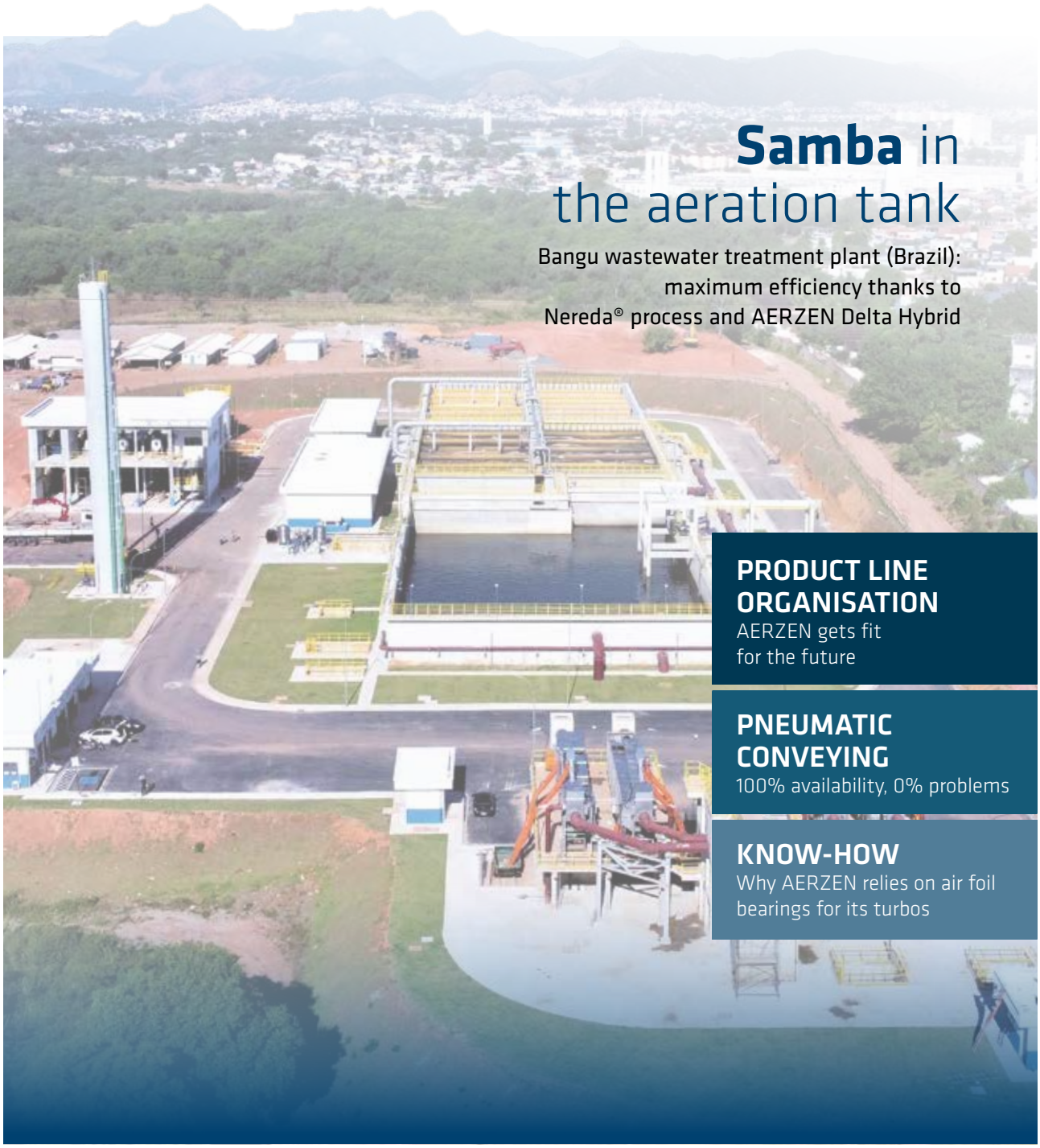
COM·PRESS



Samba in the aeration tank

Bangu wastewater treatment plant (Brazil): maximum efficiency thanks to Nereda® process and AERZEN Delta Hybrid

Customer Journal | No. 1.2023

AERZEN
EXPECT PERFORMANCE

Stephan Brand

Dear Readers

We are pleased to present you today with the first issue 2023 of our customer journal ComPress in its new design. We have fundamentally changed not only the format but also the layout to make it more reader-friendly and attractive for you. But as we all know, it's not what's on the outside that counts, but what's on the inside! And so we have also revised the content and added new subject headings for you.

In the future, for example, we want to report more on international references and applications. This is how the cover story "Samba in the aeration tank" was created with innovative solutions for wastewater technology in Brazil. We would also like to provide more information about changes in the AERZEN Group and organisation so that you always know your regional contact and can benefit from the international AERZEN network. In this context, we are also contributing to the new organisational structure at the head office, in which we are setting ourselves up according to product lines in order to be able to respond even better to your needs and requirements in the future.

Another new feature is the "AERZEN know-how" section, in which we not only inform you about new products, but also want to give you a deeper insight into our technologies. In this issue, for example, you will find exciting articles on AERZEN air foil bearing technology and hydrogen solutions.

But I am sure that this issue has many more exciting small and large articles in store for you. But have a look for yourself!

With this in mind, I wish you lots of fun and inspiration while reading our ComPress and hope that the new exterior and interior values will convince you!

Yours,

Stephan Brand

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Efficiency meets compactness: AERZEN has subjected its successful refrigeration compressors of the VMY series to a comprehensive upgrade and brought them technically up to date.

Craig Russell,
Managing Director
Aerzen Arabia

New **AERZEN** subsidiary in Saudi Arabia

AERZEN Group has established a new company based in Jubail, Saudi Arabia: Aerzen Arabia. The new entity will contribute to the expansion of Rental and Service business and offer a comprehensive product range including blowers and compressors.

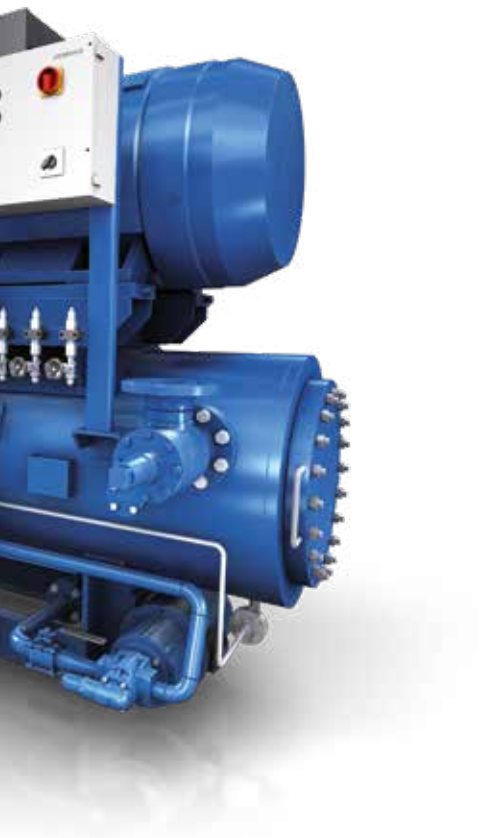
AERZEN is a market leader in the wastewater segment in the Middle East. The brand has been present in Saudi Arabia for decades and is known as a leading application specialist for the conveying and compression of gases with energy-efficient and resource-saving products and production processes. While the market had previously been served by Aerzen Gulf, based in the United Arab Emirates, the pandemic, and the restrictions associated with it, have provided an impetus to establish a physical presence in Saudi Arabia.

Managing Director Craig Russell and Operations Manager Jaleel Ansari will lead the team in Jubail.

Luis Miguel Jiménez,
Head of Turbo LATAM

New Head of Business Unit Turbo for Latin America

AERZEN continues to expand its turbo blower business in Central and South America. This is evidenced by the creation of the new position Head of Businees Unit Turbo LATAM, which Luis Miguel Jiménez has taken over. The engineer has ten years of experience in sales at Aerzen México, having previously worked in the industrial sector for two decades. “My responsibilities include coordinating technical and commercial support and aligning our product solutions and services with customer needs and expectations in Latin America,” explains Jiménez, who will lead Turbo LATAM as a separate business unit within Aerzen México, based in Metepec in the Toluca metropolitan region. “Over the course of this year, we will also be setting up local production at this location and this will involve several steps,” emphasises Stephan Brand, Director Turbo Business.



New **AERZEN** VMY screw compressors: refrigeration packages of the next generation

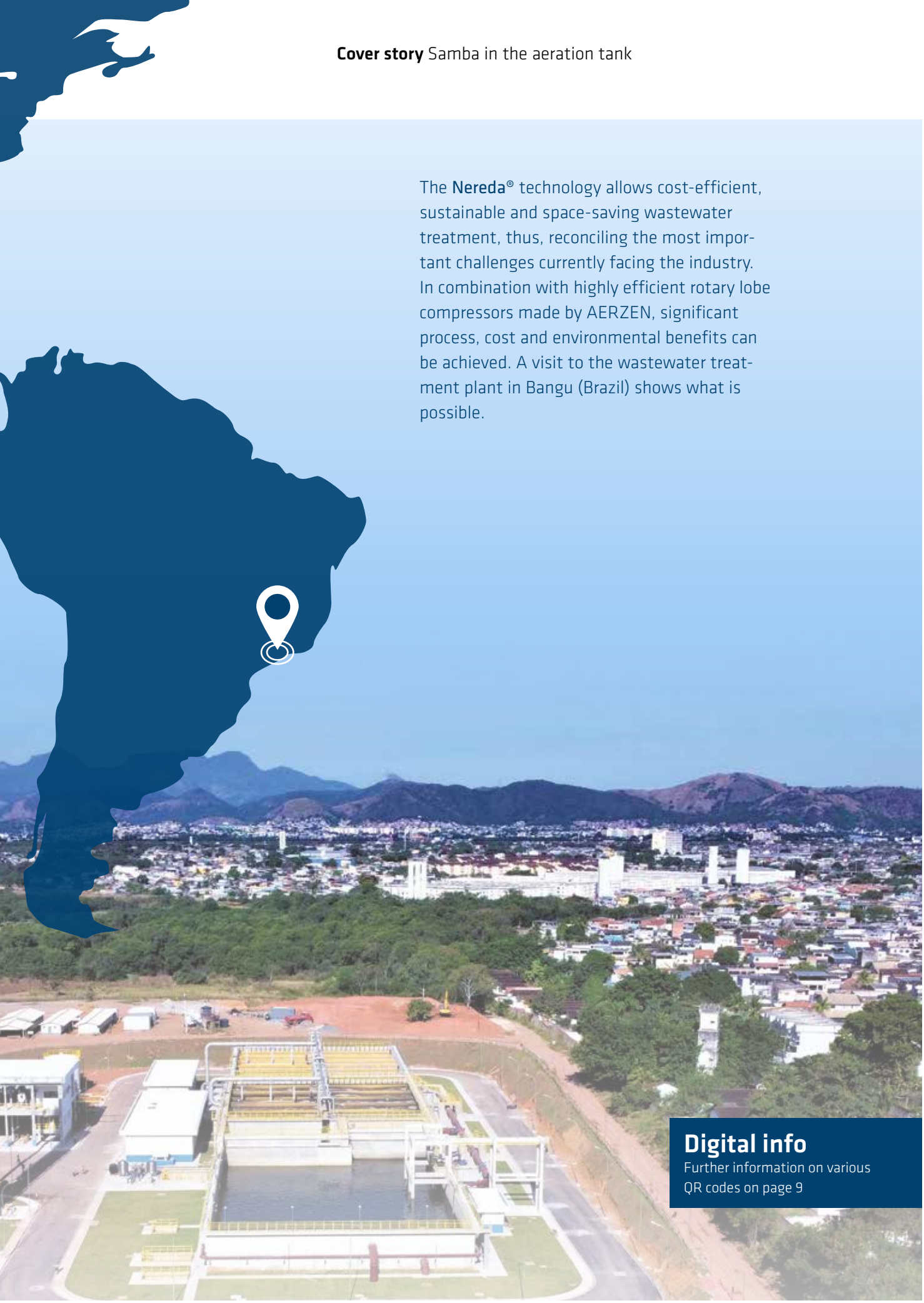
The requirements in the field of refrigeration technology are also continuously increasing. The new refrigeration compressors of the AERZEN VMY series with oil injection and built-in volume control especially are characterised by high energy efficiency, good controllability, and a particularly compact design, with which AERZEN meets the increased demand for space-saving, lightweight and low-maintenance packages - an ideal solution for the most demanding applications.

The latest screw compressors of VMY series are used in closed cooling circuits and are designed for intake volume flows of approximately 300 to 2,700 m^3/h and pressure differences of up to 25 bar. With their integrated volume flow control (slide valve or speed control), they enable a power adjustment between 20 and 100 percent. This makes the compression of gases, hydrocarbons, ammonia, helium, and carbon dioxide particularly economical. If a so-called economizer is used, the efficiency of the cooling system can be additionally increased and the operating costs further reduced. Only environmentally friendly refrigerants with a low GWP value (Global Warming Potential), such as ammonia, propane and propylene are used. Oil injection makes the compressors insensitive to fluctuating volumes, temperatures and pressures. Integrated oil separation systems reduce the residual oil content to 1 to 5 mg/m^3.

Samba in the aeration tank

Bangu wastewater treatment plant (Brazil): maximum efficiency thanks to Nereda® process and **AERZEN** Delta Hybrid

The **Nereda®** technology allows cost-efficient, sustainable and space-saving wastewater treatment, thus, reconciling the most important challenges currently facing the industry. In combination with highly efficient rotary lobe compressors made by AERZEN, significant process, cost and environmental benefits can be achieved. A visit to the wastewater treatment plant in Bangu (Brazil) shows what is possible.



Digital info

Further information on various QR codes on page 9

About 245,000 people have their home here in Bangu, a district in the west of Rio de Janeiro, and since May 2022, they have been connected to a central wastewater treatment plant. 43 million litres of wastewater are purified there - all thanks to Nereda® technology and rotary lobe compressors from AERZEN particularly efficient, resource-saving, space-saving and economical.

Nereda® offers economical and ecological advantages

Nereda® is an innovative, patented process for biological wastewater treatment, which was developed in the Netherlands at the Delft University of Technology in cooperation with the Royal HaskoningDHV Engineering Office (RHK). It is based on the Sequencing Batch Reactor (SBR) process and enables maximum capacity increase in the smallest space. The highlight is a special aerobic granular biomass. The large surface area of the granulate allows for a significantly higher population of wastewater-purifying microorganisms and thus a much faster and better purification. All processes run simultaneously; the faster settling speed of the activated sludge also contributes to the shortening of the cycle time.

The Nereda® technology combines cost efficiency with sustainability and compactness, giving it a clear advantage compared with conventional biological cleaning processes. Nereda® plants require significantly less space (25% smaller footprint), achieve energy savings of up to 50%, can dispense with additional chemicals and ensure stable, low-maintenance operation with excellent discharge values.

Bangu: large wastewater treatment plant with small footprint

These process and cost advantages of the Nereda® technology have also convinced the concessionaire Zona Oeste Mais Saneamento. The private concession founded by BRK Ambiental (responsible for the construction of the Bangu wastewater treatment plant) and Águas Do Brasil (responsible for the expansion of wastewater disposal in planning area No. 5 in Rio de Janeiro). The wastewater treatment plant in Bangu is designed for 144,000 population equivalents (p.e.) and has an operating area of 38,000 m². The contaminant load is supplied with a biological oxygen demand (BOD) of 150 mg/l, nitrogen bound (TN) of 35 mg/l and a total suspended solid (TSS) of 170 mg/l and achieves discharge values of <20 mg/l BOD, <5 mg/l NH4 and <10 mg/l TSS - an outstanding cleaning performance.

The pre-cleaning system consists of four parallel lines (four mm fine rake, sand trap, grease and oil extractor) with a capacity of 11,000,000 l/d each. The settled sand is transported into containers via a horizontal and a vertical snail and is then disposed of. Due to the extraordinarily compact design, approximately 30% of the footprint can

be saved compared to a solution with conventional primary clarifiers. The biological purification stage also manages with very little space. The two Nereda®-SBR basins each have a volume of 6,300 m^3 and a depth of 6.15 m and require a total installation area of 13,800 m^2. A conventional aeration tank with the same capacity of contaminant load is about 18,500 m^2 and is thus about 35% larger, which in turn leads to significantly higher investment costs.

Highly efficient rotary lobe compressors made by AERZEN

The compressed air for the biology in Bangu is provided by five AERZEN rotary lobe compressors, type Delta Hybrid D 152S with a drive power of 200 kW each (volume flow between 2,600 and 6,286 Nm^3/h, differential pressure = 700 mbar): two packages each for one SBR reactor, one machine serves as redundancy. Rotary lobe compressors - or also called screw blowers - are among the most innovative solutions in compressor technology. They combine the advantages of blower and compressor technology in one system and are by far one of the most efficient packages for a wide control range of 25% to 100%. For the three phases of the Nereda® process - aeration, sedimentation, feeding - the optimum oxygen supply can thus be guaranteed at all times.

Whether aeration tank or sludge treatment: efficiency is the most essential thing

The AERZEN compressors are free of oil and free of absorption material. This guarantees 100% reliability. Silencers without absorption material successfully prevent contamination of the process air or the downstream process system. This is a crucial factor for sustainable, safe and long-lasting operation. The compact design of the Delta Hybrid D 152S also enables a space-saving side-by-side installation, resulting in a smaller machine room and thus less investment in the building. The wide control range of

> Rotary lobe compressors are among the most innovative solutions in compressor technology.

From left: Rainer von Siegert (Managing Director at AERZEN do Brasil), Jose Pedroso (Mechanical Engineer of the Bangu wastewater treatment plant), Markus Leidinger (Wastewater Manager EMEA at AERZEN) and Emilio Martins (AERZEN representative in Rio - Messrs. Polypar)

the rotary lobe compressors is also of decisive importance. As a result, the footprint of the machine room is 20% smaller compared to other blower technologies - even though the D 152S is the largest rotary lobe compressor AERZEN has in its portfolio.

Delta Hybrid rotary lobe compressors from AERZEN are even used in sludge treatment, however, in a smaller version. The sludge is dewatered with the help of three centrifugal presses; two D 24S with a volume flow of between 560 and 1,400 m^3/h and a differential pressure of 500 mbar assist in the deammonification. The energy-efficient AERZEN packages were chosen because of their relatively long running time of five to six hours a day.

Energy savings of 15 percent

AERZEN packages stand for maximum performance, reliability and economy and are a guarantee for maximum energy efficiency and minimum life-cycle costs - issues which are becoming increasingly important. "When choosing blower technology, many only look at the initial costs. This is fatal, because the purchase price accounts for only five percent of the total operating costs. The costs for energy, service and maintenance are much more important. Energy consumption in particular has an enormous impact of 90%," says Rainer von Siegert, Managing Director at Aerzen do Brasil, and emphasises: "Anyone who wants to keep life-cycle costs as low as possible should therefore also consider the follow-up costs. Energy-saving and service-friendly packages are the most important thing here."

Lower costs despite higher CapEx? The fact that this calculation works out is made clear by the example of Bangu. Compared to international competitors, the AERZEN compressors were 15% more expensive in the CapEx area, but thanks to the excellent OpEx balance - 7% lower energy costs and significantly lower service and maintenance costs - the 15% additional costs are already amortised after five years. Compared to a competitor solution the five AERZEN rotary lobe compressors D 152S save around 60.000 kWh per year. Mechanical Engineer Jose Pedroso of Zona Oeste Mais Saneamento is correspondingly satisfied: "We are happy to have AERZEN as partner on our side. We expect energy savings of 15% over the next 30 years and look forward to an excellent repair and maintenance service." ○

Nereda® conquers the world

Nereda® is still a fairly young technology, but it has the potential to change the wastewater industry for good. Around the globe, more and more plants are being built based on the innovative Dutch concept. Royal HaskoningDHV is also taking a new approach in terms of support and monitors all Nereda® installations centrally by means of Global Digital Monitoring. This ensures reliable and long-term wastewater treatment plant operation. Experience has shown that this strategy is working. More than 90 Nereda® plants have been built in 20 countries, and all of them are still in operation. In Brazil, too, the number of Nereda® plants is continuously increasing. Another large-scale project, comparable to Bangu, is currently under construction in the municipality of Lontra in the state of Tocantins. Six highly efficient AERZEN Delta Hybrid D 152S packages will be installed there, with BRK Ambiental also being the plant manufacturer. And the cooperation between AERZEN and BRK Ambiental continues: numerous projects are in the planning stage, under construction or about to be finalised.

Further information

More about Royal HaskoningDHV:
www.royalhaskoningdhv.com

More about BRK Ambiental:
www.brkambiental.com.br

More about the Nereda® conzept:
https://nereda.royalhaskoningdhv.com

Nereda® Preferred Supplier **AERZEN**

As the world's only official Nereda® supplier for aeration technology (Preferred Supplier since September 2019), AERZEN supports the global wastewater industry with process-safe and forward-looking solutions. "AERZEN is the blower manufacturer of choice for most of our customers and offers a wide range of high quality solutions, meeting the requirements of almost all Nereda® projects. In addition, with AERtronic and AERprogress , there are innovative strategies for optimising the efficiency and availability of the packages. This is important for every aerated system and is in line with one of the main focuses of Nereda® technology, energy efficiency," Annie Blissit, Manager of the Nereda® Preferred Suppliers Programme, points out and adds: "Furthermore, AERZEN is an exceptionally cooperative partner. Not only do they actively think about new solutions and improvements to the overall offering with our team, but they are also very responsive and always ready to assist our customers with any aeration issues."

Water and wastewater treatment applications:
https://www.aerzen.com/applications/water-and-waste-water-treatment.html

AERZEN rotary lobe compressor Delta Hybrid:
https://www.aerzen.com/product/screw-blowers-delta-hybrid.html

New product line organisation

AERZEN gets fit for the future

AERZEN is growing strongly - and we have you, our customers, to thank for this. To ensure that you can continue to rely on our guiding principle "AERZEN - Expect Performance" in the future, we are aligning our entire group of companies completely, and even more consistently, with your needs.

AERZEN is one of the leading global application specialists in the handling and compression of gases with energy-efficient and resource-conserving blowers and compressors. In order to maintain and further expand this competitive position, we want to, among other things, deliver better and faster and become even more innovative. Our goal is to ensure the comprehensive fulfilment of individual customer expectations at every step in all business processes.

One of the most important steps on this way is the organisational restructuring of five product lines at Aerzener Maschinenfabrik GmbH. Each of these product lines - Standard Products, Modified Products, Process Gas, Turbo Blowers and Rental Solutions - is organised in such a way that it can manage its business independently and autonomously, from product development to after sales and services. The product lines are in close and constant dialogue with the worldwide AERZEN sales companies in order to translate the requirements of you, our customers, into the desired and future-oriented solutions.

We are certain that the reorganisation has laid the foundation for customer-centred thinking and action - so that in the future it will rightly be called: "AERZEN - Expect Performance". ○

Klaus-Peter Glöckner, Bjorn Irtel
(Managing Directors, Aerzener Maschinenfabrik GmbH)

The **AERZEN** product lines

Standard Products

"Standard Products", the product line created as part of the AERZEN reorganisation, is responsible for large-scale production primarily of standard packages and stages. Our focus is mainly on implementing short delivery times and ensuring the rapid availability of standard products for our customers. In order to meet these requirements, we see ourselves even better positioned today than in the past. Customer orientation is the overriding principle both in the reorganisation and in all other measures, which we will implement in our product line in the coming years. This applies to investments, but also to the optimisation of structures and processes.

Product Line Manager
Urs Beckmann

Product Line Manager
Dr. Uwe Seidel

Modified Products

The customers of AERZEN product line 2 create their own specifications, which have to be fulfilled with technical modifications from the industrial blower and compressor sector. The speciality of this product line is to provide advisory support and to seriously address clients' requirements. Furthermore, all processes are geared towards offering suitable product solutions, handling orders appropriately in all production steps and also supporting with viable After Sales solutions worldwide. We provide this for displacement stages, packages and entire system solutions in air and gas applications.

Process Gas

AERZEN is already well represented in the process gas business in many regions of the world. The reorganisation now enables AERZEN to focus even more on the specific needs of industries working with process gases. To this end, we have defined several key industries and focus regions in the process gas product line to which we offer our core applications. AERZEN is striving to become the world market leader in hydrogen applications for screw compressors. In order to achieve this, the market launch is to take place this year. We will also launch a large-scale sales campaign for our process gas solutions, focusing on services for our customers.

Product Line Manager
Dr. Martin Pfund

Product Line Manager
Stephan Brand

Turbo Blowers

In 2010, we acquired the Turbo technology - a visionary decision that has proven to be absolutely right, because the Turbo is an important and decisive product for our customers and applications today. Due to their outstanding energy efficiency, turbo blowers are being used more and more not only in wastewater technology, but also in many other industrial sectors. And against the backdrop of climate change, as well as rising energy costs, the topic of energy efficiency will become much more important worldwide - and here the AERZEN Turbo is already the solution for tomorrow.

Rental Solutions

In the interest of customer orientation, Aerzen Rental Solutions focuses on providing customers with complete system solutions for any type of temporary requirement, whether planned or ad hoc. AERZEN sees itself as a consultant and at the same time as a supplier of complete solutions. Everything is done from a single source, which distinguishes us from other rental companies. This is the key to winning and retaining customers today and in future. Aerzen Rental Solutions continuously develops and completes its portfolio of solutions thanks to AERZEN products, but also by close cooperation with leading service and equipment providers. When we started, we only provided AERZEN products for rental, but today we offer complete stand-alone wastewater oxygen supply systems, drying systems and much more.

Product Line Manager
Gerben Keurentjes

Energy-efficient blower technology pays for itself after just one year

Individual ROI calculations from **AERZEN**

The energy-saving potential of wastewater treatment plants is often underestimated. With individual ROI calculations (Return on Investment), AERZEN illustrates the considerable cost benefits of highly efficient blower technology in the biological treatment stage and shows what short payback periods can be achieved.

Wastewater treatment plants have a high energy demand. 60 to 80 percent of the total electrical energy consumed is used for ventilation of the aeration tank. A switch to state-of-the-art blower technologies with the highest possible energy efficiency as well as smart, demand-oriented control and regulation technology therefore offers great leverage for reducing the total cost of ownership. At the same time, by investing in resource-saving technology, wastewater treatment plant operators are making an active contribution to greater environmental protection and a significant reduction in CO_2 emissions. But how high is the savings potential really and when do the additional costs of the investment pay off?

High savings, short payback times

Many wastewater treatment plant operators still focus primarily on the acquisition costs of the blowers. But the purchase price accounts for only five per cent of the total costs for an operation of more than 10 years. The costs for energy, service and maintenance are much more important. Above all, it is worthwhile to look at energy consumption, because at 90%, this is the main cost factor. With individual ROI calculations, AERZEN illustrates the considerable cost benefits of highly efficient blower technology and shows what short payback periods can be achieved. For example, by changing from a conventional Delta Blower GM 35S positive displacement blower with a motor rating of 55 kW to an innovative Delta Hybrid D 30S rotary lobe compressor with a motor rating of 37 kW, around 25% energy can be saved (volume flow: 24 m^3/min, differential pressure: 800 mbar). At an electricity price of 0.30 euros/kWh, the investment pays for itself after just one year.

Many wastewater treatment plants tie up resources due to outdated or oversized machine technologies for

The performance calculator on the AERZEN website shows the individual savings potential.

Click here for the **Online Performance Calculator**

LET'S TALK
Find your local contact
www.aerzen.com/worldwide

ventilating the aeration tanks. An ROI calculation makes the cost advantages of resource-efficient concepts transparent and thus supports wastewater treatment plant operators on their way to more sustainable wastewater treatment.

Through the possible interaction of Delta Blower, Delta Hybrid and Aerzen Turbo, AERZEN realises individual blower solutions for oxygen supply in clarification tanks according to demand. Energy savings of up to 30% are possible.

First-hand knowledge

AERZEN at the KROHNE Academy Germany Tour

In cooperation with AERZEN, WILO, PHOENIX CONTACT, VIDEC and E.QUA, the KROHNE Academy is organising an interdisciplinary seminar series on the topic of **"Safety and efficiency enhancement in water supply and wastewater disposal"** in spring 2023. It is aimed equally at planners, maintenance personnel and operators of plants in the water industry and gives you direct access to the know-how and many years of experience of leading suppliers in the field of water supply and wastewater disposal. In addition to the basics, special applications, possibilities for increasing efficiency and potential savings will be discussed. In addition, you will receive an overview of valid regulations and current trends.

The organisers' experts will answer your questions and advise you on specific process applications. The aim is to support you in your decisions regarding system design, maintenance and service concepts. In addition to the lecture series, you can expect an extensive exhibition that will give you direct insights into the technology. The topics of energy and energy efficiency, subsidy management and project management are becoming increasingly important.

Register now for free: **krohne.link/academy-water**

The dates:

21 March: Hamburg, Volkspark Stadium
23 March: Bielefeld, LENKWERK Bielefeld
28 March: Hof, Freiheitshalle Hof
30 March: Hedersleben, Hedersleben Monastery

100% availability, 0% problems

AERZEN packages ensure reliable transport processes at A+S BioTec GmbH

Availability and reliability have top priority at A+S BioTec GmbH. For this reason, the Saarland-based family business has exclusively used blowers and compressors from AERZEN for the pneumatic conveying of its raw materials and products for more than 50 years. The packages provide absolutely oil- and absorption material-free air and guarantee a safe, reliable material flow. Service and support are also excellent in every respect.

Whether oat flakes, apricot kernels or bran: when it comes to the production, processing and refinement of raw materials for the food, cosmetics, technology and pharmaceutical industries, no one can ignore A+S BioTec GmbH. The family-owned company with headquarters in Völklingen, Saarland, specialises in grinding, drying, sieving, mixing, roasting and packaging and is one of the leading companies in this branch. A+S BioTec also makes no compromises when it comes to blower technology and has relied on the robust and reliable packages from AERZEN for over 50 years. Approximately 40 Delta Blower positive displacement blowers and two Delta Screw compressors guarantee maximum safety and availability in pneumatic conveying of powdery and small-grained materials.

Development, production and finishing for large-scale industry

A+S BioTec is part of the globally active Abel+Schäfer Group, which was founded as a milling company in 1892. The company looks back on a long tradition, is characterised by innovations and is still family-owned today. In the

meantime, the fifth generation has been steering the fortunes of the traditional company. Abel+Schäfer was one of the first manufacturers worldwide to launch baking premixes on the market in the middle of the 20th century and has been successfully serving the growing demand ever since. Today, the group of companies produces at 14 locations around the globe.

In Völklingen, the focus is still on mill technology. The core areas here are on comminution as well as mixing and drying. The spectrum ranges from powdered raw materials to fermented or thermally treated to protein-enriched products. Of course also in organic, kosher and halal as well as GMO- and allergen-free. In addition to its own products, A+S BioTec makes its modern, flexible technology as well as its know-how and manpower available to contract customers as part of contract manufacturing services.

A+S BioTec at the Völklingen site is a specialist in the development, manufacture and refinement of raw materials and products.

Oil-free conveying air for transport from A to B

From the delivery of the raw material to the finished end product, the materials go through several process steps and sometimes have to travel long distances for this. For example, the piping from the feed hopper on the ground floor extends over five floors until it reaches the pre-silo for grinding under the roof. Even the transport after grinding to the bagging plant, where the filling into 25 kg bags or big bags takes place, is not exactly a stone's throw. This is where the positive displacement blowers from AERZEN come into play. The approximately 40 Delta Blowers provide air which is absolutely free of oil and absorption material. With volume flows between 3 and 20 m^3/min, a conveying speed of 25 to 30 m/s and a conveying pressure of 300 to 500 mbar, they ensure efficient, gentle and reliable transport of the sensitive bulk materials.

"We produce 24 hours a day, five days a week. This is why we need 100 per cent machine availability," emphasises Horst Schweitzer, Technical Manager at the Völklingen site. Reliability has top priority, and so has low downtime. "For this reason, we have been using AERZEN blowers exclusively for more than 50 years. These machines are powerful, robust, need only little maintenance and are durable. It just fits nicely," says Horst Schweitzer and adds: "What I particularly appreciate about AERZEN is the availability of the employees. When the going gets tough, we have a contact person available at all times. A great product and a great team."

The blower cellar houses the majority of the AERZEN packages.

> AERZEN machines are powerful, robust, need only little maintenance and are durable. What I particularly appreciate about AERZEN is the availability of the employees. When the going gets tough, we have a contact person available at all times. A great product and a great team.

Horst Schweitzer,
Technical Manager at the A+S BioTec Völklingen site

In micronisation, the products are finely ground. Positive displacement blowers made by AERZEN are used for the discharge (silver pipe).

Via the bent silver pipe, the end product enters the pre-silo for bagging.

Via the silver pipe, the raw material is transported by AERZEN conveying air from the ground floor up to the fifth floor in the pre-silo for grinding.

Truck unloading station: AERZEN air is blown into the silo vehicle via one pipe, and the delivered goods are transported into the silos via a second pipe.

Delta Blower: first choice for generating pneumatic conveying air

Positive displacement blowers made by AERZEN are characterised by high efficiency, low maintenance costs, reduced life-cycle costs, compactness as well as easy handling. They are considered the first choice for generating pneumatic conveying air due to their high quality and reliability. These blowers achieve intake volume flows between 30 and 15,000 m^3/h with a control range of 25% to 100% and conveying pressures with a differential pressure of up to 1,000 mbar(g). The drive concept with belt drive enables optimum volume flow design, and subsequent power adjustments can also be implemented quickly and easily. A+S BioTec GmbH and its production facility use this flexibility in order to react in a fast and easy way to customers' needs.

AERZEN is certified according to ISO 22000 for food, guarantees oil-free operation according to ISO 8573-1, class 0 and trusts in silencers without absorption material. This means that AERZEN machines meet the highest food safety requirements and guarantee 100% product purity. The process air is guaranteed free of impurities such as oil, abrasion or insulation material.

In addition to the 40 positive displacement blowers, the Saarland company also uses two screw compressors of the Delta Screw series with start unloading device. The single stage packages can overcome a differential pressure of 3,500 mbar and are thus the perfect choice for unloading the delivering silo vehicles high up into the silos.

Annual maintenance guarantees optimum availability

Thanks to bespoke offers for every phase of the machines' lives, AERZEN supports its customers in the maintenance and servicing of their packages. Abel+Schäfer at the Völklingen site also likes to rely on the know-how of AERZEN service technicians and has all blowers and compressors inspected thoroughly once a year. The maintenance work includes, among other things, changing the oil, changing the suction filter and replacing the components for the power transmission (V-belts, clamping bushes). The condition of the packages is also examined and possible need for repair is determined. "The maintenance contract is a great advantage for us. This allows us to concentrate on our core tasks and at the same time benefit from optimal availability," Horst Schweitzer makes clear and is pleased: "Since we have had the maintenance contract - that is, for about ten years - there has not been a single machine failure."

AERZEN once, AERZEN always!

A+S BioTec GmbH is at home in the food world, but also produces for the cosmetics and technology industries. And the tendency is increasing, because natural, plant-based materials - as they are exclusively processed in Völklingen - are in vogue. For example, specially processed flour is needed for glue production, crushed grain husks for plastic profiles or ground apricot kernels for face and body scrubs.

New fields of application, new methods, new processes: A+S BioTec GmbH grows with the requirements of its customers. One thing, however, will not change in the near future: the blower technology for pneumatic conveying comes from AERZEN. Horst Schweitzer gets to the point: "When it comes to blowers, AERZEN is our partner. This is where we are well looked after!" ○

> When it comes to blowers, AERZEN is our partner. This is where we are well looked after!
>
> **Horst Schweitzer,**
> Technical Manager at the A+S BioTec Völklingen site

AERZEN packages ensure reliable bulk material transport. For more information about AERZEN pneumatic conveying applications, simply scan the QR code.

At the end of 2022, Aerzen Rental Solutions moved into its new European headquarters in Duiven near Arnhem in the Netherlands.

Aerzen Rental Solutions is equipped for the future

New headquarters for the European rental business commissioned

A success story began when AERZEN entered the rental machine business by founding Aerzen International Rental B.V. in 2000. Aerzen Rental Solutions has since grown steadily and become active in more and more European countries. In order to be even better equipped to meet future challenges, the team of around 30 employees, led by Managing Director Gerben Keurentjes, moved into a new building as planned at the end of 2022.

Thanks to the optimal conditions at the new location, we can provide our rental solutions to customers even faster and more efficiently.

Gerben Keurentjes,
Managing Director Aerzen Rental Solutions

The new European headquarters of Aerzen Rental Solutions is located only about two kilometres from the previous site, also in Duiven. A modern structure which includes office space and a workshop, as well as demarcated areas for cleaning and testing, has been built on a plot of land of around 7,100 m^2. There is sufficient storage space for the rental products on a generous open area between the buildings.

For Gerben Keurentjes, the new building, which is to be officially inaugurated later this year with a customer event, is also a strategic signal: "The rental business of Aerzen Rental Solutions will continue to gain importance in the AERZEN Group in the future, which is once again underlined by the new building. Thanks to the optimal conditions at the new location, we can provide our rental solutions to customers even faster and more efficiently."

The Aerzen Rental Solutions team will continue to offer customers comprehensive services in the rental machine business from the new domicile.

The storage areas are also spacious and modern.

Aerzen Rental Solutions offers a comprehensive range of 100% oil-free rental machines plus accessories, as well as complete solutions for numerous industries. Several depots in Europe ensure deliveries to customers all year round, every day around the clock. In addition to its headquarters in Duiven, Aerzen Rental Solutions has locations in Germany (Rinteln), Spain (Madrid), Great Britain (near Birmingham), Sweden (near Stockholm), France (south of Paris) and the USA (Atlanta). Further expansion of the rental business is planned for 2023 in Mexico and in the Asia-Pacific and Middle and Near East regions.

Aerzen Rental Solutions offers service and provision of rental solutions around the clock.

Special products for the rental market

Aerzen Rental Solutions holds the entire AERZEN machine portfolio for low pressure and compressed air applications in pressure ranges from -700 mbar (g) negative pressure to 10 bar (g) positive pressure - from turbo blowers to positive displacement blowers and rotary lobe compressors to single and two-stage compressors. In addition, there is a wide range of accessories, including power generators (transformers/diesel generators), power distributors, power cables, piping, coolers (air-to-air coolers, water-to-air coolers), dryers and condensate separators.

The products from Aerzen Rental Solutions are specially developed for rental use: they are always modular and therefore easy to connect, easy to transport and robust to simplify handling. The machines are equipped with complete control and regulation technology as standard. Special interfaces facilitate integration into the customers' process control.

Additional information

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Aerzen Rental Solutions

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Hotline 24/7: +1 844 400 2379
E-mail: rental-usa@aerzen.com

New Managing Director **Aerzen** Rental DACH/Luxembourg

Michael Stemmermann

In mid-October 2022, Michael Stemmermann took up his position as Managing Director at Aerzen Rental Deutschland GmbH in Rinteln with responsibility for the DACH/Luxembourg region. He works closely with the Aerzen Rental headquarters in the Netherlands as well as the international Aerzen Rental organisations and Aerzen subsidiaries to offer customers the best possible solutions across countries.

Michael Stemmermann, whose qualifications include training as a technician, worked for many years in various positions in sales and in the rental of technical products. He led international sales organisations as well as teams in product management and service and was involved, for example, with the introduction of oil-free compressors in rental. Most recently, he served as Managing Director DACH for an HVAC (Heating, Ventilation, Air Conditioning) equipment rental company.

> We see another strong market ramp-up in green hydrogen as very realistic. This assessment is also consistent with the opinion of our clients, whom we support in the development of projects at various stages of planning.

Michael Leitsch,
Head of Opportunity Engineering AERZEN

With the newly developed VRW 536M screw compressor, AERZEN can realise significantly higher differential pressures and efficiencies in hydrogen compression.

Hydrogen compression with screw compressors

Versatile and reliable

If hydrogen is produced by atmospheric electrolysis, it must be compressed to a certain pressure for the subsequent processes. Screw compressors in the low-pressure range have economic advantages, particularly with increasing volume flows and at fluctuating operating conditions.

Hydrogen occurs in bound form in nature and must, therefore, be produced using energy. Up to now, hydrogen has mainly been produced from natural gas and coal have dominated as hydrogen carriers. Alternatively, hydrogen can be produced by water electrolysis. If the electricity used for this comes from renewable energy sources, it is called green hydrogen, which is CO_2-neutral.

AERZEN considers green hydrogen to be an important future market, as the avoidance of CO_2 will become increasingly important in the future. At the same time, new perspectives are opening up, for example in power generation. Here, hydrogen as an energy carrier and storage medium can enable a further increase in the share and availability of renewable energies. Other areas are transport, especially long-distance and heavy-duty transport, but also rail transport, shipping and aviation, as well as heating and use in process heat, mainly in the metalworking industry.

Strengths of screw technology

Due to the displacement principle, screw compressors are also suitable for compressing very light gases, in contrast to turbomachines. Moreover, screw compressors are rotary machines which, compared to reciprocating compressors, have fewer moving parts, a much smaller space requirement and a considerably reduced effort for maintenance and for the compensation of pulsations induced in the piping. Another important advantage is the possibility of injecting water into the conveying chamber. On one hand, this makes it possible to reduce the heat of compression, and on the other, water can act as a sealing medium between the oil and gas chamber, for example when using a water-purged mechanical seal. Since the hydrogen leaves the electrolysis in a water-saturated condition anyway, the injection of water is not critical.

Screw compressors can play a decisive role, especially for pre-compression in atmospheric electrolysis plants - especially for large installed electrolysis capacities from circa 50 MW, which corresponds to a volume flow of approx. 11,000 m^3/h. Piston compressors usually reach their limits in terms of size with these quantities. Today's plants are getting bigger and bigger, reaching up to several 100 MW. ○

Michael Leitsch (Head of Opportunity Engineering AERZEN)

Solutions from AERZEN

As process gas specialist, AERZEN has been dealing with the topic of hydrogen compression for decades, as it occurs as a component in gas mixtures for typical process gas applications, for example in hydrogen recovery in PSA applications or in direct reduction plants for steel production. For certain chemical applications, the company has successfully launched screw compressors for pure hydrogen compression.

AERZEN offers both oil-flooded and oil-free (water-injected and dry) compressor series for a wide range of process gases. AERZEN also supplies Roots-type process gas blowers in various pressure ranges. These can, for example, convey the moist oxygen from water electroanalysis to industrial customers such as wastewater treatment plants, cement works or glass producers. Further information can be requested at prozessgas@aerzen.com.

Whitepaper to download
Detailed information on the topic of "Hydrogen compression with screw compressors"

Why **AERZEN** relies on air foil bearings instead of magnetic bearings for its turbos

Simple and effective

For the sophisticated bearings inside turbo blowers, AERZEN uses neither oil nor other lubricants, but air. Steffen Helmert, Product Manager Turbo Blowers, explains the reasons for this and why AERZEN does not use magnetic bearings.

ComPress: Mr. Helmert, how does air foil bearings work in AERZEN turbo blowers?

STEFFEN HELMERT: As an effective bearing without any mechanical friction at all, AERZEN uses compressed air in the two radial drive shaft bearings and the thrust bearing for absorbing the axial forces. The compressor principle is used in a simple way. Due to certain unbalance, when starting the turbo blower, the rapidly rotating shaft generates an eccentric circular motion in the air gap of the bearing. With the minimal distance to the bearing wall, the shaft increases the pressure in this area, and counterforce is generated in the form of an increase in pressure. This forces the shaft back in the opposite direction. Due to the rapidly increasing speed the shaft centres in the bearing itself and increases the pressure in the air gap to more than 30 bar. The prevailing force couples are so high that they keep the shaft permanently in the centre of the bearing, even during considerably varied and challenging operational conditions, and although takes place in free-floating manner without surface contact. The genius of this principle is that the air cushion forms by itself during operation - and, thus, without any further energy input.

> With the air foil bearing principle, no electrical, mechanical or pneumatic controls are necessary, even for dynamic load changes.
>
> **Steffen Helmert,**
>
> Product Manager Turbo Blowers

ComPress: What are the features of a magnetic bearing that other manufacturers' turbo blowers use?

HELMERT: Turbo blowers from other manufacturers work with magnetic bearings, which also aim to overcome the high speeds without any mechanical bearing. However, this requires electrical energy so that the coils arranged in a ring around the drive shaft can develop their magnetic forces during operation and, thus, allow the shaft to rotate free of mechanical friction. In particular, variable operational conditions put the highly complex regulation system of the magnetic bearings to the test. It can result in frequent safety shutdowns of the entire turbo blower due to technological reasons. To ensure that this system remains active for a certain time in the case of a system malfunction, emergency stop or power failure, turbo blowers with magnetic bearings must always be equipped with a temporary power accumulator. This serves to reduce the high operating speed before the shaft falls into the so-called mechanical emergency bearings.

ComPress: Nonetheless, critics observe that when the turbo blower is started, the driven shaft rests on the bearing and develops wear friction until the air cushion is formed. What do you say to that?

HELMERT: AERZEN is addressing this theoretically existing disadvantage with innovative air foil bearings. For this, we use a two-component coating as a maintenance-free friction partner. One of these materials is polytetrafluorethylene. PTFE is a thermoplastic, which, due to its very low coefficient of friction, is used as a non-stick coating. With PTFE, we virtually create a lubricating film without grease and oil. Because the compressor effect in the bearing compacts the air so densely that the layer between bearing ring and shaft is practically as hard as steel, AERZEN has designed a damping layer specifically for this application. This is a millimetre-thick sheet of metal - also known as spring foil - which is rolled in a wave-like manner to support the sliding layer of the bearing and at the same time absorb vibrations.

ComPress: What are the decisive advantages of AERZEN air foil bearings?

HELMERT: With the air foil bearing principle, no electrical, mechanical or pneumatic controls are necessary, even for dynamic load changes. The AERZEN bearing type still has reserves to support higher speeds than are usually possible with magnetic bearings. The long service life of more than 80,000 operating hours, the complete freedom from maintenance and the high level of functionality without any peripherals are other decisive advantages of the bearing solution used in AERZEN turbo blowers. ○

LET'S TALK Visit **AERZEN** Worldwide trade fairs 2023

March 2023

Tausendwasser
15./16. March
Berlin, Germany
www.messe-tausendwasser.de

Maintenance Antwerpen
22./23. March
Antwerp, Belgium
www.maintenance-expo.be

Water Philippinen
22.–24. March
Manila, Philippines
www.waterphilippinesexpo.com

Solids Dortmund
29./30. March
Dortmund, Germany
www.solids-dortmund.de

April 2023

Hannover Messe
17.–21. April
Hanover, Germany
www.hannovermesse.de

Hydrogen + Fuel Cells EUROPE
17.–21. April
Hanover, Germany
www.h2fc-fair.com

IFAT Eurasia
27.–29. April
Istanbul, Türkiye
www.ifat-eurasia.com

May 2023

Ozwater
10.–12. May
Sydney, Australia
www.ozwater.org

Maintenance Dortmund
24./25. May
Dortmund, Deutschland
www.maintenance-dortmund.de

June 2023

66° Congreso Internacional de Agua, Saneamiento, Ambiente, y Energias Renovables
7.–9. June
Bogotá, Colombia
https://congresos.acodal.org.co

Solids Parma
14./15. June
Parma, Italy
www.solids-parma.de

Propak Asia
14.–17. June
Bangkok, Thailand
www.propakasia.com

H2 Hydrogen Expo
20./21. June
Rio de Janeiro, Brazil
www.hydrogenexpo.com.br

Status February 2023

September 2023

Aquatech
5.–7. September
Mexiko City, Mexico
www.aquatechtrade.com/mexico

Water Indonesia
13.–16. September
Jakarta, Indonesia
www.waterindonesiaexpo.com

Powtech
26.–28. September
Nuremberg, Germany
www.powtech.de

Turbomachinery Show
26.–28. September
Houston, USA
https://tps.tamu.edu

H2 Hydrogen Technology Europe Expo
27./28. September
Bremen, Germany
www.hydrogen-worldexpo.com

October 2023

Weftec
02.–04. October
Chicago, USA
www.weftec.org

Fenasan
3.–5. October
São Paulo, Brazil
www.fenasan.com.br

Expo Agua & Sostenibilidad
4.–6. October
Lima, Peru
www.expoaguaperu.com

Pollutec
10.–13. October
Lyon, France
www.pollutec.com/en-gb/de.html

Viet Water
11.–13. October
Ho Chi Minh City, Vietnam
www.vietwater.com

IFAT India
18.–20. October
Mumbai, India
www.ifat-india.com

Aqua Suisse
25./26. October
Zurich, Switzerland
www.aqua-suisse-zuerich.ch

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