



# AERZEN COM·PRESS

## Aerzen Asia

New head office in Singapore officially opened



## Pneumatic industry

AERZEN offers certified safety standards



## Biogas machines

Efficient thanks to AERZEN



Dear Readers,



Pierre Noack,  
Process Gas  
Division

With increasing specification effort, users, system manufacturers and consultants protect themselves against technical risks. The explosion protection, which is required for many applications, accelerates this development decisively.

The wide application range of AERZEN for air and process gas requires effective and professional work with specifications, local regulations and guidelines. Continuous risk minimisation and a short amortisation period are main criteria for the investment decision and placing an order with the preferred supplier. Maximum operational reliability and bespoke solution concepts for process integration are AERZEN answers to increasing demands on machinery.

The close support of the project well before concluding the contract enables AERZEN to clarify in advance questions about conformity and risk minimisation in the Front End Engineering.

In this edition of COM.PRESS, you will find out how AERZEN practises and expands explosion protection, how AERZEN with biogas machines optimise energy efficiency at a dairy plant in Denmark, and much more. Enjoy reading your journal!

Cordially yours,



In ATEX relevant application ranges such as the chemical industry technologies of AERZEN are the right choice.

## ATEX: Blower technology and explosion protection

AERZEN combines effective reactions with preventive measures

As specialist in blower and compressor technology for conveying air and gaseous media, the AERZEN Ex-protection within different ATEX-zones is a part of day-to-day business.

**C**ombustible dust, spatial distribution, oxygen share, ignition source and the closed reservoir are components of a dust explosion and form the so-called explosion pentagon.

### Combustible material

Dust-air mixtures are explosive when the dust consists of combustible material. This includes besides timber, flour and cellulose cocoa, coffee, starch and inorganic substances such as the elements magnesium, aluminium and iron. These raw materials are typical when pneumatic conveying systems are used for which blowers or compressors made by AERZEN ensure the continuous supply of the production by the silo.

### Closed reservoir

Pneumatic conveying uses a piping system for the material flow. Here, in the sense of the explosion pentagon this con-

cerns a closed reservoir, without which an explosion is not possible, and without which a pneumatically driven material flow would not work.

### Dust distribution

The process air generated by blowers or compressors conveys amongst other things fine dusts and powders through the piping system. Then, inside the piping, the conveying air is mixed with the product. The fine distribution increases the risk of a dust explosion as the combustible substance can ignite easily due to its large surface and the maximum availability of oxygen.

### Oxygen

If a substance burns, this conceals an oxidation. In case of a fire, this proceeds slowly, in case of an explosion abruptly. Both of them have in common that oxygen is needed to generate a fire as well

as an explosion. Therefore, explosives always carry their own oxidant. No matter whether timber or explosives: Both of them need activation energy fed in from the outside to be able to burn or explode.

### Ignition source

What a match is for timber and a lit fuse for explosives is for pneumatic conveying mechanical friction, electrostatic charges or hot sparks. Frequently, they are sufficient as activation energy to detonate a dust-air mixture.

### Influence of the blower technology on the explosion pentagon

Concerning pressure conveying of dust or combustible gases, the only way to intervene with the conception of the suitable blower or compressor technology is at the ignition source of the explosion pentagon. It must be excluded that an ignitable energy source is introduced into the conveying medium. Concerning assemblies with ATEX approval (2014/34/EU) AERZEN most effectively and elegantly integrated a spark arrester in the discharge side silencer. The highlight of this





Special moment: symbolically the ribbon for the inauguration of the Aerzen Asia site is cut.

## Aerzen Asia opens new head office in Singapore

On 25th August 2017, Aerzen Asia officially opened its new head office for the Asia Pacific (APAC) region in Singapore. Customers, partners, suppliers and colleagues of the region and from Germany participated in this event.

Klaus-Hasso Heller (CEO AERZEN), Chuck Lim (Vice President Aerzen Asia Pacific) and Stephan Brand (Vice President Marketing & Product Management) gave very inspiring and encouraging speeches about the importance of team spirit, co-operation, friendship and future orientation for the team in Asia. In his speech Chuck Lim emphasised that the term "team" stands for "Together everyone achieves more." So, each member of the team is an important piece of the puzzle.

Later on, during a ceremony, symbolically the ribbon for the inauguration of the site was cut and they had a glass of sparkling wine. A traditional lion dance, asking for happiness and prosperity followed. After lunch, they had a guided tour across the premises. On the first floor of the two-storied building of Aerzen Asia the offices are located. At the ground floor there is a workshop for the After Sales Service. Here the focus is on overhauling and repairing blower and compressor stages. The training centre for many technicians in the AERZEN service team in the APAC region is also located there. The special facilities and equipment are on the same level as at the parent company in Germany.

With its new head office Aerzen Asia is well prepared for the challenges of the expanding business environment.

For the opening of the new site of Aerzen Asia a traditional lion dance was performed. The guests could also visit the workshop.

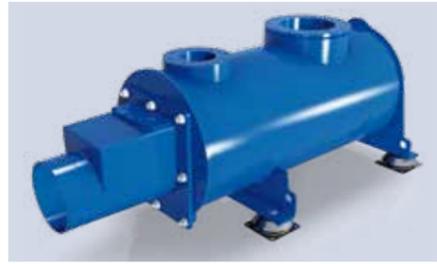


> solution is that the spark arrester works simultaneously as effective silencer. Compared with silencers with dampening material, concerning reactive silencers a slotted piping system eliminates the noise by means of a time-delayed interference of sound curves (interference method). This patented functional principle on the one hand works free from wear with regard to the otherwise eroding, loosening filter fabric and on the other hand ensures that sparks peter out and extinguish across the long way through the silencer.

### Cause for sparks

Potential risks in Ex-protection areas cannot be excluded even with a blower. If it comes to an input of sparks into the pressure pipe, as a rule, this results from a defect of the compressor stage. A too high bearing clearance, for example due to lack of maintenance, may be the reason why inside the rotary pistons do not rotate any longer with the defined air gap but hit together and generate sparks. In application ranges coming under the ATEX regulations, the spark arrester within the discharge silencers represents an effective measure to safely prevent the entry of activation energy into the material conveying flow. Thus, the silencer is among the reactive ATEX measures, as it is used when a damage has already occurred.

While the above measures aim to guarantee the Ex-protection, particularly for pressure pipes, AERZEN considers also for vacuum conveying the ATEX requirements as integral part of a blower solution from one single source. Concerning vacuum conveying the penetration of the material into the blower must be excluded safely. For this, mainly filter inserts are used, creat-



The spark arrester within the AERZEN discharge silencers represents an effective measure to safely prevent the entry of activation energy into the material conveying flow.

ing a barrier between the material to be transported and the assembly, in this case providing the negative pressure. Furthermore, AERZEN developed their own zone separation filters, representing as so-called sentinel filter a further decoupling between the upstream process and the assembly. "If it comes to a filter fracture we can react accordingly quickly and shut down the assembly, before an explosive atmosphere can generate inside the compressor stage," explains Fabian Pasimeni, product manager for blowers and rotary lobe compressors at AERZEN. If, however, as a result of a chain of unfortunate circumstances it comes to an explosion the effects on the environment can be reduced effectively by using special material for the construction of the compressor stage. Pasimeni: "If the ATEX requirements and the explosion risk are high, for the housing of the compressor stage we no longer use normal grey cast iron, but special spheroidal graphite cast iron."

Mainly in ATEX relevant application ranges AERZEN uses early warning systems to prevent serious and safety relevant damage from the start. Here, this concerns the active mechanisms of Condition Monitoring, with which potential damage can be detected reliably - mainly by means of vibrational monitoring. "We offer an expansion stage covering three levels," says Pasimeni.



The easiest way to monitor vibrations of a compressor stage are special measurement points installed near the bearing positions. With sensors as second expansion stage AERZEN takes a step towards continuous monitoring. The sensors installed at the sides of the compressor stage measure continuously and emit corresponding 4-20 mA signals which can be monitored and evaluated by the control system. If the AERZEN blower itself is installed in an ATEX zone, the sensors are supplied with a corresponding approval. "Meanwhile, our modular system of blower solutions is so nuanced that we are able to quote for different applications with varying ATEX requirements as standard," states Pasimeni. Based on this extensive know-how AERZEN developed the third stage of real-time monitoring. With up to four sensors per compressor stage "we can look precisely into the inside and find out the condition of the corresponding bearing," explains the product manager. This includes condition monitoring of internal rings, Pitting (local material damage) and touching of the rotor against the internal housing wall as a consequence of thermal deformations.

If the assemblies themselves are installed in an ATEX zone, AERZEN serves this application with motors of different rating and further components with ATEX approval. ○

### Certifications

## AERZEN relies on uniform quality standards globally

In order to standardise the quality level worldwide and to further increase this for our customers, AERZEN is working to create globally applicable quality standards, by implementing a company-wide integrated management system.

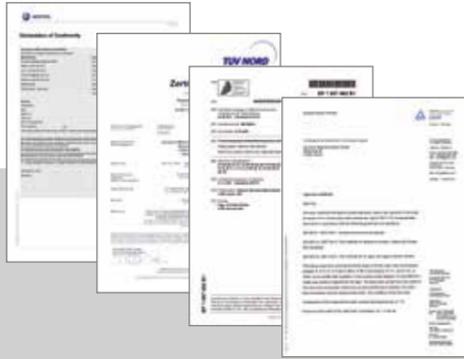
Numerous quality certificates attest to this: within the producing companies of AERZEN group, quality is a high priority. At the beginning of 2017, AERZEN Germany implemented an audited integrated management system with the components DIN EN ISO 9001 (quality management), 14001 (environmental management) and 50001 (energy management), as well as OHSAS 18001 (working and safety protection management). Moreover, the German subsidiaries Emmerthaler Apparatebau, as well as RKR Gebläse und Verdichter are ISO 9001-certified. This also applies to AERZEN in Belgium, Hungary, the U.S.A., China, India and Korea, indeed Belgium, the U.S.A. and China already have the most current certificates according to ISO 9001:2015. Furthermore, all companies have different special certi-

fications depending on their service portfolios, for example for pressure equipment and container construction, gas meters or explosion protection.

The head office at Aerzen is ultimately responsible for quality assurance across the group of companies worldwide. There, around 60 employees take care of the subject of quality, three of them focus entirely on certifications. They support the mostly two- or three-person quality teams in the other companies. The first "Global Quality Meeting" will take place in Aerzen on 25-26 October 2017 and all quality managers will be involved. One of the topics on the agenda will be the possible standardisation of the management systems of the company. "Our goal is constant quality in all its aspects. This can be reached with a globally certified integrated management

system which is usefully supplemented by special certifications depending on the local company", according to Olaf Tanner, Department Manager of Quality. His representative, Christoph Schmidt, stresses the important advantages of a global solution: "We will be able to serve the markets much better. Moreover, having such a system in place is very often a prerequisite in order to receive public and safety-relevant orders." And what means an integrated AERZEN management system for customers? Tanner's answer on this is clear: "Customers can always rely on AERZEN quality, no matter where in the world their purchases are made." ○





100% product purity and safety thanks to certified technology

A new brochure informs about the AERZEN safety standards for the pneumatic industry.

## PRODUCT CONTAMINATION? NOT WITH AERZEN!

The absolutely oil-free and absorption-free compressed-air technology from AERZEN guarantees you 100% product purity in all pneumatic conveying processes of sensitive bulk material. We save demanding production requirements, e.g. in the food industry, in the pharmaceutical industry, or in chemical and petrochemical processes thanks to innovative and ATEX-certified technology.

[www.aerzen.com](http://www.aerzen.com)

Product contamination? Not with AERZEN!

## AERZEN offers certified safety standards for the pneumatic industry

There are high demands on blower technology in pneumatic conveying of bulk material. AERZEN has therefore developed a new and certified safety standard.

These expectations are not only caused by the fact that these systems have a key function in the material flow, but are also based on the fact, that the quality of process air is of vital importance. The purity of the conveying air and the final product both influence the quality of pneumatic processes. For manufacturing high-quality products, e.g. in the food industry, pharmaceutical and cosmetics industry, in parts of the automotive industry, the paper and textile industry, but also in sensitive chemical or petrochemical processes, the purity, safety and reliability are decisive. In this context, AERZEN has developed a new and certified safety standard, especially for the requirements in the pneumatic industry.

First of all, the oil-free operation should be mentioned. Not only the contamination of bulk material with oil poses a potential hazard here, the contamination of the installed system may be a risk factor as well. AERZEN, being among the world's leading manufacturers of positive displacement blowers, rotary lobe compressors and screw compressors, has initiated an extensive certification according to ISO 8573

for all series together with TÜV Rheinland. On that basis, an oil-free operation of class 0 had been confirmed and certified for AERZEN blower and compressor packages.

### Completely new silencer technology

The AERZEN safety concept goes even further and therefore, the focus is also on the silencer technology. Discharge silencers which are lined with absorption material are still often used for blowers and compressors. However, this insulating material is subject to natural wear. This wear is caused primarily by the high intake temperature of the air and the abrasive wear by the pulsations in the silencer. The absorption material is washed out of the silencer in fine particles and so it gets into the conveying air.

As a consequence of this, AERZEN has developed an entirely new silencer technology, which has been successfully patented. The sound level of these reactive silencers is reduced purely by means of air deflection. The advantages are obvious: Process safety and air quality are guaranteed as well as a constant sound pressure level

across the entire life cycle, as no wearing material is used. Furthermore, the pressure losses in the silencer had considerably been reduced compared with conventional solutions. The result is increased energy efficiency!

### No external spark arresters necessary

Often overlooked in pneumatic conveying systems is that blowers and compressors may produce sparks in case of malfunction and that, fed into the conveying pipe (pressure conveying), these sparks can ignite dust-air mixtures. The patented silencers made by AERZEN also play an additional key role, as thanks to the internal air deflection, the reactive silencers also serve as spark arresters. An innovative solution, inspected and certified by the TÜV. When using AERZEN blower and compressor packages, external, on-site spark arresters are not needed anymore, offering a great advantage for plant manufacturers and plant operators as well. As besides the ATEX compliant safety, the AERZEN solution saves on investment costs and energy costs sustainably, as pressure losses caused by downstream spark arresters can be prevented.

Furthermore, AERZEN offers a solution portfolio for almost all ATEX zones which is unique for a wide range of applications and performances. The AERZEN packages Delta Blower, Delta Screw and Delta Hybrid are tailored specifically to meet the requirements of categories 2 and 3 for dust and gas zones in accordance with the European Machinery Directive 2014/34/EU. Explosion protection for systems in accordance with ATEX directive 137 (1999/9/29 EC) has also been taken into account.

The absolutely oil-free air technology, free of absorption material, made by AERZEN guarantees 100% product purity and 100% ATEX safety in pneumatic conveying of bulk material.

Typical risks in pneumatics:  
bulk material contaminated with oil during the pneumatic conveying process, ...



... deposit of insulating material from silencers with absorption material and ...



... burnt compressor system after sparking in the blower stage



### Applications with water vapour: new brochure

The know-how and experience that AERZEN has gathered over the decades in almost all types of application are particularly strongly reflected in water vapour and vapour recompression processes. The compression and transportation of water vapour is a complex process, which can only be achieved through the use of special technology and finely-tuned processes. In this context, water vapour is often used as a medium to provide heat in boiling, evaporation or distillation processes. This method can also be used during drying processes and for heat production in the chemical and foodstuff industries. The new brochure "Applications with water vapour" (A5-010-00) provides information about the AERZEN product portfolio in terms of water vapour compression, which includes a wide range of special blowers and compressors, combined with extensive application expertise. Please have a look at this new brochure.

You will find further information at:

[www.aerzen.com](http://www.aerzen.com)



### First Business-Event for Aerzen North Africa

Aerzen North Africa has moved into new premises: to mark the occasion, the subsidiary's first business event took place on 9th August 2017 in Cairo. 30 customers and plant manufacturers from the wastewater, cement, steel and chemical industries were invited to the Hotel InterContinental. After welcome speeches from Managing Director Dr.-Eng. Ahmed Yehia and Steffen Glindhaus (Director, Middle East & Africa), employees introduced the team, products, applications and the service orientation of Aerzen North Africa.

The establishment of Aerzen North Africa and the move into new premises mark an important step for the AERZEN Group, enabling the company to provide support for many customers and installations in North Africa through its own, local sales and service network.



Participants at Aerzen North Africa's first business event.

### Questions, Suggestions, Ideas?

We are looking forward to all your queries, comments and suggestions on our customer journal and we are at your disposal for further information on AERZEN products and services. Give us a visit on our website:

[www.aerzen.com/news](http://www.aerzen.com/news)

## Exhibition dates

(4<sup>th</sup> quarter 2017 – 1<sup>st</sup> half 2018)

<b>WEFTEC</b> , Chicago/U.S.A.	2 <sup>nd</sup> until 4 <sup>th</sup> October 2017
<b>Fenasan</b> , São Paulo/Brazil	3 <sup>rd</sup> until 5 <sup>th</sup> October 2017
<b>Easy Fair Solids</b> ,	
Rotterdam/Netherlands	4 <sup>th</sup> /5 <sup>th</sup> October 2017
<b>PCVExpo</b> , Moscow/Russia	24 <sup>th</sup> until 26 <sup>th</sup> October 2017
<b>KOMAF 2017</b> ,	
Kintex, Seoul/Korea	24 <sup>th</sup> until 27 <sup>th</sup> October 2017
<b>Aquarama-TNAV</b> , Leuven/Belgium	25 <sup>th</sup> October 2017
<b>Maintenance</b> , Dortmund/Germany	21 <sup>st</sup> /22 <sup>nd</sup> February 2018
<b>my job owl</b> , Bad Salzuflen/Germany	9 <sup>th</sup> until 11 <sup>th</sup> March 2018
<b>Aqua Nederland</b> ,	
Gorinchem/Netherlands	13 <sup>th</sup> until 15 <sup>th</sup> March 2018
<b>ANUGA FOOD TEC</b> ,	
Cologne/Germany	20 <sup>th</sup> until 23 <sup>rd</sup> March 2018
<b>Expo Apa 2018</b> , Bucharest/Romania	14 <sup>th</sup> until 16 <sup>th</sup> May 2018
<b>IFAT</b> , Munich/Germany	14 <sup>th</sup> until 18 <sup>th</sup> May 2018
<b>ACODAL</b> , Cartagena/Colombia	31 <sup>st</sup> May until 2 <sup>nd</sup> June 2018
<b>ACHEMA</b> , Frankfurt a.M./Germany	11 <sup>th</sup> until 15 <sup>th</sup> June 2018
<b>Mioje Int. Oil and Gas Exhibition</b> ,	
Moscow/Russia	18 <sup>th</sup> until 21 <sup>st</sup> June 2018



Alejandro Knoop (r.) with Adrian Dubini, first customer of Aerzen Argentina

## Order No. 1 for Aerzen Argentina

Adrian Dubini will always be remembered at Aerzen Argentina. The Managing Director of Dubini Automación placed the first order with the new AERZEN subsidiary, founded on 1st May 2017. In appreciation, Alejandro Knoop, Director Aerzen Argentina, invited his first customer to join him for a photo. Mr. Dubini ordered a positive displacement blower Delta Blower GM 15 L. This assembly, from AERZEN series Delta Blower Generation 5, will be used for pneumatic conveying at a manufacturer of pet food and veterinary products.

## IMPRINT

### AERZEN COM-PRESS

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# AERZEN



Maintaining a constant pressure over a long distance: Wolfgang Ohlau (AERZEN) and Olav Hald (Herning Bioenergi, right) emphasise the importance of blower technology.



A combination of AERZEN positive displacement blowers, type Delta Blower, takes care of the gas supply at Arla production site. The blower stages are consistently the same in terms of the standardisation.

Herning Bioenergi and Bigadan use blower technology made by AERZEN

## Above all, biogas must be efficient

In Denmark, AERZEN blowers create the link between biogas plant and dairy plant.

Until 2020 Denmark wants to reduce its gross energy consumption - regardless of the aspired economic growth - by 12% compared with 2006. Another goal: Until 2050 the own power and heat requirements shall exclusively be served by renewable energies, thus, becoming independent from fossil fuels in the long run. The kingdom is right out in front in Europe, with more than 80 biogas plants. In Germany, they are still discussing about "using up" the cultivated silage, whereas, in Denmark the bacteria satisfy their hunger with manure from pigs and cattle. Slaughterhouse waste and fish waste, transported by ships from Norway, is being fermented after pasteurisation in a just recently expanded plant at Herning.

650 tons of manure is conveyed daily into four fermentation towers at Herning Bioenergi A/S. These towers with volumes of 2 x 3,500 m<sup>3</sup> and 2 x 8,000 m<sup>3</sup> produce biogas. The gas consists of 70% methane, the residual is carbon dioxide. Unlike many German biogas plants, in Herning there is no power generation by block-type thermal power stations. The biogas is not separately purified to be fed into the gas grid. Rather, Herning Bioenergi has two big direct customers who belong to Arla Foods, one global, cooperative-owned dairy company counting more than 13,500 dairy farmers from Sweden, Denmark, Germany, Great Britain, Belgium, Luxembourg and the Netherlands.

The biogas plant in Herning is connected with the first plant in Naviro via a 21 km long gas piping. From there, another 6 km-piping leads to the production site in Videbæk. Three block-type thermal power stations burn biogas on these two production sites. The electricity generated is used for the base load supply on site just like the heat. All three block-type thermal power stations reach a rating of approx. 3 megawatts with their combined heat and power generation (CHB). The demand of the two milk processing establishments is much higher. "As the base load is high and we have only a small part in it, we can be sure that the biogas is really needed," explains Olav Hald, Production Manager of the biogas plants in Herning. This delivery certainty forms the basis for a continuous operation with optimum biological processes. "The produced biogas is primarily used up and fossil fuels, such as natural gas, can be procured on production basis,"

says Edvin Andersen, Technical Manager of Messrs. Bigadan & Herning Bioenergi.

### The AERZEN blowers generate up to 1,000 mbar overpressure

The biogas from Herning is conveyed by blowers made by AERZEN. In order to convey for the current application, three Delta Blowers, type GM35 S (maximum data, each 1,900 m<sup>3</sup>/h at 1,000 mbar with 90 kW drive), are needed with a medium differential pressure. "With the installed piping diameter, the biogas conveying can even be increased in future if needed. This would mean a pressure increase of up to 1,000 mbar," explains Jörg Brockmann, Project Manager Bigadan Deutschland. The AERZEN Delta Blowers are designed for these pressure ranges. "In Herning we have to withstand a higher pressure, so that the biogas reaches at the end of the piping the gas storage facilities of the block-type thermal power stations with the required minimum overpressure. If the overpressure is too low, the block-type thermal power stations switch off."

The twelve assemblies made by AERZEN are divided in four groups of three. The first trio conveys the biogas, produced in Herning, from an interim storage facility into the piping. At the first station, the second trio takes over the supply of the block-type thermal power stations. A third stage acts as pressure increasing station for the further transport of the remaining gas to Arinco, final destination. Three AERZEN Delta Blowers are installed in a machine housing and provide the two block-type thermal power stations with the appropriate pressure.

Due to the optimum provision of spare parts, Herning Bioenergi and plant manufacturer Bigadan use Delta Blowers GM35 S, despite different gas volume flows and differential pressures, for all three locations. The assemblies have been adapted to the rating required thanks to corresponding motor designs and accessories. The base configuration is identical. Thus, the local Danish biogas network does not need to be served with complete stand-by assemblies, but rather with a few stand-by stages. "These stand-by stages can be combined with all motor types. We take care of the maximum availability, without investing too much money into stand-by machines," explains Wolfgang Ohlau, Sales Engineer AERZEN Deutschland.

The demands on the availability are high. Depending on the process, the biogas plant produces around the clock. The interim storage facilities have only a limited volume. Apart from the fact that biological processes can hardly be stopped, it would mean the breakdown of the gas conveyance in the Arla factories and consequently loss of earnings for the biogas company. Herning Bioenergi relies on this income, as in Denmark exists no law which can be compared with the German Renewable Energies Act (EEG). "It is mandatory for us as plant operator to act economically," emphasises Edvin Andersen.

AERZEN ensures a high availability with long service life, as the Delta Blowers are ATEX approved and adapted to the conveyance of biogas. "The blower in biogas design consists of a housing made of special nodular iron, a ChemCoat conveying chamber coating and particularly coated rotors," explains Wolfgang Ohlau. Prior to transport the biogas is cooled and drained in Herning. However, the biogas still contains small amounts of residual moisture and hydrogen sulphide. In case of longer standstills, the residual moisture condenses, leading to permanent damage of the blower when a special coating is not provided. "Humidity and hydrogen sulphide as acid producers is a difficult subject in this matter, but, thanks to AERZEN solution no longer a problem," summarises Ohlau.

This is why blower technology made by AERZEN is applied in Denmark. In addition, the Delta Blowers fit perfectly for the application thanks to their performance capability. "What we need is a differential pressure of one bar. We have not found a supplier besides AERZEN who can do this with a single stage. Less pressure is not sufficient for us and a multi-stage design is bad for the energy efficiency. Looking at our plants, running 24 hours a day for 365 days a year, it is essential that the blowers run efficiently," emphasises Edvin Andersen. ○

Edvin Andersen (left) and Jörg Brockmann have designed the gas supply system together with AERZEN. A performance expansion is being planned.

