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Dear Readers,



Klaus Grote,
Vice President
EMEA AERZEN

The first trade fairs of the year are over, and our visitor numbers, especially in the wastewater sector, confirm that AERZEN solutions are well tailored to the application requirements and that continuous development and optimisation will be rewarded. Efficient solutions are becoming more and more popular, and not only in Europe.

In addition to contents from the wastewater sector, this edition also contains information on another important application - pneumatic conveying. Here, well-known customers have relied on AERZEN equipment for decades.

With the establishment of new locations, we are constantly opening up new regions worldwide in order to ensure the best possible presence in sales and service and to be at our customers' side as a partner at all times.

And now, please enjoy reading further details in this edition of COM.PRESS.

Sincerely yours,



The fibreboard production at Knauf in Rottleberode is supplied with stucco from the gypsum plant via a specially built pipe(line) bridge.

Delta Screw units of type VM21 supply a volume flow up to 1200 cubicmetres per hour.

The gypsum blown through the pipe

Pneumatic conveying: Knauf and ISS rely on screw compressors made by AERZEN

At the Knauf site Rottleberode AERZEN screw compressors type Delta Screw are used for the pneumatic transport.

Knauf has recently invested around €33 million in the Rottleberode site in the southern Harz region - and in 2017 a modern fibreboard plant was taken into operation. Cellulose and stucco are the main components of the boards, which are very versatile in interior design applications. A pipe system is used to transport the fired and finely ground natural stone between the gypsum and fibreboard plants. AERZEN screw compressors type Delta Screw provide the appropriate pressure and volume flow during pneumatic transport.

The energy revolution will make the gypsum industry increasingly dependent on natural stone deposits in the future. The entire industry is in a state of upheaval, because the FGD gypsum produced in the desulphurisation plants of lignite-fired power plants is a dying breed due to the shutdown of these power plants. On the other hand, the possible applications of gypsum are becoming more and more

diversified for example: fire-retardant or water-repellent gypsum plasterboard, plaster, flowing screed and gypsum fibre board are just some of the applications in the construction industry. No industry can do without gypsum anymore. This makes it all the more important for leading manufacturers, such as Knauf, to use limited raw materials sparingly.

The hunger for gypsum

At the Rottleberode plant, for example, Knauf returns the edge breaks which occur during the production of gypsum fibreboard to the material flow in the same way as the dust during surface grinding. "Every crumb of gypsum is important for us. This is why raw materials should no longer be disposed of during production," emphasises plant manager André Materlik. His company is the only one within the Knauf Group which exclusively processes natural gypsum from the quarries in the southern Harz region. In view of the

move away from lignite mining, industry experts argue that only those companies which develop and secure mining areas in the long term will continue to exist - and demand for gypsum in Germany alone is already high at around ten million tonnes per year. According to Materlik, around 450,000 tons of finished product leaves the Rottleberode plant every year, with around 100 truckloads a day.

Stucco plaster, fine cellulose from waste paper and water: this is the mixture from which gypsum fibreboards are made. ISS Schüttguttechnik GmbH from Wilnsdorf in the Siegerland region plans and builds blow moulding machines to supply the mixers. ISS had already done a good job at Knauf before the new fibreboard plant was built, and had successfully got to grips with the problems involved in conveying and metering pulverised lignite. The fuel develops the necessary heat for calcining the rough stones. In the process, the natural gypsum loses a large part of its crystallised water content. "For uniform thermal processes, the constant transport of lignite without pressure or volume fluctuations is es-



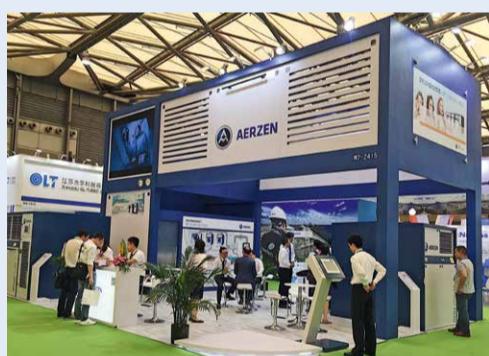


A computer graphic of the new location of Aerzen USA in Atlanta, which mainly serves customers based in the southeast of the United States.

Aerzen USA continues to grow: new office in Atlanta

Following the expansions of the headquarters in Coatesville/Pennsylvania and the opening of a new sales office in Houston/Texas in 2017, Aerzen USA has now opened up in the southeast of the United States: in May 2018, the AERZEN subsidiary inaugurated a new location in Atlanta/Georgia. The new building covers almost 2,000 square metres of production and storage space, as well as an area of 260 square metres for offices. "We are pleased that we are now closer to our customers in the southeast of the USA," emphasises Tony Morris, Managing Director, Aerzen USA. "The new facilities will allow us to serve important markets more flexibly and efficiently," he adds.

The space in Atlanta is available for rental machines, spare parts warehouses, assembly, repair and maintenance of assemblies, as well as state-of-the-art test procedures. The new offices are used primarily for sales, and there is space available to accommodate more employees in the future. The site is expected to be fully operational in the autumn of 2018.



Performance³ was the focus of the IE Expo booth of Aerzen China.

AERZEN China at the IE Expo 2018

Aerzen China had a strong presence at the IE Expo 2018, held in Shanghai from 3-5 May, which attracted more than 60,000 visitors from over 60 countries. At Asia's leading trade fair for environmental technology, the company presented itself with the motto: Performance³ - The Next Generation.

At the AERZEN booth, prospective customers could gather information about Aerzen Turbo AT300-0.8, Delta Hybrid D62S, D17L and AERsmart by means of sectional models. The team welcomed not only visitors from China, but also customers from Singapore, Malaysia and Thailand. Chuck Lim, Vice President Aerzen Asia Pacific, also participated in the IE Expo. First Environmental Protection Net conducted an interview with Sam Hoo, General Manager Aerzen China, on 3 May about the innovative AERZEN technology, and this was transmitted online.

The conclusion: the three trade fair days were very positive for AERZEN's brand awareness and have confirmed the position of the company as a leader in the environmental market. Aerzen China is already looking forward to IE Expo 2019.

"> sential," explains the plant manager. Any deviation from the ideal line is noticeable and can affect the product quality of the stucco, the deposits in the calcining mill, the CO values in the exhaust gas flow or the energy consumption of the screw compressors. "Uniform processes require less air," says ISS Sales Managing Director Robert Partzsch, who speaks from experience.

Process-safe with high efficiency

For this reason, ISS has also put all of its know-how into the development of an overall solution for the conveying of stucco plaster, which was developed in Rottberode together with the plant planners of Knauf Engineering GmbH. The company, under the Knauf umbrella, planned the entire new building at Iphofen and also ordered the conveyor technology. The main focus was on process safety, longevity and energy efficiency. „The high efficiency is due to the AERZEN screw compressors," says Partzsch. In addition, the Delta Screw series is recommended because of its pressure range, which is ideally suited for the transport of stucco.

It is important to know that according to the experience of the ISS Managing Director in the pneumatic conveying of bulk materials, compressed air with 5 to 6 bar is often first generated in order to feed an air vessel. This makes available an often significantly lower delivery pressure. "Intermediate buffering always results in energy losses," emphasises Thomas Koch, head of technical mechanics at the Knauf plant in southern Harz. The Joule-Thomson effect is proof of this. Every 100 millibar increase in pressure causes a temperature rise in the compressed air of +10 degrees centigrade, due to the increased friction of the molecules. The effects of this physical connection can be limited if air vessels are dispensed with - as is the case at Knauf. However, since thermal energy cannot be

ISS Schüttguttechnik has planned and realised the new stucco supply together with Knauf Engineering.



completely prevented during pneumatic conveying, Knauf uses it in winter with recovery for heating purposes.

Never wasting any energy

In view of the fact that it is always better not to use electricity in the first place, rather than returning it later as heat, the goal must be to use compressors in energy-intensive compressed air that deliver the required volume flow with exactly the required pressure without intermediate storage. "AERZEN is simply the leader in the range from 2 to 3.5 bar," notes Partzsch and adds: „why should I generate 6 bars when I only need 3 bars?"

The Delta Screw units type VM21 with a motor rating of 90 kW supply a volume flow of 1,200 cubic metres per hour. The maximum pressure is 3.5 bar. The Generation 5 machines of the Delta Screw series installed at Knauf are designed by AERZEN as universal machines - with great attention to efficiency. Developed as a flexible modular system, the different compressor units can be suitably configured with motors of varying performance and an extensive range of accessories. Belt drive adjustment options, for example, provide the basis for accurately adjusting the vol-

ume flow even at fixed speeds - with the aim of preventing energy-intensive excess generation. This claim is backed up by the renunciation of redundancy at Knauf. Compressors and conveying systems work so reliably that separate „backup technology" can be dispensed with. "The plant is designed for a capacity of twelve tons of gypsum per hour," says Koch. If one assembly is taken off the grid, a temporarily switched bypass solution ensures reliability of supply. "However, our installation generally provides that one compressor always serves one system," he adds.

Result

In the course of building Knauf's new fibreboard factory in the southern Harz, the newly installed blow moulding systems for pneumatic conveyance of stucco highlight some of the most important elements for minimising the consumption of costly energy - the focus was on increased efficiency and optimal design at the point of operation. Knauf has a clear system concept with the equipment at its works. "It is the combination of scientific and technical knowledge which makes up the solution of ISS. Here, everything is as it should be," says plant manager Materlik.

Reference project

Helium recovery in natural gas conveying

AERZEN has supplied an EAC-certified unit for Helium-compression according to API Standards for a large natural gas processing project in Russia.



Example of an oil-flooded VMY screw compressor

The unit, operating with three oil-flooded VMY-screw compressors in two pressure stages, is divided into three compressor skids and two separate oil supply units. The total installation area is around 200 square meters and the total weight is approximately 140 tons. The hardware of the integrated package unit control consists of two control cabinets, each with HMI-interface and two operating panels. AERZEN was also responsible for the programming and fabrication. With a so-called "2oo3" logic for process assurance, redundant CPU and connection to the customer system, the SIL certified control ensures maximum safety standards.

Wastewater technology

Efficiency gains through modelling

It is the activation process which accounts for the lion's share of the electricity used in the treatment of wastewater. In energy studies, it is worth taking a closer look at the processes, especially in this case.

Armín Meister, and his engineering office, rely on dynamic modelling methods from system theory for the analysis and optimisation of existing systems in wastewater treatment plants. With this structured approach, the physics engineer at the wastewater treatment plant in Bingen has succeeded in significantly reducing the energy requirement through conceptual changes, and the use of modern hybrid blowers from AERZEN. At the same time, the plant's elimination performance has increased dramatically.

The biggest leverage is process improvement

Pushing processes and the environment forward through modelling: for the wastewater treatment plant in Bingen, which has been designed to cater for a population equivalent of 80,000, this far-reaching approach has led to a considerable improvement and stabilisation of the cleaning performance. The energy savings in the area of activating sludge are divided between conceptual improvements, and the use of better machine technology. "Besides staff costs and maintenance costs, energy costs and discharge values also determine our operating costs," says Meister. Lower discharge values mean a reduction in the wastewater levies which have to be paid to the national government. Investments therefore pay off twice.

The optimised processes require careful technical design, so that systems can be run as continuously as possible at the optimal load point with the aid of a fast and dense network of sensors. Meister investigated load curves spanning several years, and based on this he designed the modelling. The modelling forms the basis for defining future requirements for the compressor stations. "This made it possible to select the most suitable assembly in terms of energy consumption and overall cost-effectiveness, while ensuring the appropriate technical requirements for wastewater treatment and the necessary redundancy." This led to the selection of AERZEN rotary lobe compressor, type Delta Hybrid. Here, two air conveying processes are combined in one machine: Root's principle as full pressure compression for low pressure, and the screw compressor principle with internal compression for higher pressure. Calculations show that the rotary lobe compressor requires up to 15 percent less power than conventional compressors for absolutely oil-free air conveying.

Operation at optimal load point

Four Delta Hybrid machines are required, which cover almost 90 percent of all op-

erating cases, so that the older and less energy-efficient assemblies are only used for rare high-load or redundancy events. In view of the optimal load points, the rotary lobe compressors with graduated capacities and correspondingly adapted motor sizes are used for two independent compressed air systems.

The largest Delta Hybrid rotary lobe compressor, type D62S, with 110 kW motor rating and 1,000 mbar maximum differential pressure, supplies up to 3,500 cubic metres per hour. The D36S, D24S and D12S models are smaller dimensioned and deliver 2,150, 1,390 and 690 cubic metres per hour with motor ratings of 75, 55 and 30 kW respectively. The two smaller assemblies are installed in the engine house, which also houses the older machinery. The two large Delta Hybrid machines are located outdoors. A simple roof protects them from the weather.

Robust design for outdoor use

The decision to install the two Delta Hybrid, types D62S and D36S, outdoors, was made for two reasons: not enough available space and inadequate ventilation in the engine house. The Joule-Thomson effect, which occurs during air compression, means that the compressed gas mixture heats up, as the molecules move closer together due to the higher pressure. An increase of 100 millibars results in a temperature delta of +10 degrees centigrade. This increases the required compression effort due to reduced air density and lower oxygen content of the intake air. Installed outdoors, the Delta Hybrid machines can dissipate heat losses much more effectively into the environment and in turn suck in air that is not thermally preloaded.

This correlation has the same effect on energy efficiency as the use of technology tailored to performance. One aspect to consider at this point: the operation of the rotary lobe compressors with a frequency inverter for demand-oriented and thus economical speed control of the drive motor. The four sizes of the Delta Hybrid with their scaled motor rating also make it possible to operate the load points most frequently occurring with optimal efficiency. In addition, the high adjustment range of the Delta Hybrid machines ensures that there are large areas of overlap between the assemblies. These areas are necessary, in order to ensure optimal adjustment of all operating points and stable compliance with the control specifications, even in case of continuous load changes of the system. This is particularly important as the activator basins of the Bingen wastewater treatment plant are not divided into fixed zones for ammonium degradation and nitrification. Rather, the areas of the different biodegradation processes can be variably adapted to the contamination loads by connecting the basin zones and the precise air control of the surface ventilators mounted on the basin floor.



Two Delta Hybrid machines are placed under a protective roof outside the wastewater treatment plant.



The blower technology can be operated on site via a touch panel.



New meets old: the old-fashioned blowers now serve as redundancy and standby for peak loads.

The areas into which air can be brought, and in what quantity, can be adjusted as required by means of control valves. There is a sliding pressure control system, so that valves, that are closed too far, do not cause the back pressure in the supply pipe to rise. This is based on the optimal interaction of volume flow, flap position and pressure. "Throttles, which are closed too far simply waste energy. 100 millibar more pressure means 20 percent more energy consumption," the planner explains. "When it comes to improving the quality of a plant, precise, stable control methods, which are tuned to the speed of the coupled processes, are indispensable," he adds.

In Bingen, a multi-stage control process operates in the background with pressure control as the leading variable for the compressor adjustment, and with a delay time of about half a minute. The control of the oxygen concentration in activation zones with settling times of about 10 to 15 minutes, which act on the control valves in the compressed air supply, is time decoupled from this. Their position ensures continuous adjustment of the system pressure and thus triggers the above mentioned sliding pressure control.



Based on the number of machines, volume flow and differential pressure, the calculator determines the initial savings potential.

Determining savings potential online

With a right-sized machine configuration based on highly developed AERZEN technologies, the company offers maximum savings potential for all plant operators in waste water treatment. AERZEN customers can now easily test how efficient the aeration in their blower station really is with the performance calculator on the AERZEN website. All you have to do is enter your current number of machines, the volume flow and the differential pressure, and you will immediately receive an initial result as to the level of potential savings that can be achieved. You will also be shown what your individual machine configuration would look like with the technologies in question in order to achieve the savings potential. Since each plant has individual requirements, AERZEN provides the customers with a tailored design based on the AERZEN Performance³ product portfolio - consisting of positive displacement blowers, turbo blowers and rotary lobe compressors.

The link to the efficiency calculator:
<https://www.aerzen.com/performance-calculator>



The guests from IBAR in front of AERZEN's head office. On the right is Martin Barger, Managing Director of AERZEN Austria.

Visit from IBAR to AERZEN

On 19th April 2018, a delegation from IBAR, the Upper Austrian sewage works association visited AERZEN. The guests were duly informed about the product range and visited the company offices. The visit to AERZEN took place following a suggestion from the Managing Director of AERZEN Austria, Martin Barger, who had made a special presentation at an IBAR meeting last winter. Martin Barger was also present at the head office in AERZEN, in order to welcome our guests, together with Markus Leidinger, applications specialist in wastewater technology. At the start of their visit, Barger presented the history and product range of AERZEN to the sewage works operators. After this, Leidinger engaged with a compelling presentation about the application and combination possibilities of the different blower types. A factory tour was the next item on the programme. Product manager Ricardo Wehrlein and sales engineer Thomas Kuhn led the guests in groups through the company and presented each individual processing step for the blowers. Josef Ortner, Chairman of IBAR, thanked Barger and the management of AERZEN.

Remko Knol, the new CEO of Aerzen Nederland



Remko Knol

On July 1st 2018, Remko Knol became the new Chief Executive Officer (CEO) of Aerzen Nederland B.V., based in Duijven near Arnhem. He is thus responsible for the business operations and strategy in the Netherlands.

"We are very pleased that Remko Knol has joined our management team. He has a lot of process know-how and knows a lot about the development of production processes, as well as the application of AERZEN solutions," says Siert Wiersema, Deputy Managing Director Aerzen Nederland.

Knol, who studied mechanical engineering and holds a master's degree in general management, can look back on 15 years of experience as a sales manager and managing director in the international technology environment. He has worked for Siemens Power Generation and Siemens Water Technologies, among others. For the past six years, Knol had served as Managing Director of Frames Separation Technologies B.V., Netherlands. The company designs and supplies process plants for the separation of oil, gas and water, as well as the treatment of production water.

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

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AERZEN

Performance³ – three blower technologies, one goal: highest efficiency



All AERwater modules prove themselves in any configuration, but also of course with their individual performance

AERZEN prepares for Water 4.0

AERwater: Knowledge of the exact load profiles

With AERwater, AERZEN brings together analysis, engineering, equipment technology, financing and service into one integrated system.

With AERwater, AERZEN has developed performance modules that bring the principles of Industry 4.0 to wastewater technology. They form the basis for future Water 4.0 solutions.

The energy requirements of wastewater treatment plants are interdependent in many ways. These include the special features of the cleaning procedures used, the overriding cleaning target, various local marginal conditions and the efficiency of the applied technology. The longest lever can be applied to aeration - specifically to ventilation technology. The supply of microorganisms with sufficient oxygen for ammonium degradation requires powerful blower technology, which requires around 80 percent of the energy required for aeration - and more than 50 percent of the total energy required by a wastewater treatment plant.

With AERwater, AERZEN starts precisely in this energy-intensive process area, since the savings potential through digitised, intelligent overall optimisations can be

appropriately high. Assembled from precisely combined modules, AERwater covers the entire process air cycle from planning through to service.

The service module AERaudit starts with a measurement of the volume flows prevailing on site and the subsequent calculation of actual load profiles. AERZEN's service team, equipped with sensor technology, energy meters and data loggers, analyses the operating data in real time and obtains clarity during evaluation as to where low and peak loads lie and what potential savings rest untapped in the blower station.

The aim is to determine the compressed air requirement as precisely as possible so that the Performance³ calculation can then be carried out. Behind this is the tailor-made machine and technology design including the RoI (Return on Investment) calculations necessary for investment decisions.

Performance³ - The next generation

With Performance³ AERZEN achieves a new level of efficiency - in the form of the

three high-performance technologies turbo blowers, positive displacement blowers and rotary lobe compressors. These technologies enable us to make the best possible selection in terms of energy efficiency for every application. The results of AERaudit form the basis for using the most suitable active principles or for freely combining them. Extended by the AERsmart machine control system different machine combinations can be continuously operated very close to the ideal operating point - which ultimately leads to extremely economical use of electrical energy.

However, optimisations are also available outside of pure machine technology. AERwater's machine room optimisation includes AERZEN's expertise in the planning of room ventilation and sound concepts as well as solutions for heat recovery. With a view towards the operating phase, AERwater also includes the realisation, i.e. the support of waste water companies in the dismantling of old plants, the commissioning of the new technology and the securing of operations during the construction phase with rental machines. Numerous services up to process monitoring round off the service package.

AERZEN Service network

Perfectly connected throughout Germany

Perfect machine availability also has to do with short distances. Therefore AERZEN is continuously expanding its service network.

The new service centres in Mönchengladbach, Essen and Trier recently started their work in order to be on site quickly and provide competent help. AERZEN invests specifically in a dense service network, with bases strategically distributed over the country, in order to be able to help the customers in the best possible way with fast reaction times and short distances. Furthermore, the costs of service calls are reduced due to considerably lower travel costs. More than 35 highly qualified and certified specialists are available in Germany alone. These service technicians are specially trained on AERZEN standard air blower packages. AERZEN Service from the headquarters in Aerzen is still responsible for all other machines.

