mag°

all about ebm-papst

01° 2010

GREEN INSIDE

What is behind the new GreenTech logo?

ebmpapst

“The green revolution is hitting the USA”

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A whole lot of green!

Thomas Borst
Managing Director Sales
Group Management

Dear readers, when picking up this magazine, you may have thought: "Well, that's a lot of green!" We felt much the same way when we examined our company's roots, values and success factors. We were a bit surprised, but thoroughly pleased to learn: ebm-papst is a green company, through and through. This is not for opportunistic reasons or because it is currently beneficial from a political, economical or social standpoint to portray oneself as being green. Rather, it is because green is at the core of our being — because our engineer's spirit is the pursuit of doing more with less. Because the company's heart beats faster when these solutions make customers more successful, create new markets and thus move the organisation forward financially. And because our company's goals and values are inherited from our founding families; they do not change from quarter to quarter. Over forty years ago, our founder Gerhard Sturm set forth the principle that every new product must be better and save more energy than its predecessor. Ever since, we have developed and lived out this green philosophy without necessarily thinking about it every day, and certainly without constantly putting it in the spotlight. With "GreenTech", we are making a statement that is more than a round green sticker. It does not stand for a handful of showcase products, but for an entire company and it's attitude. To find out more, read the cover story on page 10 and many other articles of this issue of our customer magazine — and learn from everyday collaboration with us. We look forward to working with you!

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360°

Ralf Sturm, Manager of HR Services, takes care of finding qualified and motivated staff

Where will the personnel of tomorrow come from, Mr Sturm?

The job market is undergoing major changes. Companies are confronted with new challenges in personnel policy. Ralf Sturm, the Mulfingen-based Manager of HR Services, explains how ebm-papst handles these challenges.

What is ebm-papst's personnel policy?

Our locations are in areas with a more rural structure and thus we have always been dependent on the ability to pursue a very active personnel policy. We achieve this, for example, by consistent realisation of vocational training courses and a variety of qualification programs. For this reason and others, ebm-papst has highly motivated employees with an exceptional bond to the company.

What are the biggest challenges today?

Industry is noticing decreasing numbers of applicants in the vocational training sector due to the trend to higher educational qualifications. Already foreseeable demographic developments will further reinforce this trend. For a company in a rural region, this means that the existing resources must be used even more consistently so as to secure our own young talent and thus the existence of the company. We have the advantage here that we have always had to win over our employees with criteria other than the attraction of a metropolitan area — and have done so with success. Especially in terms of co-operation and the way we personally interact with one another, we offer something that cannot be taken for granted.

How will young talent development be different in the future?

We will intensify our young talent development, but the content will not change significantly. In order to attract the required skilled workers even in a shrinking market, we will continue to develop and implement innovative vocational training courses and qualification programs in co-operation with other companies in the region. The close contact with the educational institutions and universities in the region that has developed over several decades is also very helpful in that regard.

News in brief

The Landshut location is among the prize winners of the Germany-wide competition 365 Landmarks in the Land of Ideas 2010 for the development of the Lambda-Constant gas combustion system. The official awards ceremony will take place on 11 May on the campus in Landshut.

The Distrelec ELFA Group has distinguished ebm-papst as a Preferred Strategic Partner for innovative product assortment policy, high quality, accommodating after-sales service and reliability. The company is one of Europe's leading catalogue distributors for electronic components.

The Chinese subsidiary of ebm-papst has received the environmental award for its EC motors at the International Energy-saving trade fair in Shanghai.

EC fans by ebm-papst are at work in the Canton Tower in Guangzhou, which with its 611 metres is the second tallest television tower in the world. They ensure that the climate control system of the giant tower operates quietly, reliably and energy-efficiently.

The 12th regional Youth research competition organised by ebm-papst in Künzelsau, Germany set a new record. With more than 160 participants, who presented approximately 80 projects, it is the largest such competition in the state of Baden-Wuerttemberg.

ebm-papst's founder celebrated a major birthday: Gerhard Sturm turned 75 years old in December.

ebm-papst's Australian subsidiary is sponsoring the great hopeful in field hockey, Emily Hurtz. Just 19 years old, Hurtz was the leading goalscorer of the national team in 2009.

Hans-Jochen Beilke in front of the camera of "ZDF Morgenmagazin"

Through the crisis and back

The ZDF TV network accompanied ebm-papst for two years

How are medium-sized companies in Germany getting through the crisis? This was one of the questions the German morning TV show "ZDF Morgenmagazin" wanted answered and thus monitored ebm-papst's development for two years. The summary can now be viewed on the company website.

The long-term report begins in August 2008 when the biggest problem was still the lack of skilled workers, passes through the phase of short-time work, and concludes at the end of 2009 already daring to express a relatively positive outlook for the future. After all, the fan manufacturer had expanded its leading position in the world marketplace for EC motors and EC fans even in the crisis. For this reason, Hans-Jochen Beilke, Chairman of the Board of Managing Directors, estimates that the company will fall just short of the sales goal for the current fiscal year, but expects recovery in the next.

Power for the Ural

Thermal power plant for Russian university

The Southern Ural State University in Chelyabinsk, Russia, is building a thermal power plant and ebm-papst is involved. Sixteen centrifugal fans from ebm-papst Ural, the subsidiary in Ekaterinenburg (which is approx. 200 kilometres away) rotate in the suction and air feed chambers of the four generators. The natural gas-fired plant, with 2.4 megawatts of electrical output and 3.2 megawatts of thermal output, is being started in two phases. Two generators have already been operating since the end of January. The other two are scheduled to go online in Summer 2010. There are already plans for an additional thermal power plant.

The generator hall of the thermal power plant in Chelyabinsk

The ebm-papst Indoor Football Championships for A-Juniors have already been hosted in Mulfingen **8 times.**
Here are the statistics of the previous tournaments:

1,151 The number of goals scored by A-Junior teams in the previous eight Indoor Championships. Average per tournament: **143.8 goals**

2004 and **2010** won by the same club —
the only club that was able to take the win home twice: **Eintracht Frankfurt**

150 volunteers help with set up and clean up at each tournament.

350 is the magical "fruit number". That is how many apples, bananas and mandarines the teams consumed on the weekend of the tournament.

At least **10 players** who have participated in the tournaments are now professional Bundesliga players. The best known example: **Marcell Jansen**

Hans-Jochen Beilke presents Jürgen Sturm with the DKMS donor certificate

Cells for the USA

Another bone marrow donor from ebm-papst

If your information is on file somewhere, you may forget about that after a while, but the German Bone Marrow Donor Centre (DMKS) luckily does not forget anyone! ebm-papst toolmaking employee Jürgen Sturm has the correct stem cells for a cancer patient in the USA. Sturm immediately donated stem cells in a hospital in Nuremberg. Hans-Jochen Beilke, Chairman of the Board of Managing Directors, personally presented Sturm with the DKMS donor certificate in recognition of this social commitment. Jürgen Sturm is already the second donor that could be identified as a result of the HLA typing campaign initiated by three trainees in 2007. Michael Keppner, an electrician, became a donor in 2008.

Driving clean and green

Employee receives environmental prize

Monika Sonntag, secretary in the Operations, Maintenance and Building Department, had a good idea: Why not make the CO_2 emissions a critical factor when purchasing new company cars? Her idea won the environmental prize from a regional citizens' action group, endowed with 1,500 euro. This idea and many others were initiated by an environmental competition through the employee suggestion system.

The Managing Directors also took to Ms Sonntag's idea and changed the company car regulations to target low CO_2 emissions. Only bluemotion models will be purchased for the pool vehicle fleet.

Monika Sonntag's idea was also honoured with a poster campaign

Training despite the crisis

79 trainees start at ebm-papst

Last autumn, 79 young people have started with their future in the world of work at the three ebm-papst locations in Mulfingen, St. Georgen and Landshut — in training or dual studies. The company thus defied the trend in the economic crisis. "We are conscious of our responsibility to young people and the region and thus place as much emphasis on our training programs as ever, despite the economic crisis," emphasises Hans-Jochen Beilke, Chairman of the Board of Managing Directors. Accepting students into a concrete employment relationship after they complete the training at ebm-papst has been a stated goal at all three locations.

Fifteen trainees began their career at the Landshut location in Germany's Lower Bavaria region; in St. Georgen and Herbolzheim a total of 21 young adults began their employment. In these two plants in the Black Forest region, 19 started as industrial/technical trainees, one as Inventory Management Specialist and one as future Bachelor's of Engineering. In Mulfingen, an Orientation Week started off training for 43 trainees and students of the Co-operative State University and co-operative degree program in Electrical Engineering.

The new trainees in St. Georgen

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

DIRECTIVE COMPLIANCE

features the size 15 motor platform for household refrigeration appliances. It easily complies with the new EU eco-design standards of tomorrow, today. It is half the size compared to conventional solutions and combined with the fan, it is extremely energy-efficient, powerful and quiet. These features can be observed, for example, in the new Siemens CoolConcept refrigeration line. In this line, a compact size 15 motor rotates the fan in the NoFrost blower — and makes unwanted manual defrosting unnecessary.

Individual module

The ECI 63 series sets benchmarks for modern small drives for automation, laboratory technology, medical technology or packaging technology: It is the first high-efficiency motor size of a module assembly that can be configured and assembled according to the user requirements.

GreenTech

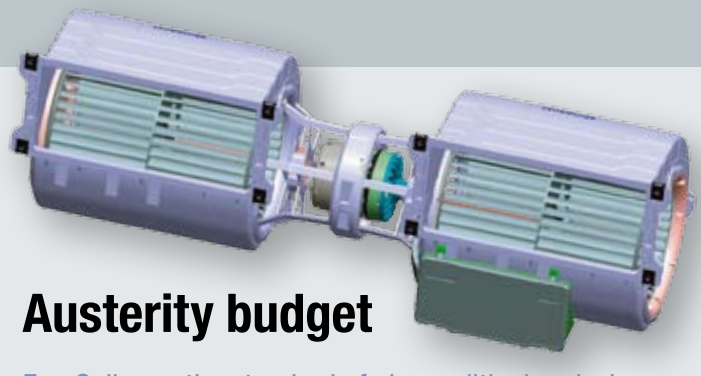
Eco-friendliness and sustainability have always been at the core of our thoughts and actions. Now we have coined the ultimate expression: GreenTech. More information about GreenTech is now available on www.greentech.info.

FROM COLD TO WHITE

Following its triumph in refrigeration and air-conditioning technology, EC technology is now also moving into what are called “white goods”. Existing blowers in range hoods can be replaced by new EC blowers one to one. Then, they consume less energy, are significantly quieter — and the speed can be adjusted continuously.

RadiCal(ly) new!

Just the name of this new centrifugal fan promises massive changes: The RadiCal offers unrivalled low consumption — and pays for itself quickly for that reason. It requires up to 40 percent less energy compared to its competitors. Moreover, the small rebel with the innovative current design was also more than 6 dB (A) quieter when tested in a heat pump.



Austerity budget

Fan Coils are the standard of air-conditioning devices and are introduced quickly all over the world. There is a great potential for energy savings using intelligent technology. One example here is the new centrifugal fan series from 40 to 250 watts. They are extremely frugal, extremely silent, space-saving and easy to install.

The green company

Green has never been so fashionable.

It stands for being environmentally friendly, innovative and ready for the future.

No wonder, then, that green is the favourite colour of many marketing departments.

With the new GreenTech label, ebm-papst is also presenting itself as an all-round green company.

Here is a look behind the scenes.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Radiale Ve
ZERTIFIK
Die
DQS GmbH
Deutsche Gesellschaft zur Zertifizierung von Managementsyst
bescheinigt hiermit, dass das Unternehmen
ebmpapst
GmbH & Co. KG

Markus Mettler is Technical Operations Manager at ebm-papst in Mulfingen, Germany. He also serves as the location's environmental officer. This dual role is extremely logical: "When the environmental officer has a good idea, the operations manager can implement it straight away," the native of Germany's Hohenlohe region relates with a smile. Mettler has free rein to implement environmental measures if they also make economic sense. He started right at the company's own home base. Working together with an innovative heating contractor from the region, the heat distribution system at the location was optimised in terms of its energy consumption. This has provided a savings of some 600 tonnes of CO_2 per year. However, Mettler is not yet fully satisfied: "We still have to deal with the heating boilers. The last one was built 27 years ago and we still have lots of capacity, though our heated space has increased almost threefold since then. Years ago, systems were sized quite differently." This is in sharp contrast to the new green plant right around the corner in Hollenbach. There, the capacities were designed to match the area and type of use exactly — to the last detail. Where do the company's high environmental standards come from? "We work in a wonderful cultural landscape in which others go on holiday. This environment has an impact on us, and we know that we have a great responsibility to maintain it."

Thinking, calculating, acting. "First: product design that conserves resources. Second: manufacturing that conserves resources. Third: energy-efficient, low-noise operation. This has become our principle for development," emphasises Dr Bruno Lindl, Managing Director Development. And this is true even if it seems unreasonable at first glance. Such was the case in 1990: "Electricity prices were low and semiconductor prices were high, but we kept focusing on our efficient, electronically controlled motors and fans and continuously developed them. That is now paying off." Lindl believes that the greatest potential savings lies in a comprehensive view of the complete system at the customer's facility. Here, the largest increases in efficiency are hidden. "Discovering this potential and realising it together with our customers is our clear competitive advantage."

"Comprehensive thinking means clear competitive advantages." *Dr Bruno Lindl*

Gunter Streng, R&D Manager for Product Division A, illustrates how these ambitious goals are implemented when developing new products, offering the example of the HyBlade® axial fans. The blades are no longer made entirely of aluminium, but rather of an aluminium insert sprayed with fibre-glass-reinforced plastic. In a study, the developers had a life cycle assessment carried out of the new fans in the manufacturing phase — from bauxite mining to die-casting to the finished product. The result: "For a production run of 100,000 HyBlade® fans, the savings is 9,000 megawatt-hours. This roughly corresponds to the energy consumption of 3,000 households." This calculation does not even include the large potential savings provided by EC-powered fans in operation. However, the same holds true for other products of the company's three German locations, including the condensing boiler technology from Landshut (see page 16).

Left: One for all — Markus Mettler is Technical Operations Manager and Environmental Officer at the Mulfingen location.

Right: Gunter Streng, R&D Manager for Product Division A, and Managing Director Development Dr Bruno Lindl inspect a newly developed impeller geometry.

“I don’t like waste — at home or at work.” *Robert Wasmuth*

Particularly energy-intensive environmental tests must be passed by a newly developed product. In the factory in St. Georgen in Germany’s Black Forest region, Robert Wasmuth and his colleagues test the service life and reliability of new devices. They do so using test cabinets that expose the devices to extreme temperature fluctuations, for example between -40 and +120 degrees Celsius. “In the past, electricity has been used for heating and cooling. Because the requirements have become more stringent, we found a new way to cool,” explains the Manager of Production Qualification and Testing. Since 2007, Wasmuth has used the firefighting water reservoir, fed by a natural source, for a cooling circuit to cool the climatic test cabinets. In addition to the water reservoir, which has a 300 cubic meter capacity, a heat recovery system was installed as a second step to feed excess heat from the cooling circuit into the heating system — thus killing two birds with one stone: One benefit is that cooling the test cabinets requires only the electricity for the three circulation pumps. The second is that the heat given off by the cooling circuit supplies the heating system of the main administration building and provides part of the heat output during transition periods. Each year, the plant saves some thousand litres of heating oil. “I don’t like waste — at home or at work,” says Wasmuth of his motivation.

Similarly conscientious is Erwin Kammermayer. For eighteen months, the Landshut location’s Purchasing Manager has continuously increased the number

GreenTech

With the new GreenTech label, ebm-papst brings its philosophy of sustainability to succinct expression: pro-active development, environmentally responsible production, the highest energy efficiency, the greatest possible customer benefit. The company has already received numerous awards for its commitment to green issues.

Left: The environmental management standard shared by all ebm-papst locations around the world: ISO 14001

Right: Not a single grain of powder is wasted in the new ultra-thin layer facility. Thomas Kozok and Stefan Schmitt inspect the fluid bed module, in which the recycled powder is mixed with new powder.

A switch that pays off for everyone: Mettler, Schmitt and Kozok are as enthusiastic about iron phosphating as the assembly employees on the enamelling line. No more nasty smells, no more sludge full of heavy metals

of environmentally certified suppliers. Of some 350 series suppliers, 20 percent are already certified. "That may not sound like a lot at first, but we are adding to this number all the time, and all of the top suppliers comply with the ISO 14001 standard." Furthermore, the certification plays an important role in evaluating new suppliers. "We want to increase suppliers' awareness of our green technology strategy. Even if it does not make financial sense for everybody yet, it has enormous potential for the future. Certification is also a good reference for suppliers."

Markus Mettler also wants to raise awareness of green issues. The Technical Operations Manager gives presentations and serves on the board of Modell Hohenlohe e.V., a regional business association (see page 26). "Energy efficiency is my hobby," he says with a grin. Though Mettler gives up some free time to take part in Modell Hohenlohe's work groups and the "Energie Effizienz Tisch (EET)," an energy efficiency roundtable, his participation benefits the company. From the energy efficiency roundtables, he has taken away many ideas that were then implemented at ebm-papst, such as optimising heat distribution systems, compressor systems, lighting systems and production equipment. The projects that are now in place save approximately 500,000 euro in energy costs each year.

The engine of savings lies in production, as Mettler and his colleagues in the environmental team have discovered. The prime example: the new ultra-thin layer (UTL) powder coating facility, which has been in operation since January 2008. This is currently one of the most state-of-the-art methods on the market, as Production Manager Thomas Kozok emphasises. The two-storey enamelling line is in a separate hall and works with almost zero emissions: "We have a 100 percent powder recovery system in place." The powder that does not adhere to the workpiece — which is some 60 percent — is completely extracted, recycled and fed back to the process. The heat given off by the enamelling oven in the facility's upper storey is used to dry the parts after pre-treatment. "We want to lower the enamelling temperature significantly from its current level of 200 degrees Celsius and are working closely with powder manufacturers to do just that," Kozok relates. Even today, the cooling effort has been decreased greatly, which also benefits the assembly employees at the plant. There, tropical temperatures once prevailed, but today the area no longer even needs air conditioning.

A clean coup was accomplished in Mulfingen, both in powder coating and cataphoresis coating: the switch from zinc to iron phosphating in surface treatment. This saves money, hazardous substances and nerves, as Supervisor Stefan Schmitt knows from experience. "The zinc sludge was nasty stuff indeed, chock full of heavy metals. We used to have to clean the entire zone, including the pipes, with acid every four weeks!" The advantages are particularly dramatic for cataphoresis coating, in which conversion coating using Oxsilan, an organic silicon-hydrogen compound, takes place. Unlike zinc phosphating, this works at room temperature, and thus does not require a heated bath, which keeps the 5,000 litres at a constant temperature of 50-70 degrees Celsius. This not only allows the heating energy to be saved, but also makes it unnecessary to use 30 hazardous substances. The wastewater volume could be reduced by two-thirds in the process. "The zinc sludge, which as hazardous waste required special disposal, could be omitted entirely," Schmitt is pleased to report.

Staff at the St. Georgen are likewise busy finding new ways to lower consumption of process media. The screw compressors at Plant 1 had long been a source of irritation to Martin Hug. The Manager of Plant and Building Maintenance had to quite literally purchase the compressed air production at a high price. For technical reasons, the compressors need a lot of time and energy before they reach the necessary operating state for supplying adequate compressed air to the workstations. He then discovered a control system for the compressors,

Tobias Arndt explains the advantages of the new reusable EPP packing materials

"Energy efficiency is the fastest and most cost-effective and sustainable way to reduce energy costs and greenhouse gases." *Markus Mettler*

gathered information from colleagues in other companies and online and had the system installed. This control system operates the compressors with run times that are as long as possible to reduce the number of cost-intensive start-up and idling phases. "The control system was fairly expensive, but it provides 10 percent electricity savings annually. In just under two years, the acquisition has already paid for itself," Hug relates with satisfaction.

The new packing materials are shown by Tobias Arndt, Assistant to Logistics Manager, with a broad smile: the EPP plastic lasts three times longer than Styrofoam and is also recyclable. "The corrugated cardboard box used to hold six units, but now we fit twelve fans into the same space." Because each element can be fit into the other, the packaging also saves a lot of space during return transport by lorry. This system provides nothing but advantages to the customer, ebm-papst and the environment. However, there is still vast room for improvement. "Of course, we approach customers and try to persuade them to use reusable packing materials," says Arndt, confirming the efforts. Idealism alone is not enough. Mettler, too, knows this well: "The customer always wants to know, in concrete terms, what's in it for them. At the end of the day, though, green intelligence always pays off. That is true today — and will be more so in future." ○

"Less energy consumed is the cleanest form of energy"

"For me, Green Technology primarily means that we concentrate on what is important, on our strengths," states company founder Gerhard Sturm. "For ebm-papst, environmental awareness is not, and never has been, a matter of extra diligence, but rather a matter of economic course. In my active days before retiring from the executive board in 2007 I made my successors take note of that, too. And therefore I am pleased to find that ebm-papst is successfully living this guiding theme. I am absolutely convinced that there is a lot more to presenting yourself as a green company than simply offering an economical product and paying a little lip service. It also needs conviction — one that is lived every single day. Take for example our new plant at Hollenbach. The savings realised here are about 90 percent compared to conventional technology.

Or take my own personal involvement with the Hotel Jagstmühle. The hotel generates its own electricity. I invested 100,000 euro in a new generator and turbine as well as an air/water heat pump for cooling and heating. Saving money by saving energy. As simple as that sounds, it demands the will to view the task as a whole and to solve the challenge in the best possible way.

When ebm was founded, we were driven by the challenge of being better than the competition. Every newly developed product should be technically and above all economically better than its predecessor. Lower consumption, that means less to pay, was a selling point even then, and in the future it will become even more important. That was the standard we set ourselves when we designed the first EC motor in 1970. But demanding more economical products inevitably means keeping the amount of energy and materials consumed during production as small as possible, and thus producing as little waste as possible — because waste also costs money.

Without constantly keeping an eye on the purely environmental aspect, ebm-papst has developed a green awareness from economic considerations. The company has not just retained this drive until today, it has even expanded it — at Mulfingen, St. Georgen and Landshut, and at other worldwide locations." ○

Pioneers in heating technology

Heat Transfer Products manufactures highly efficient heaters applying the latest technologies. And it is the first company in the world to employ an electronic control for gas combustion from ebm-papst

No sleep 'til Colorado: LambdaConstant is being tested in great heights

Saving energy starts at home. That is why Dave Davis also tests new equipment himself: "A LambdaConstant system has been heating my own pool for years now and it works superbly!" Davis has been Managing Director of Heat Transfer Products (HTP) since 2006. Ever since it was set up, the company has been committed to efficiency on the American heating technology market. The Massachusetts-based company started to develop and produce heat exchangers for heating boilers and for the solar industry in 1974. In the late 1990s, the company introduced condensing boiler technology from Landshut to the American market — triggering a development that has continued until today. HTP has since become a pioneer in the field of ultra-efficient water heating. "The people from Heat Transfer Products are true pioneers in heating technology," stresses Manfred Kratzer of Export Sales at ebm-papst Landshut.

Advancing technology At the turn of the century, HTP was carefully monitoring what the engineers at the Lower Bavarian ebm-papst location were developing: a control model that automatically adjusts the burner for different types of gas and which requires less installation time for commissioning. In 2005, a delegation visited Landshut and was quickly taken by the LambdaConstant system. "We are committed to European technology to make our products even better and to advance the American market. For that reason, we quickly indicated to ebm-papst that we were interested in working on and with LambdaConstant for use in our heating systems," explains Davis.

HTP spent the last three years conducting extreme field tests on 25 units in different parts of the USA to determine the efficiency, flexibility and robustness of the LambdaConstant system. Some units were fitted to a jeep and driven through the mountains of Colorado. Others were installed in log cabins and others were tested at camping sites. "We had units at elevations of 3,000 metres and we had units at sea level," explains Dave Davis. HTP engineers maintained constant contact with ebm-papst throughout the tests. "Both companies benefited from this," explains Manfred Kratzer. The learning effects of the extreme tests constantly made the LambdaConstant system even better. In return, the two models from HTP's Elite plus line were scrutinised and continuously improved at Landshut. The engineers regularly exchanged information in fortnightly telephone conferences, frequently even more often. "We were working on efficiency and on improving individual components right to the very end," stresses Kratzer. The small number of components is a characteristic of the LambdaConstant system that Dave Davis also highlights: a fan with a mass flow sensor, a gas burner, a control unit and a display. Done.

Flexible in all situations But what Davis likes best about the gas blower with electronic control is that it automatically adjusts to suit the type of gas and the gas content. That is especially important in some parts of the USA, where propane and other types of gas are used to increase the gas pressure. "There is a large market for this in the USA. You don't need measurements or additional jets or complex configuration work to convert LambdaConstant from one type of gas to another," stresses Davis. The adaptability is made possible by a mass flow sensor that measures the gas/air mixture flowing through the unit. This ingenious device makes LambdaConstant flexible for other influences such as differences in elevation and fluctuations in pressure in the piping system, as Dave Davis stresses. "At higher elevations, LambdaConstant has one great advantage: the heating systems work just as efficiently even at elevations up to 3,000 metres." The system doesn't just monitor the flow rate, it actually regulates the gas flow. This means that differences in pressure in long systems of pipes are no longer of significance. That is a characteristic that cannot be underestimated in the large private households typically found in the USA.

What HTP Managing Director Dave Davis likes best is that LambdaConstant is flexible

The engineers used a mountain shelter in Colorado as testing site for the new Elite plus boiler

Fine modulation Despite only having a few components, LambdaConstant has lots of innovation. Another major advantage of the system is the extraordinary modulation of 1:10. "We had to recognise that the ability of today's efficient heating boilers to respond quickly is both a blessing and a determent," explains Davis. If only a small load is demanded from a heating system, conventional burners with a modulation of 1:4 switch off. In order to supply hot water without delay when demand is increased, they work by storing the energy in an intermediate reservoir. The burner intermittently heats up the reservoir content, switching on, off, on again — and in doing so it burns gas unnecessarily. By contrast, the fine modulation of the LambdaConstant allows the burner to continue running at an extremely low level when demand is low.

Nobody else offers a system that is comparably innovative in the USA. Despite the difficult economic situation, there is a major movement in the USA towards the use of energy-efficient, low-emissions technologies. These ultra-efficient products currently enjoy a market share of about 12-15 percent. "Previous technologies have an efficiency factor of about 85 percent. Our products have a factor of up to 98 percent, and they are winning ever more market share," Davis is certain. But growth will be a slow process: "Ultra-efficient products are expensive in their initial procurement, and home owners don't have much money right now, so at the moment they are tending not to choose more efficient systems." However, the heating pioneer is convinced that the two Elite plus units that will be launched in mid-2010 will conquer the market in the same way as the first condensing boiler systems did 15 years ago. "LambdaConstant simply gives us a huge market lead over all of our competitors." ○

"LambdaConstant gives us an enormous market lead because it is extraordinarily flexible." *Dave Davis*

A gas blower with LambdaConstant

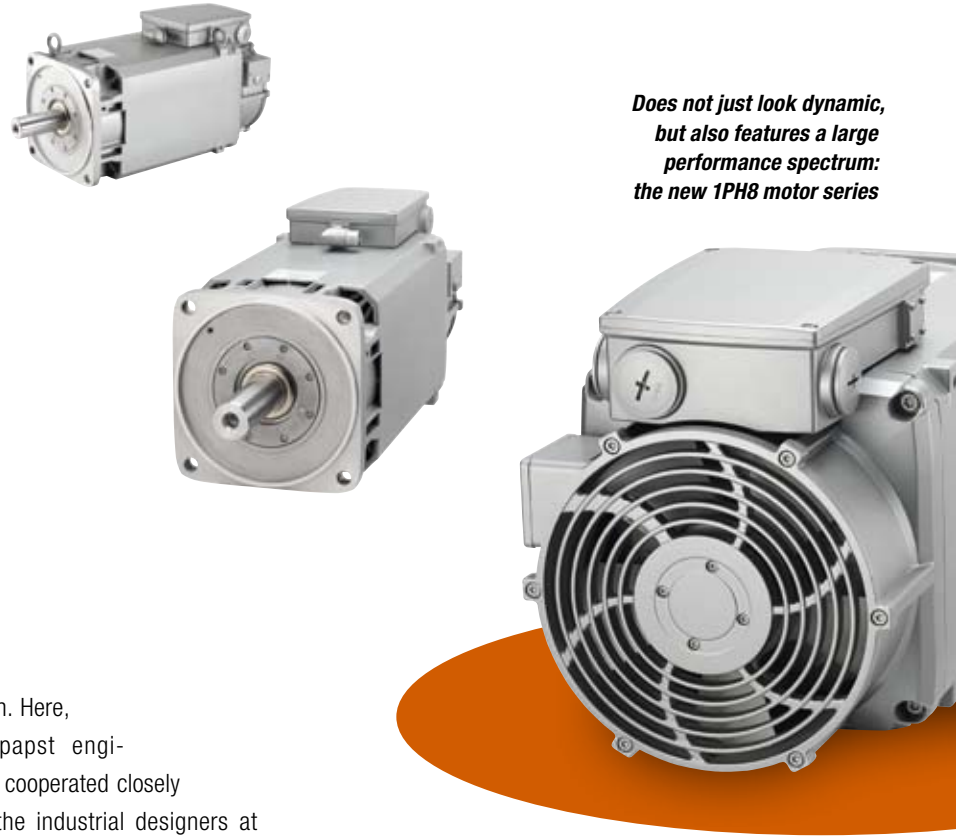
LambdaConstant

What is special about this system for condensing boiler heating systems is the combination of an **intelligent gas blower** and a control unit. A sensor measures the mass of the gas /air mixture and the combustion is automatically adjusted. In addition, LambdaConstant has a **modulation of 1:10**. This means that combustion can be reduced to just one tenth of full power, not just to one quarter, the level that is currently standard on the market. If only a small amount of heat is needed, the burner runs on low power instead of constantly being switched off and back on again. The system ensures **optimum combustion**, regardless of the type of gas, the elevation of the place of operation and the heat required.

Spot landing

In the new Siemens 1PH8 engine line, forced ventilation units supplied by ebm-papst provide for optimum operating conditions

Making the best even better — that was the challenge for the new line of Siemens motors. Since 1996, the 1PH7 series has rendered successful service as the primary drive for belt-driven and coupled tooling machines — around 270,000 of these units are cooled by fans from Mulfingen. At the end of 2009, the Siemens Industry division presented the successor, the new 1PH8 line. These advanced motors offer benefits that will inspire the user: excellent refinement and vibrations are the basis for greater precision, allowing better quality workpieces to be produced. The motor line is now more dynamic and has a broad performance spectrum, a high speed range and it employs a modular principle that makes it ideal as the standard drive for conventional tooling machine spindles. The motors can also be used in production machines such as textile machines, hoists, crane installations and test stands.



Does not just look dynamic, but also features a large performance spectrum: the new 1PH8 motor series

One of the modular elements for the 1PH8 is the forced ventilation unit supplied by ebm-papst up to shaft height 160. Experience with the predecessor version showed that precision was important when configuring the operating points for the new line of motors and that the design had to be adapted to accommodate the new motor generation. The result is a completely new forced ventilation unit. The air performance characteristic is precisely configured for the new motors and the units also work more quietly.

Motor layout, impeller design and blade setting have been optimised and the die-cast aluminium housings have been configured to suit the new motor design. Here, ebm-papst engineers cooperated closely with the industrial designers at Siemens. The forced ventilation units had to satisfy the design specifications of the lead design agency at Siemens. Together with the motor and more compact terminal box they were to be treated as one unit from a single casting. The electronic exchange of 3D design models made this harmonisation possible and led, for example, to curved struts on the guard grille, which visualises the dynamics of the drive.

Technically, the forced ventilation unit inspires not only with its optimal air performance characteristics and minimal noise emissions, but also with individual options. Apart from the standard flow direction “blowing over the motor”, a version “extraction over the motor” is also available. Plant engineers use this version as a variable drive for lathes in ultra-precise machining centres because extraction means that tolerance deviations caused by the thermal influence of the air flow are ruled out.

In addition, vibration-free versions, filter and pipe connections for extremely dusty working environments are in the process of implementation.

And the unit is certainly durable: the housing made of stable die-cast aluminium and fan vanes made of sheet metal ensure a mean service life of at least 40,000 operating hours. ○

No more stuffy classrooms!

Better air in classrooms and less expense for federal and municipal governments: Versatile ventilation systems from GLT Grohmann Lüftungstechnik make everyone happy

Currently, the German federal government and cash-strapped municipalities are looking for ways to save money. Ideally, this should be done without cutting services or failing to comply with directives from Brussels. The German Energy Savings Ordinance and EU energy efficiency directive require energy-efficient upgrades of public buildings such as schools and kindergarten. These projects could be an example of how the public sector can save money and increase quality of life at the same time. After all, the German federal government spent some 650 million euro for heat energy in 2007. State-of-the-art, highly versatile air-conditioning and ventilation systems provide enormous savings here — while simultaneously improving room air quality.

Grohmann Lüftungstechnik GmbH (GLT) of Forchtenberg, Germany offers practical fresh-air solutions with heat recovery that can be adapted to a wide variety of structural situations in a highly versatile manner.

Fresh air for clear heads The SLG series school ventilation systems work in a demand-oriented manner, adapting to the requirements. The ventilation is matched to the current use of the room, depending on the number of occupants and how they are using it. This is ensured by an integrated CO_2 sensor. If the system runs at the lowest setting, only the minimum base air exchange required for hygienic purposes is guaranteed. If the room air quality decreases, this signals an increasing CO_2 value and the system increases the air volume automatically.

The SLG school ventilation device from Grohmann with the two EC centrifugal fans and the heat exchanger

The central unit guarantees excellent reuse of the exhaust waste heat, as it works with a heat recovery percentage of up to 90 percent. If the outside air temperatures are very low, either an air mixture valve or an integrated hot-water heat register takes over the necessary heating of the fresh air. If the heat exchanger of the ventilation unit is located within the feed and return of a heating system, even more savings are possible: “The great advantage is that depending on the design of the classrooms, we do not have to use radiators in some instances,” emphasises Erwin Grohmann, the company’s owner. Moreover, the systems manufactured in Forchtenberg, Germany, guarantee that the children learn and play with clear heads, even if the outside air

“Government budgets save twice over the long term.”

Erwin Grohmann

Stuffy air in the classroom is a thing of the past: the children also benefit from the new ventilation system

quality is relatively poor. Filter systems of various performance classes ensure healthy room climate even near heavily travelled streets.

In the school ventilation systems, two EC centrifugal fans from ebm-papst Mulfingen provide the necessary intake and exhaust air flows — in energy-efficient operation. Even today, the fan motors exceed the requirements of the minimum efficiency classes that are planned to take effect in January 2011. They work with high efficiency of up to 90 percent and thus consume much less energy than the previously used AC motors at the same air performance. However, these potential energy savings are realised not only when operated under full load, but also primarily when operated under partial load. Where ventilation systems previously hummed so loudly that they made it difficult to concentrate in class, EC centrifugal fans eliminate this excuse for bad grades. They make no motor noise whatsoever, thus sparing the nerves of students and teachers alike.

Lasts for many classroom hours Government coffers benefit from not only the energy savings, but also other advantages of these plug fans. The previously common belt drive between the motor and fan is omitted. The electronically commutated external rotor motor is integrated directly in the lightweight aluminium impeller, which drastically reduces the installation dimensions and the weight of the device. This makes it substantially easier to fit the devices, already saving labour hours during installation. In addition, the system thus has fewer wear parts. For these reasons, and because of the materials used, the fans attain a service life of over 40,000 operating hours, which corresponds to running non-stop at maximum load and heat for four-and-a-half years. However, school ventilation systems usually run in partial-load operation and at lower ambient temperatures. “Lower service costs means that government budgets save twice over the long term,” emphasises Grohmann. However, Grohmann failed to mention a great disadvantage of his system: in future, the children’s hope for a day off from school due to bad ventilation will be in vain.

Three-wheel saver

Silently cruising around town with zero emissions. The Piaggio MP3 is the world's first hybrid scooter — and ebm-papst is on board

Piaggio's "three-wheeler" does look a bit unusual. But with two wheels at the front and one at the rear, the MP3 drives as smoothly as a conventional scooter — it is just much safer. And now it is also especially environmentally friendly. For the last year, this new vehicle concept — the world's first hybrid scooter — has been driving around cities and along open roads. The Piaggio MP3 Hybrid demonstrates that performance really is compatible with ecology. The economical combustion engine makes trips into the countryside a sporty experience, and in the hybrid power mode, the combustion engine needs up to one litre of fuel for 60 kilometres. That is 50 percent less than comparable vehicles. But the real highlight is the second heart that powers the Piaggio MP3 Hybrid: the electric motor. This can take the rider up to 20 kilometres through the city, silently and completely free of emissions. It is recharged from a standard mains socket. But the battery is rarely flat. The electric motor also doubles up as an alternator, recharging the battery while driving, as it gets slower and when it is braking. To enable the direct current motor to work with the power from the mains socket, the 230 volts are converted in a frequency inverter and then stored in a lightweight yet powerful and durable lithium battery. Two fans from ebm-papst ensure that the frequency inverter does not get too hot during this work.

Individual standard At the start of the development, Piaggio addressed the problem of obtaining a reliable, economical and quiet fan based on a standard model. After tests with DC brush motors had proven unsatisfactory, the world-famous scooter manufacturer approached the Italian subsidiary of ebm-papst. "Thanks to our experience in the automotive industry, Piaggio decided in favour of our EC technology," explains Paolo Pianazza, project manager at ebm-papst Italy. "The customer's wishes involved a number of challenges for us. While both models can be found in this form in the catalogue, the outer fan in particular required certain characteristics that were specially developed for Piaggio."

This fan conducts the heat away from the cooler plate of the frequency inverter. It is located under the seat in the direction of travel and is therefore exposed to moisture and dirt. A plastic housing and protection rating IP54 now protect the electronics in the fan from water, dust, mud shocks and vibrations. At the end of the day, the two fans are expected to last the full service life of the scooter. Moreover, a speed signal and a wiring harness to suit the customer's design had to be developed for Piaggio. The second model generates an airflow within the frequency inverter itself, and is able to work there up to a maximum temperature of 80 degrees Celsius.

Outstanding teamwork As soon as the scooter starts, the two fans run without interruption, and without consuming very much power. To ensure that the two fans cannot be heard, especially when the engine is idling, ebm-papst's engineers adapted the necessary airflow and ramp pressure to obtain an acceptable noise level. Pianazza stresses that the new scooter and ebm-papst technology are a perfect match. "Durability with good performance, good efficiency and low current draw are the benefits drawn from the fans in the Piaggio MP3 Hybrid. The scooter superbly fits our corporate philosophy of supporting innovative developments in the field of energy saving."

And there can be no doubt that the Piaggio MP3 Hybrid is economical: in the hybrid power mode, up to 40 grams per kilometre, carbon dioxide emissions from the scooter are 50 percent less than most of its two-wheeled companions. This is the achievement of the intelligent control system that optimally combines the combustion engine and the electric motor. If rapid acceleration is needed, or uphill gradients need to be effortlessly mastered, the electric motor will support the combustion engine to briefly boost output by up to 85 percent. Another example of outstanding teamwork. ○

Driving with the combustion engine the battery is recharged while braking. In the hybrid power mode the combustion and the electric motor work together. In the city the electric motor cruises silently and with zero emissions. Then the battery is recharged from a standard mains socket. Everthing is controlled by the Vehicle Management System (VMS).

Jan Bron, Eng.

Manager Business Development at Argus Vision BV, The Netherlands

Air to water heat pump system

What an intelligent control can mean to heat pump performance

More and more heat pumps are being fitted with efficient parts such as a DC compressor, an electronic expansion valve and/or an EC fan. The aim is to improve efficiency. However, the use of efficient components alone is not enough because intelligent control is also required to really make a difference.

Argus Vision heat pump control with advanced user-interface

The compressor in a heat pump system is the primary consumer of energy. A logical choice is therefore to use an energy-efficient DC compressor. The higher output of these DC motors immediately creates a major energy saving. The drive for the DC compressor does require what is called an inverter. A heat pump control with advanced inverter control ensures that the compressor is actually able to be efficient with the required energy and that the power of the heat pump can be controlled on the basis of the heat demand.

With an electronic expansion valve the size of the aperture is controlled by a stepper motor. On the basis of a number of temperature measurements the heat pump control calculates the optimum position for the electronic expansion valve. Proper control of the electronic expansion valve ensures that the heat pump is always able to find an optimum working point. As a result of this the efficiency of the heat pump is increased. An EC fan or EC pump in use generates an energy saving of no less than 60 percent compared to the commonly used AC motors. Via the heat pump control the speed of these types of fans and pumps can also be easily adjusted and, as a result, optimised.

An integrated weather-dependent control with room temperature compensation harmonizes the heat that the heat pump has to deliver to the actual internal and external temperatures. As a result of this the heat pump control is able to respond immediately to external temperature changes and adjust the capacity if required. This control contributes to the further efficiency optimisation.

Example of air-to-water heat pump appliance with energy efficient parts

Daalderop BV

For serviceability a good user-interface has become essential, especially with advanced heat pump systems. To start with, the user wants clear status information. Settings and historical data with regard to the appliance components — that are already controlled intelligently by the heat pump control — can now be easily displayed via the user interface. This offers the possibility of generating more specific fault codes.

For air/water heat pumps there are now many component options that can further reduce the energy consumption. To achieve optimum control of these advanced components the role of the heat pump control has become essential. Appliance expertise and integration of control functions have been the decisive factors in achieving a successful end product. ○

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Find us here: Trade fairs & dates

Trade fairs

Mir Klimata, Moskau, 9 – 12 March 2010
ISH China, Peking, 10 – 12 March 2010
Nordbygg, Stockholm, 23 – 26 March 2010
Mostra Convegno, Milan, 23 – 27 March 2010
China Refrigeration (HVAC), Peking, 7 – 9 April 2010
ARBS, Sydney, 12 – 14 April 2010
Hannover Messe Industrie, Hanover, 19 – 23 April 2010
ISK Sodex, Istanbul, 5 – 8 May 2010
Intersolar, Munich, 9 – 11 June 2010
FRIGAIR, Gauteng-Johannesburg, 8 – 11 September 2010
InnoTrans, Berlin, 21 – 24 September 2010
IAA Commercial Vehicles, Hanover, 23 – 30 September 2010

Our complete trade fair dates: www.ebmpapst.com

Events

15th ebm-papst Marathon, Niedernhall, 12 September 2010

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:

Added value for all
Energy-efficient EC centrifugal fan series for air-conditioning units

Robust and durable, yet energy-efficient and easy to install
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Refrigerator and freezer combination with more usable space and better access
Centrifugal fan for NoFrost system makes manual defrosting unnecessary

On the way to the future with EC technology
New blower series for range hoods

tech.mag 1/2010 is available from the middle of April 2010.
Contact our sales team or e-mail Corinna.Schittenhelm@de.ebmpapst.com.

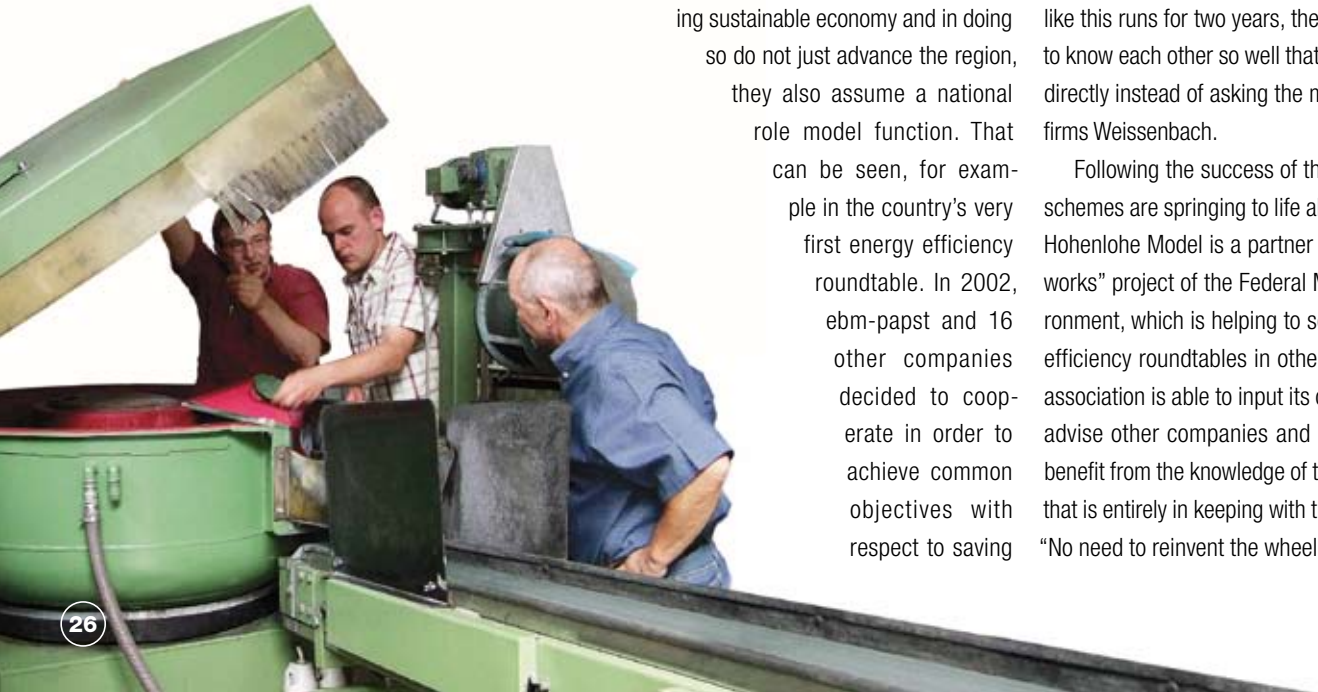
The learning network

Networking and cooperation enables the companies in the "Hohenlohe Model" to improve their environmental credentials and to advance the region

When plans were announced in 1991 to build a hazardous waste incineration plant in the Hohenlohe district, an action group was quickly formed. Local industry also supported the cause. To render the building of the plant unnecessary, 17 companies from the region, including ebm-papst, agreed to reduce their volume of hazardous waste by half within three years. This was the birth of the "Hohenlohe Model".

Since it was first set up, the tasks of the network have changed considerably. Kurt Weissenbach, Chairman of the association, describes the activities of the group: "We help our 180 members to help themselves. On the one hand, we provide support for various projects. On the other hand we have formed internal working groups that deal with the issues of waste, the environment and energy." For example, the association makes an exchange possible between students and companies. It supports the introduction of environment management systems and assists companies in attaining environmental certification. The association sees itself as a learning network. The objective is to network know-how in order to efficiently realise corporate environmental protection. General manager Jutta Bauer does not only see the cost factor here: "We have seen many cases that demonstrate that environmental protection can also make economic sense."

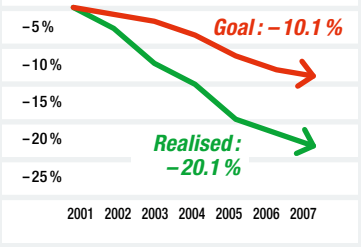
The work group "Environment, Safety and Health" visits a drag finishing unit at König & Meyer in Wertheim



The companies pool their ideas regarding sustainable economy and in doing so do not just advance the region, they also assume a national role model function. That can be seen, for example in the country's very first energy efficiency roundtable. In 2002, ebm-papst and 16 other companies decided to cooperate in order to achieve common objectives with respect to saving energy and reducing CO_2 emissions. A project engineer and a moderator supported the companies and gave impetus for the exchange of experience. Company representatives meet three to four times a year at one of the member companies to gain an on-the-spot picture of efficient implementation. Personal contacts were quickly established. "When a project like this runs for two years, the people involved get to know each other so well that they call each other directly instead of asking the moderator first," confirms Weissenbach.

Following the success of this approach, similar schemes are springing to life all over Germany. The Hohenlohe Model is a partner of the "30 Pilot Networks" project of the Federal Ministry for the Environment, which is helping to set up further energy efficiency roundtables in other regions. Here, the association is able to input its own experience and advise other companies and regions. These can benefit from the knowledge of their colleagues. And that is entirely in keeping with the network's slogan: "No need to reinvent the wheel." ○

Projected and realised energy savings 2001—2007



The energy concept

Nine of the companies that participated in the "Energie-Effizienz-Tisch", an energy efficiency roundtable, had set the goal of 9 percent energy savings over six years for themselves in 2001. In 2007, 20.1 percent were actually achieved. This corresponds to average savings of 110,000 euro per year and company or a reduction of CO_2 of 15,000 tonnes. The values are production and climate-corrected.

Robert S. Sobolewski
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“Working with ebm-papst Inc. and our 250 employees is very exciting right now: The US has awoken to the benefit of green products and energy efficiency — the market is finally embracing the solutions to reduce the energy footprint. Thus our EC-technology is a good match for those needs. The USA is still at an early stage of adopting green solutions. Especially when it comes to ventilation, airconditioning and refrigeration we’ve only touched the very beginning of what can be a large market. A few years ago we had all these products, but the market wasn’t ready. It’s fun to be part of this change and of the revolution in energy savings and green technology that is hitting the USA right now.”

What's in it? That much:

3.6 billion €

per year is what industry in Europe could save in energy costs by using EC fans.

Englisch 50008-7-8811 · PRCO-03/10-9,5

GreenTech stands for climate protection that pays off. As you may know, fans make for a tenth of the industrial power consumption in Europe. Consistent use of ebm-papst EC products featuring the GreenTech label can cut this proportion by 30 % - and this really pays off! Even today, our products are well below the toughest energy consumption thresholds that are set to become the future standards. Also, their design, development and production follow the principle of sustainability and make their eco-balance quite an impressive one. Numerous environmental awards testify to this. After all, we take great pride in our philosophy: Each new product has to be better than its predecessor in terms of ecology and economy. This distinguishes us from others. **www.ebmpapst.com**

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