however, then a substantially smaller air exchange quantity is sufficient. And when less air has to be moved, less power is used. Also, Air-On developed its own filters, which drive in the same direction. Just how well these purify the air is made clear by Dr Stefan Heule, the manager for filter technology and aerodynamics at Air-On. In the laboratory he eliminated the particulate matter of a burning candle using the Air-On® device within a short time and produced quality approaching that of a clean room. "A candle is a real nanoparticle canon, but the device filtered out most of the little particles," says Heule, describing the experiment. This is true thanks to a unit consisting of a coarse filter and an electro-

filter, which also removed particulate matter to an impressive degree under real-world conditions in a prototype test in a housing area. We speak of "excellent" room air quality when there is a maximum of 10,000 nanoparticles per cubic metre. In the test residences the devices permitted no more than approximately 1,500 particles. Moreover, an active carbon filter removes ozone and unpleasant odours. "If your neighbour starts up his fireplace, your home will not be dominated by a smoky bonfire atmosphere."

The Air-On® air-conditioning unit has only three moving parts – centrifugal fans from ebm-papst St. Georgen. And these are responsible for moving the air through the filters. Two smaller RER 125 fans draw the outside air to the inside and push the used room air to the outside via a heat exchanger. The large Type RER 160 fan controls the total volume flowing from the device into the room. Air-On searched for a fan supplier which could meet the high quality and service life requirements. "Only one supplier came into consideration," emphasises Heule. The first contact with ebm-papst took place in 2007 via the Swiss subsidiary in Oberhasli in the Canton of Zurich, and the appropriate fan models were also quickly found.

However, Heule frequently travelled to the German location in St. Georgen for the technical optimisation of the fans. In return, several engineers from ebm-papst made a visit to the little company in Cham am Zugersee. "So much customer care really impressed us," Heule admits. "We were convinced of the application from the beginning," emphasises

"So much customer care really impressed us."

Dr Stefan Heule, Manager for filter technology and aerodynamics at Air-On

Uwe Rupertus, Sales Engineer in St. Georgen, with respect to the joint development. “Therefore it was a matter of course for us to work together at full power towards success.”

The fans are inherently tremendously energy-efficient, thanks to their good controllability, and also permit low power input at constant speeds over a long time period. This is significant above all in night-time mode, when the fans have to run as uniformly as possible, since noise changes can be particularly unpleasant for those sleeping.

“During our visits in ebm-papst’s test lab, our primary concern was noise,” explains Heule. “We gained very convenient access to the professional test environment there.” And he adds with a grin, “Then, however, the dialogue during development took a typical course: We said, ‘It is still too noisy.’” Rupertus explains how ebm-papst was finally able to accomplish the prescribed level of 22 decibels in night-time mode, “Use of the RER 160, which runs in comparable applications, was critical. It has a special commutation, in order to keep the noise level as low as possible. Nevertheless, we had to develop the motor software further to achieve Air-On’s specifications.”

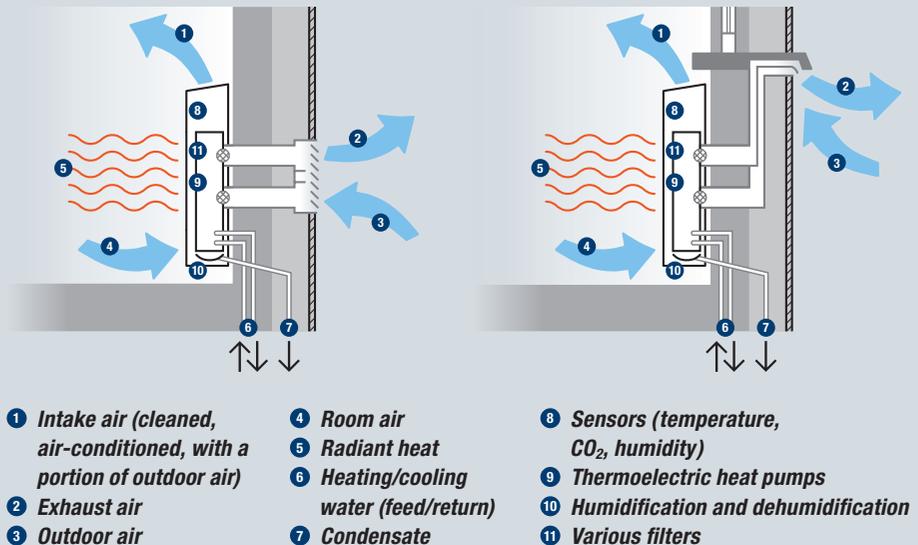
Maximum efficiency is one thing, user-friendliness is another. Air-On thought about that also: The device is not only easy to install, it is also self-regulating. The user has only to clean the filters from time to time. This is why the Air-On team made their self-developed coarse filter and electrofilter unit dishwasher-proof: Open the cover, take out the filter unit, put it in the dishwasher – done. ○



Improving the optimum: The trio works together closely during development. Bottom: Dr Heule presents the cover that protects the unit of sharp edges and dust until start of operation

An in-depth view of the air-conditioning unit

The Air-On® single room air-conditioning unit combines five functions at once: heating, ventilation, air purification, dehumidifying (gentle, active cooling as an additional function), humidifying. Moreover, two different installation variants are currently possible: Air conduction directly through the facade or below the weather shield.



The end of dependency

The plastic strengthened by wood fibres, “epylen”, is the first step towards sustainable biomaterials for ebm-papst

Companies are trying to escape climbing oil prices with products made from renewable resources. ebm-papst is also on this path – and with a so-called “bio-fan” they are celebrating their first successes. “Bio” because the wall ring of the ESM energy-saving fan is made from a new material: epylene. This composite material is made of up to 50 percent wood fibre. “Customers have reacted very positively to it,” emphasises Gunter Streng, Head of Development Product Range A at ebm-papst in Muldingen. His team tested over 50 biomaterials. It became clear from the tests that the material now being used possessed the best characteristics for static components like the wall ring. The company requires durability and temperature stability for every material put to use. But “epylen” can do even more: CO₂ emissions and energy consumption are reduced by a third during production.

Away from fossil fuels “epylen” is the first step towards ebm-papst’s goal of using 15 percent sustainable materials by 2015. That is why the search in the R&D department for sustainable biomaterials is continuously ongoing.

However, Streng illustrates the central dilemma: biomaterials that can be used to manufacture rotors already exist. For example, a heavy-duty polyamide made partially with castor oil. “This would be an easy way to make ourselves look ‘green’ – but at a very high price,” Streng explains for consideration. The material is, first and

foremost, significantly more expensive than conventional materials and is thus uneconomical. And there is another, important rationale: “We want to free ourselves from dependency on oil by using biomaterials – without being tethered to something new.” Such as the limited cultivation of *Ricinus communis*, the castor oil plant. This is also a substantial reason why the wood for the materials being used now comes from sustainably forested, domestic forests.

Residual material instead of competition But this is not the end of the discussion for ebm-papst, since wood resources are in high demand. They are assumed to offer solutions in a wide variety of areas: as a means of CO₂ storage, as building materials, a fuel, and as a pristine recreational area. ebm-papst does not want to steadily exacerbate this competition situation with their use of biomaterials.

The goal in the end is to use 100 percent sustainable organic resources, which are priced at a level the market can bear. For Streng there is only one solution: “Ultimately we want to use organic raw materials that are defined as residual material.” A good example for that is lignin, which is a by-product of paper production and is normally simply burned. “But we’re only a little bit away from making a usable material from it for our own use.” By 2015 that will have changed. ○



See the fan
made of
biomaterials
working

Centrifugal + axial = diagonal



Diagonal fans from ebm-papst ensure a good climate in the Rittal control cabinet

It is crowded in the control cabinet – and it gets hot. More and more electronic components have to find space in there. Due to the heat given off, hot spots of up to over 90 °C exist. Sensitive electronic components have their service life significantly limited or, in a worst-case scenario, are destroyed by the heat. Filter fans take care of the needed cooling. They are composed of a fan and a dust filter that prevents dirt particles from getting into the cabinet. Underneath, embedded in the door of the control cabinet, the filter fan blows cold air towards the inside. It absorbs the heat, causes it to rise and sends it back out through an air exhaust grille.

High-performance cooling In the filter fans of control cabinet technology supplier Rittal, the axial fans transport the air from outside to inside. “These axial fans have their optimum operating range in low static counterpressure, where they deliver relatively large air volumes,” explains Thomas Heli, responsible Head of Development Product Range EA-2 at ebm-papst in Mulfingen. Should resistance increase, for ex-

ample because of a dirty filter mat, the efficiency decreases: the flow breaks off at the impeller and there can be turbulence. “This makes the fans inefficient and noisy,” says Heli. Together with Rittal, the developers at ebm-papst sought a new solution. The result: a new diagonal fan series, special for the TopTherm filter fans of the leading worldwide system supplier Rittal. “For the user, a high and constant air performance is particularly important”, explains Christine Ronzheimer, product manager and project manager for air-conditioning at Rittal. “Aside from that, the fans should be simple to install without tools and be service and maintenance-friendly as well.” With these specifications, the teams from Mulfingen and St. Georgen went to work: “We quickly recognized that the axial fans used for this application are not the optimal solution. The compact diagonal fans are much better suited to this,” states Heli. They unite the positive properties of axial and centrifugal fans. “The air flow direction of the diagonal compact fan is, as with the axial compact fans, mostly axial. The pressure build-up is, however, increased by the additional centrifugal exhaust component.”



Through this diagonal exhaust, the interior of the control cabinet is simultaneously cooled and the build-up of hot spots reduced.

Energy-saving and service-friendly The diagonal fans have further advantages: In the event of a dirty filter mat, performance degradation is significantly lower despite the higher counterpressure. The mat has to be changed less often and the maintenance intervals are lengthened. Moreover, the new fans save a significant amount of energy – above all, when they are controlled over an additional thermostat: “The control cabinets will be cooled significantly more effectively with the new diagonal ventilators. With an additional regulator it can have a significantly shorter run time and an up to 48 percent reduction in energy consumption,” Ronzheimer emphasizes. Heli makes clear what that means in the real world: “In a production hall with 200 filter fans, you would save 26,600 kilowatt hours and about 3,000 EUR in energy costs annually. Viewed over a usage time frame of five years, that amounts to 15,000 EUR.”

In order to connect the diagonal fans to the filter frame, the fans are integrated in an innovative housing which, along with the motor bracket with integrated guard grilles, also includes the receptacle of the connection terminal and an integrated bayonet coupling. Thanks to this bayonet coupling, the fan is quick to mount: position, turn – all without tools. The direction of air flow can also be changed without much effort. “The cold air should not just be pushed inward, otherwise the warm air has to be actively extracted by suction, and the direction of air flow has to be changed,” explains Christine Ronzheimer. “Up till now, this required great effort.” Now, the ventilator can be easily released via the bayonet coupling, turned 180° and re-installed. A further plus: “With the old fan, the terminal clamps were always fixed in one corner. In extreme cases, the customer had to wrap the supply around the entire fans,” said the product manager. “Now they can position the terminal clamp flexibly in one of four corners – they simply turn the fan.” Quick to mount, the filter fan then takes care of optimum cooling, even in fully packed control cabinets. ○

Rittal's Project Manager Christine Ronzheimer is very satisfied with the maintenance-friendly and efficient diagonal compact fans in the control cabinet



See the TopTherm fan and filters working



Visibility in traffic: LEDs are being used in ever more street lamps

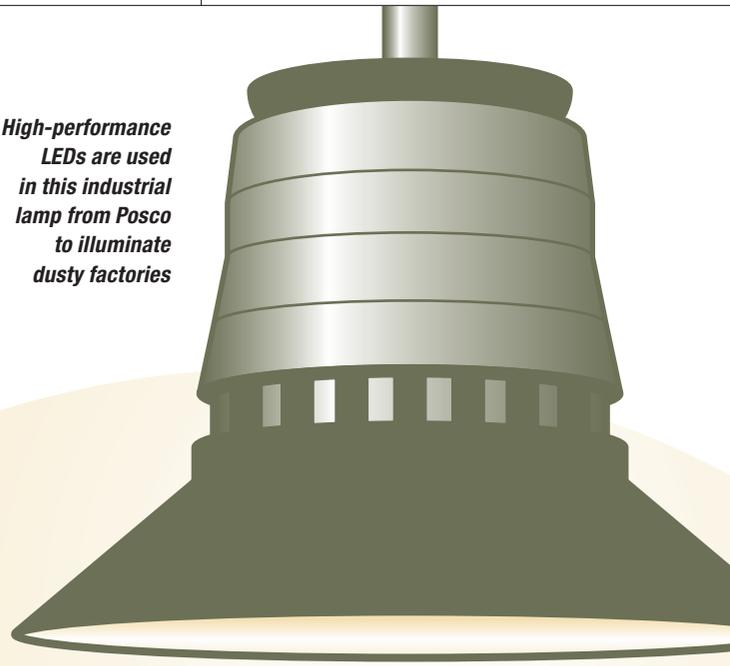
Small lights with big claims

Small, energy-saving and simply good: Anybody who wants to be taken seriously in the lighting technology field is switching to LEDs. With proper cooling, this also works long-term

LED technology is fully in line with the trend right now. We encounter little light-emitting diodes more and more in daily life. For good reason: LEDs are significantly more energy-efficient than light-bulbs or halogen lamps – even in energy-saving form – and even have longer service life. Moreover, they have an attractive appearance and can be integrated into modern designs in many ways due to their small size. But where there is light, there is not just shadow, but also heat. In order to dissipate this heat, manufacturers generally use cooling elements made of aluminium. “At high light intensity this strictly passive cooling quickly reaches its limits,” explains Jochen Wolber, Export Sales Manager Fans at ebm-papst St. Georgen. If the lamp is to shine more brightly, the cooling

element also needs to be enlarged to provide more capacity. “But for many users, this is out of the question,” said Wolber. After all, not only the design would be extremely limited by this, but the weight of a lamp would increase massively – both an absolute criteria for elimination for many applications. As it was in the case of Philips: the electronics firm is currently upgrading existing street lights throughout Europe to LED technology as part of a retrofit. In the existing housings of the lanterns, there are now new insides. The dimensions must not change at all. Therefore, the product designers decided in favour of working together on an active cooling variant with ebm-papst: a small fan dissipates the additional heat, and the cooling element retains its compact size.

High-performance LEDs are used in this industrial lamp from Posco to illuminate dusty factories



The core principle is well known, as cooling computer hardware functions in this manner. “That, however, didn’t help us much”, Wolber admits. “After all, these applications don’t have an especially reliable reputation on the market due to the existence of many cheap products.” In terms of durability above all, potential customers must first be convinced of the quality of ebm-papst products. But even the 90,000 hour service life of the street lamps required by Philips is fulfilled without problems by the axial fan implemented – even in the open air.

It affects industrial lamps even more. The Korean steel giant Posco hangs these in its plants. The dust whirling around does not just ensure that the LEDs with 17,000 lumens at approximately 230 watts have to light extremely brightly. Furthermore, the dust has partly magnetic properties and would quickly attack the electronics and bearings of the ventilation system without the necessary coatings. Working together with ebm-papst, the developers integrated a function in the fan to reverse the direction of rotation. If required the air flow could clean an integrated dust filter.

“Such customized developments are not an exception for LED technology, but rather the rule,” explains Wolber. “We can’t simply reach in

the drawer and pull out the finished fan.” Even applications that at first glance appear simple bring their own challenges. A series of spots from light specialist Zumtobel hang in museums and retail stores, for example. The ambience is, of course, much easier to cope with. However, these lamps have an overall round shape – the traditional square-cut fan housing thus had to be adapted to this form.

The variety of these applications shows how wide the field of applications for LEDs is. “And we find ourselves just at the beginning of the development,” emphasised Wolber. In his opinion, the market will grow even more significantly if the trend of energy-saving lighting spreads worldwide. ebm-papst estimates the growth in the coming years will be about 35 percent. ○



Since they hang in museums, spotlights from Zumtobel are not only bright, but also quiet



Dr Lutz Ramonat

Central R&D, Warehouse
Technology and Reliability
ebm-papst St. Georgen

Testing and calculating

Using different methods to determine service life

A realistic evaluation of service life for durable, electromechanical components like fans is an important deciding factor for users. Because manufacturers cannot test for decades before supplying customers, they rely on a mix of theoretical approaches and real-world values. The calculation and test procedures and the mix of both varies widely from manufacturer to manufacturer. This is why it is important to be able to evaluate the resulting specifications and values correctly.

Different weighting Two commonly used values are service life and reliability. However, these cannot be converted back and forth, as they have different impact on the failure performance of components. Thus the service life specifies the time period in hours up to the point where ten percent of the devices have failed. In contrast, reliability indicates what is known as the mean time between failures (MTBF) value – the average time when one device fails out of a group started simultaneously.

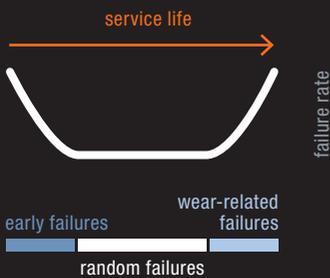
So-called classic failure performance says that a few components can fail at the beginning of operation due to faulty parts or installation errors. In the subsequent period, the devices endure long operating times with only a few, random failures. The MTBF value describes this range. Towards the end, wear then becomes noticeable and the failure rate increases again. The service life is delimited this way.

Test reduction In order to reduce the test period, manufacturers often operate a large number of devices over a period of six to twelve months. Then the service life

is extrapolated from the result using different methods. However, these methods provide incorrect results if the test does not include cases of wear. In that case the service life information turns out too optimistically.

The test period is often shortened by achieving accelerated ageing using external influences such as increased temperatures, temperature changes or shocks. The often unrealistic, ascertainable effects of temperature influences and their retroactive projection to normal operation are a disadvantage compared to real, long-term tests. For example, many computing models assume a doubling of service life at a temperature drop of 10 to 15 kelvin. If manufacturers use this extrapolation multiple times, absurdly high service life values quickly result. Here it is useful for the user to compare the service life information at high temperatures. If these are similar, but differ greatly at low temperatures, then the service life is not different, just the mathematical model that was used.

Hands-on evaluation Despite similar results in an accelerated service life test, the specifications of various manufacturers can differentiate in multiple ways. Thus, a conservative estimate of all influencing factors is essential for realistic specifications. However, long-term experience and constantly optimised arithmetic operations are absolutely necessary for such practical evaluations. ○



Bathtub curve

The steep drop-off of the early failure rate is followed by the long, stable phase of random failures, which slowly transitions to the steeply increasing phase of wear-related failures towards the end. Additional influences such as increased temperature, vibration or shock and chemical reactions due to cleaning agents or disinfectants, salt, dust or steam influence the failure rate and the shape of the curve as well.

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Trade fairs

Nordbygg, Stockholm, 20–23 March 2012
Mostra Convegno, Milano, 27–30 March 2012
ISH China / CIHE, Beijing, 4–6 April 2012
China Refrigeration, Beijing, 11–13 April 2012
Hannover Messe Industry, Hanover, 23–27 April 2012
ISK-SODEX, Istanbul, 2–5 May 2012
ARBS, Melbourne, 7–9 May 2012
Frigair, Johannesburg, 14–15 August 2012
InnoTrans, Berlin, 18–21 September 2012
IAA Commercial Vehicles, Hanover, 18–27 September 2012
Chillventa, Nuremberg, 9–11 October 2012

Our complete trade fairs dates: www.ebmpapst.com

Events

17. ebm-papst Marathon, Niedernhall, 9 September 2012

Sign up at www.ebmpapst-marathon.de

Technology for further reading

Are you interested in technical data, developments and products? The current issue of our sister publication tech.mag once again features a wide range of technical articles:

Development trends in fan technology

Energy-saving centrifugal fans in Fan Coil Units

Lab practice and calculating theory for service life evaluation

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The **tech.mag 1/2012** is available from the end of April 2012.

Contact our sales team or e-mail

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Warmth provider

The Bürgerhaus Landshut community centre is intended to be a contact point for everyone in the midst of a social trouble spot. ebm-papst Landshut is helping with the heating system

An address that is burdened with prejudice: in Landshut, the street of Porschestraße represents dismal apartment blocks, tight living conditions and criminality. An unemployment rate of 80 percent is a bleak reality of life here. About 90 percent of the residents have a foreign background – and few prospects.

The project from the Landshut Community Foundation, founded three years ago, promises a ray of hope. In the middle of the neighbourhood, ground was broken on October 1 of last year for a community meeting point. Anke Humpeneder-Graf, the Chairperson of the Foundation explains: “Our goal is to provide help for self-help. We do not see ourselves primarily as an information centre. Teenagers, parents, the elderly and children should have a place to get together, to have a conversation, to discover commonalities, to actively develop new interests and, thereby, to escape the isolation of their own four walls.” An ambitious goal in view of the multitude of problems.

But Humpeneder-Graf has already proved her endurance by recruiting sponsors. This is because the initiative’s 900,000 EUR project could only be realised thanks to the great generosity of local organisations. Numerous personal contacts opened doors for the dedicated woman – and she was even able to quickly convince Stefan Brandl, Managing Director at ebm-papst in Landshut. “Ms Humpeneder-Graf officially got me on board with

her dedication and enthusiasm and we just wanted to be a part of this great project.” The primary deciding factor for Brandl was the opportunity to create prospects for young people from the region. The community meeting point is being built on the location which had housed the FC Eintracht association’s headquarters up until now – about 300 meters from ebm-papst as the crow flies. “A win-win situation for everybody. The football association got a new clubhouse under our roof and we broke the ice with the people in the neighbourhood. The path to our door is well-worn thanks to the connection with the sporting club,” says the Chairperson happily.

ebm-papst is coordinating the project planning and installation of the heating system. “After our talk, I immediately began my search for additional supporters,” reports Brandl. He was able to convince Anton Oberpriller, who took over the installation of the system, and the Viessmann Werke. ebm-papst and Viessmann are sharing the costs for the 50 kilowatt gas condensing boiler and the 500 litre hot water storage tank.

The community centre plans to open its doors in the summer of 2012. “We are ready and are just waiting for the planners to call,” says Brandl. And he is very excited about how the project is developing, because it is not over for him after the installation of the heating system. “It’s easy for us to imagine getting involved more when it’s up and running as well, perhaps with a training presentation. Since, as a large employer in the region, we have a responsibility and would like to give everyone a chance – even the people on Porschestraße.” ○

Stefan Brandl and Anke Humpeneder-Graf inspect the progress of construction on the community centre

“ We are fans of sustainability. Therefore we at ebm-papst UK have created an educational campaign, under the GreenTech banner, which seeks to highlight how investing in EC technology can positively impact on the balance sheet, as well as reducing energy consumption and carbon emissions. We strongly believe that by helping our customers, and in turn often helping their customers, through a process of education and support, we can promote sustainability and economic growth. Recently we have seen a dramatic shift in the market, with more and more customers seeking information on sustainable solutions. But for us, sustainability also means to advance our local community in the long run. Being real fans we at ebm-papst support the four local football clubs Chelmsford City FC, Colchester United FC, Southend United FC and Leyton Orient FC as well as a charity for people with learning disabilities. ”



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The best fans
are from Essex

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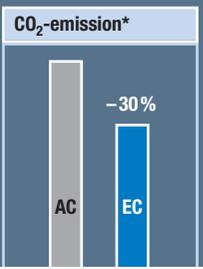
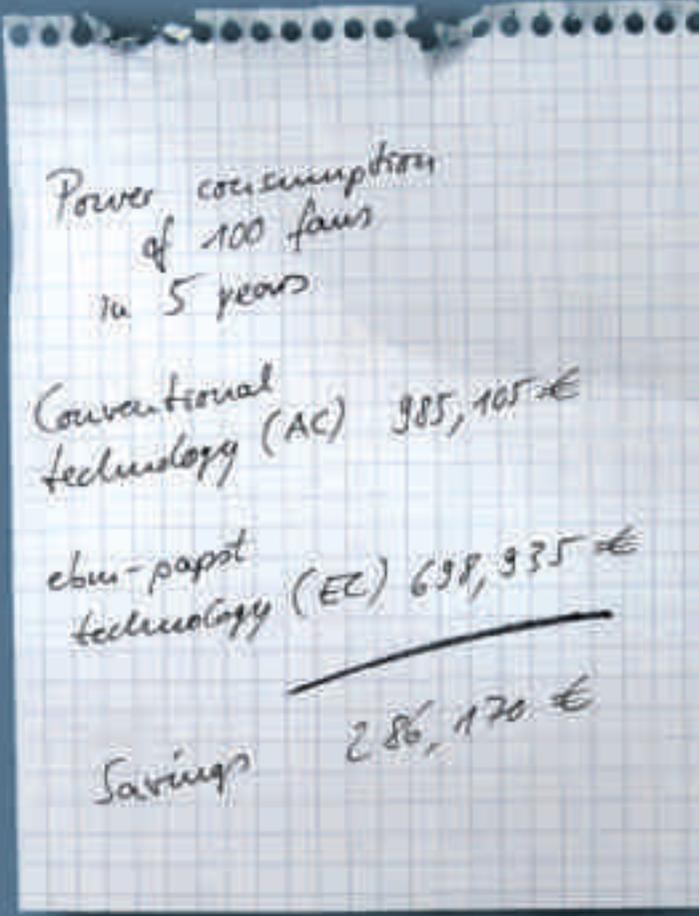
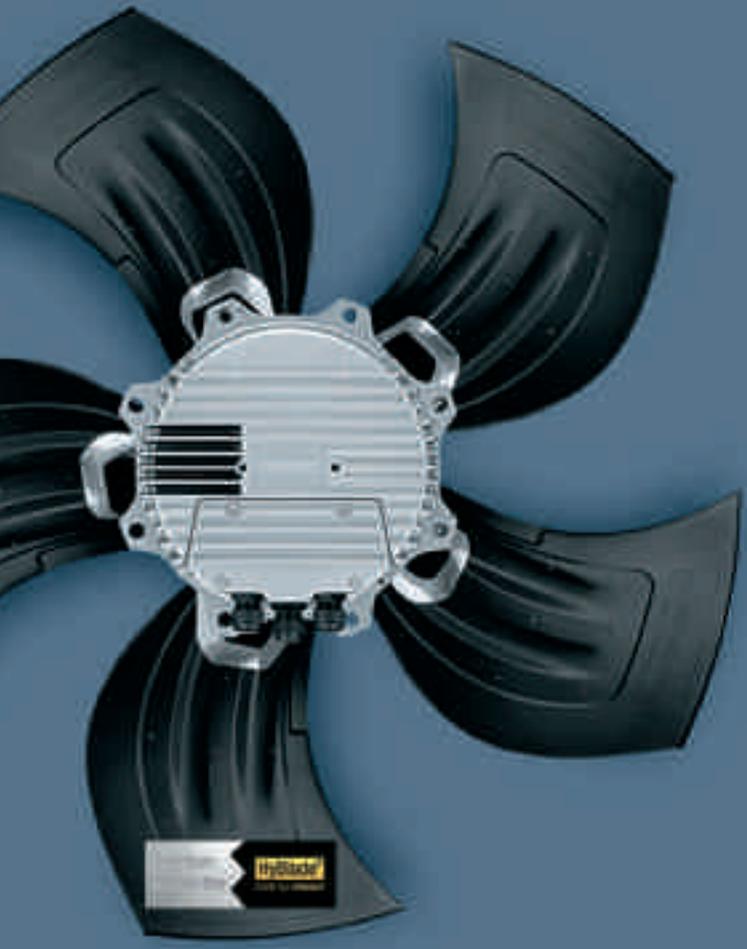


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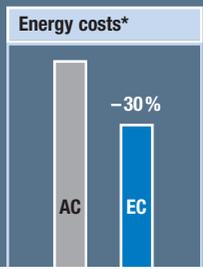


Ecology.

Economy.



* Detailed calculations on our website
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A calculation so simple it only takes one slip of paper: Have your finance staff present you with your energy costs for all your ventilation, refrigeration and air-conditioning units. From this amount, now deduct 30%. And there you are – this is how much you save from day one if you decide to use the latest generation of our GreenTech EC fans. For they not only need extremely little maintenance, they are also already a whole lot better than required by the tough ErP 2015 directives. And this is all there is to it. Almost. For what is not shown in the calculation is the considerable benefit for our environment due to the huge reduction in CO₂ emission, a positive side effect at no additional cost. For more information, simply go to www.greentech.info, and see how we fit your bill.



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