The cement industry is responsible for around 8 percent of global CO\textsubscript{2} production. In 2020, this amounted to 2.17 billion tonnes of CO\textsubscript{2} out of a total production of 4.1 billion tonnes of cement. The industry has committed to reducing CO\textsubscript{2} emissions to 0.48 tonnes of CO\textsubscript{2} per tonne of cement by 2030, a reduction of 5.5 percent - an ambitious goal. Estimated cement production will be around 4.8 billion tonnes of cement by 2030.

The cement industry has committed itself to significantly reducing CO\textsubscript{2} emissions.

AERZEN know-how for the cement industry

As a specialist for applications in the cement industry, AERZEN not only offers its proven blower, compressor and turbo technologies, but also supports the industry with advice. Over the years, AERZEN has been involved in numerous renewal, expansion and optimisation projects for cement manufacturers worldwide. The know-how we have acquired feeds through into the new white paper, which deals with processes for the most sustainable, CO\textsubscript{2}-reduced cement production possible.

The white paper “Sustainable and resource-efficient processes in cement production” is available for download at www.aerzen.com. For quick access, simply scan the QR code on the right. The 30-minute free web seminar “AERZEN Technologies for Pyro-Processing Optimisation in Cement Plants” can be found at www.aerzen.com/news/webseminars.html or by scanning the QR code on the left.

Dear Readers,

We would like to thank you for your patience and for the loyalty you have shown us over the past few weeks during which we were crippled by a hacker attack. We are now well on our way back to full operating capacity and are confident that, despite all the problems of the past weeks, we will emerge stronger from this crisis. As usual, we would like to assist you in both word and deed, and find the best solutions for you with regard to energy efficiency, operating costs, serviceability and sustainability.

As customers, you are our most important partners, and we at AERZEN want to and must live up to this claim once again. So we are happy to support you in the energy modernisation of your plants - for example with innovative container solutions for outdoor installation as at the Oschersleben wastewater treatment plant.

Please access our white papers and the various webinars mentioned in this new edition of COM PRESS and use them as the starting-point for implementing your customised solution together with AERZEN.

We hope you enjoy reading this issue.

Best wishes

Sascha Adam,
Chief Financial Officer AERZEN Deutschland

David Salazar, AERZEN Application Management Pneumatics, is the author of the white paper on cement.
Wastewater treatment plants are usually the largest energy consumers in municipalities. Nevertheless, the focus to date has been almost exclusively on security of supply and purification performance (compliance with monitoring values). Efficiency was not an issue for a long time. At the same time, municipal wastewater treatment usually consumes 30 to 40 percent more electricity than necessary. The savings potential is therefore enormous. However, in view of rising energy prices, increased cost pressure and the targeted CO₂ reduction as a result of the Paris Agreement (65 percent less CO₂ emissions by 2030 compared to 1990 levels), energy and resource efficiency is increasingly becoming a decisive factor for wastewater treatment plant operators - and energy optimisation is thus a key priority.

Optimising ventilation is the key to more energy efficiency

The Trink- und Abwasserzweckverband (TAV, Drinking water and wastewater association) Liebenwalde has recognised the signs of the times and fundamentally modernised its wastewater treatment plant. "The assemblies should be placed differently, " says Wolffhard Raasch, Technical Manager of the Liebenwalde wastewater treatment plant. He explains why: "AERZEN blowers had already been used when the plant was built. Today, a quarter of a century later, some of them are still in operation and running like clockwork. The cooperation also works wonderfully. We are really very satisfied."

Rotary lobe compressors: the best of both worlds

At the Liebenwalde wastewater treatment plant, two Delta Hybrid D 62S rotary lobe compressors with an intake volume of 417 m³/min and a pressure difference of 480 mbar provide the compressed air supply in the aeration tank. Rotary lobe compressors or screw blowers are among the most innovative solutions in compressor technology. They combine the advantages of blower and compressor technology in one system. The decisive factor for the Delta Hybrid application in Brandenburg was the possibility of outdoor installation. "The assemblies should be placed directly at the basin without housing," says AERZEN sales engineer Christian Meyer. "The Delta Hybrid are very well suited for outdoor use. Thanks to their galvanised steel construction, powder coating, as well as a sealed acoustic hood design with a sophisticated air ducting inside, they are optimally designed for wind and weather and also cope effortlessly with the 2H5 load typical of wastewater treatment plants. An oil sump was also installed, so that the environment is not polluted in the event of an accident or when changing the oil. Outdoor installation directly at the basin offers two main advantages: firstly, the connecting pipework can be extremely short, which reduces energy losses to a minimum. The second point concerns the temperature of the intake air. From a thermodynamic point of view, this should be as low as possible. However, a housing would have the opposite effect: the air around the assemblies would heat up with the result that it can no longer be optimally compressed. "As a rule of thumb, you can say that a temperature reduction of 3°C leads to an energy saving of 1 percent." Christian Meyer makes clear. "For this reason, by the way, our blowers always suck in the air on the "cold" side of the assembly and not on the "hot" side of the pressure connection, as there is a lot of radiated heat there."

Financing through subsidies

AERZEN also established contact between the Liebenwalde wastewater treatment plant and the industry platform e.qua. e qua is a network of municipal companies in the water industry with a focus on energy efficiency, energy (re)covery and resource management and has made a name for itself in particular as a funding scout. "Many wastewater treatment plant operators don't even know that they can apply for state subsidies for energy optimisation up to 80 percent. Even the preparation of the potential study, which is the basis for every subsidy application, is subsidised by 50 percent," emphasises e qua Managing Director Andreas Koschorrek. For the Liebenwalde wastewater treatment plant, e qua took over the entire funding management. It was the cooperation and collaboration between AERZEN and e qua which enabled the Liebenwalde wastewater treatment plant to make the investments in climate-friendly wastewater treatment in the first place.

The optimisation of the aeration system in the aeration tank was not the only major energy project. The installation of a 100 kWp ground-mounted photovoltaic system with battery storage and the construction of a sewage sludge humification plant were also implemented. With the PV system, one third of the wastewater treatment plant's electricity consumption is covered by renewable energy sources. The two-hectare sewage sludge humification plant also offers significant advantages in terms of climate protection compared to the old mechanical thickening plant. The higher dry matter content of 40 percent (previously: 6 percent) reduces the amount of transport required for agricultural use by a total of 90 percent. In addition, chemicals are no longer needed and electricity consumption is very low.

From energy guzzler to climate leader

For the Liebenwalde wastewater treatment plant, the investments in increasing energy efficiency and the use of renewable energies have more than paid off. For example, the plant’s energy consumption has been reduced from 40 kWH to 18 kWH per year. A look at the CO₂ emissions shows a saving of 62 percent. Overall, cost savings of €3,600 euros per year can be achieved. "The modernisation was exactly the right step. With the energy optimisation, we have made a real quantum leap and are optimally positioned for the future - thanks to the active support from AERZEN," says Wolffhard Raasch. He already has another goal in mind: "We want to become independent of external electricity suppliers and therefore plan to further expand photovoltaics. The future is called energy self-sufficiency."
AERZEN focuses on pragmatic solutions

Blower and compressor technology in slim ISO containers

Blower technology in containers has the potential to make process air supply noticeably leaner, more flexible and simpler. AERZEN has already gained many years of experience in this area from its own rental business – and is now combining this know-how into a new solution. The idea: compressed air from the ISO container.

Whether 20 or 40 feet long, ISO containers have the great advantage of being standardised - right down to uniform lifting gear and truck trailers. Containers are also easy to stack. They are statically self-sufficient and, of course, they are also available with effective sound insulation. AERZEN now combines these features with its blower and compressor technology, creating a convincing symbiosis of the latest machine technology and maximum flexibility. Thanks to this pragmatic solution, it will be possible in future to supply complete blowers or compressor stations for quick connection and commissioning on site.

The high power density of, for example, 24,000 m³/h compressed air per container with 3 x AERZEN Turbo AT 200 0.8s ensures versatile application possibilities per container unit in connection with a high control range. This aspect also opens the possibility of another hacker attack. Nearly all work-relevant processes have been restored as far as possible. Additional measures are currently being taken to secure the system.

Our sales and service staff around the globe are, of course, available for you at any time and are ready to help you with any questions or requests.

Working hours and capacities are being significantly expanded

In order to make up for the accumulated backlog by the end of the year, we are extending the working hours at our head office in Aerzen significantly.

We are working hard throughout the AERZEN Group to ensure that all employees will be able to return to the business operations you are familiar with by the end of the year. We seek your continued understanding and support in this extraordinary situation. If you have any questions or comments, please don’t hesitate to get in touch with your usual contacts at our company.

Management

Aerzener Maschinenfabrik GmbH

New Sales Manager Process Gas

Michael Leitsch took over as Sales Manager for Process Gas at the Opportunity Engineering Group at Aerzener Maschinenfabrik GmbH in February 2021. After successfully completing his mechanical engineering studies, he was able to gain valuable experience in the process gas industry. This includes various positions in sales and quotation engineering for process gas compressors, including several years in Asia. Most recently, he worked for two years as a project manager in a refinery. Leitsch works closely with the AERZEN Group’s global sales companies to provide AERZEN customers with customised process gas solutions.

New and revised marketing material

AERZEN has revised or created new marketing material especially for the application areas of wastewater treatment, food technology and process gas technology.

How can energy costs be saved in wastewater treatment? How can hygienically clean process air be generated? What requirements must modern process gas compressors fulfil? These are all questions that AERZEN customers have to ask themselves in the course of CO₂ reduction, Industry 4.0, globalisation and constantly increasing cost pressure. We support you in this and offer you answers to your questions with our new brochures. You can download the new editions as usual with CustomerNet access via our website or request a print version via our request form.

www.aerzen.com/company/request-and-contact/directory-of-contacts.html

The new brochures AERBlower, Food and Process gas technology

AERZEN container solutions offer maximum flexibility in use.
Compact, quiet, efficient: AERZEN supplies a ready-to-install blower solution for the Oschersleben wastewater treatment plant

Turbo air from the container

With the benefit of state funding, the Trink- und Abwasserverband (TAV, Drinking water and wastewater association) Börde is currently investing four million euros in a sewage sludge digestion plant to generate thermal and electrical energy. The aim of this is to reduce costs, protect the environment and keep prices stable for local citizens. Part of the overall project at the Oschersleben wastewater treatment plant involves the installation of new blower technology for the two aeration tanks. Today, three energy-efficient turbo blowers from AERZEN provide air - these have been installed inside a 20-foot sea container to save space.

Exactly 77 tonnes of CO₂ less per year: that is the premise behind the energetic renovation of the aeration tanks in the Oschersleben wastewater treatment plant. Three turbo blowers now operate instead of five positive displacement blowers. The TAV Börde has been able to reduce its energy demand significantly and is pleased about the co-financing of the initiative by the European Union. The town which is in the middle of the Magdeburger Börde, has just under 20,000 inhabitants. The wastewater treatment plant is designed for 48,000 population equivalents (PE), whereby the average capacity is currently 33,000 PE. "We still have capacity," says Olaf Wachsmuth, who is responsible for the modernisation project at TAV. The association has a total of 13 wastewater treatment plants, of which Oschersleben is the largest with an average inflow of 2,900 m³ per day of wastewater per day.

Five becomes three

The new blower technology replaces five positive displacement blowers that have been in operation since the first conversion of the wastewater treatment plant in 2000. At the time, the AERZEN Delta Blower type CM 35 S (2,388 m³/h, 90 kW max.) were designed for outdoor installation and equipped with a corresponding acoustic hood. High-frequency turbo machines are not designed to be directly exposed to wind and weather as standard. Consequently, in the course of the modernisation, the question arose as to where the assemblies would be located. Instead of building a costly machine house for this purpose, the decision was made in the winter to place the blower technology inside a standard container directly at the two aeration tanks. The compact dimensions of the 20-foot container made it possible to place the assembly largely on the existing foundations of the old blowers - which ultimately resulted in savings in civil engineering.

In Oschersleben, the "turbo container" is connected to the Aqualogic computer from Aqseptence. By means of sensors, this determines the oxygen demand in the two aeration tanks and then regulates the opening of slides in the supply air line. The higher-level AERsmart machine control system from AERZEN regulates the output of the three turbo blowers according to the prevailing pressure in the line. If the pressure drops, the air output increases; if it increases, it drops again. The integrated control system manages the optimal interaction of all three turbos for both aeration tanks. The use of three turbomachines creates the basis to reliably control peak loads on the one hand and to always have an assembly available as redundancy on the other.

Lots of air, in, little sound out

"It is about 180 metres, as the crow flies to the residential development," says Olaf Wachsmuth who says a noise protection survey was part of the approval process. "This involved measuring the old blowers and their sound propagation up to the nearest house." With the new ventilation technology, the TAV is noticeably quieter on the road. The sound-insulated container has proved just as effective as the AERZEN Turbo, which is quieter than the previous technology. To ensure that they do not run out of supply air, special splitter silencers are used. They are part of the AERZEN system and are designed to ensure the optimum air supply for the turbomachinery - and this with an effective sound insulation. At Oschersleben, this setup delivers 9,000 standard cubic metres per hour - i.e. 2,000 cubic metres per turbo blower. "We can also deliver 24,000 standard cubic metres out of one container with this setup," says Ingo Bartz. Even more powerful turbo blowers from AERZEN are still so small that three of them fit into the container. He adds, "That’s a lot of air performance with an extremely small footprint," emphasises the sales manager at Aerzen Turbo.

Conclusion

With the selection of an aeration solution based on turbomachinery, Oschersleben has succeeded in noticeably reducing the energy demand in biological purification. Those involved in the project expect a saving of around one third as a result of the conversion. This efficiency potential means that the operating costs of a technical solution are increasingly coming to the fore in tenders - and there’s less emphasis on the up front purchase price. "We calculated the required energy for all load cases and correlated the values over time, i.e. we weighted them accordingly over the operating times," explains Olaf Wachsmuth. The maintenance costs over five years of operation were also included in the evaluation of the best technical solution. The Turbos also scored well here. Installations in a container that can be quickly connected can also be used for future modernisation projects, as the assemblies can be put into operation at short notice and require little space.