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August 2023

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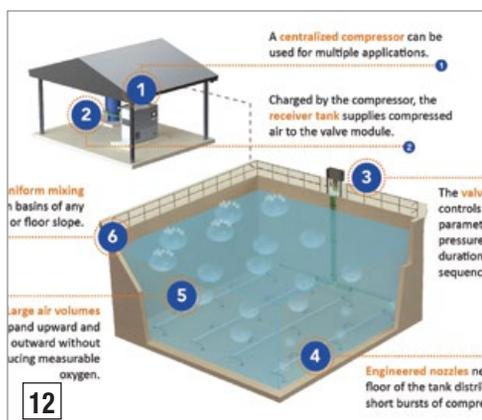
AERATION BLOWER SYSTEMS

12 Overcoming Aeration Turndown Limitations with Compressed Gas Mixing

By Sarah Elger and John Koch, EnviroMix



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INDUSTRIAL VACUUM & BLOWER SYSTEMS

20 Show Report: Pneumatic Conveying at the 2023 Powder Show

By Kimberly Hill, Blower & Vacuum Best Practices Magazine

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From the Editor



We invite our readers to take advantage of Early-Bird rates expiring in August and to register for the Best Practices 2023 EXPO & Conference, co-locating with Process Expo and taking place at McCormick Place in Chicago on October 23-25, 2023. Registration is now open, visit www.cabpexpo.com, one pass provides entry into both shows!

Industrial Vacuum & Blower Systems

Our staff member, Kimberly (Vickman) Hill visited the 2023 International Powder and Bulk Solids Conference and Exhibition (also known as the Powder Show) and has written an excellent Show Report. We hope you enjoy her review of her booth visits to manufacturers of pneumatic conveying systems and the blowers and vacuum pumps powering them.

Aeration Blower Systems

We'd like to thank Sarah Elger P.E. and John Koch P.E., from EnviroMix, for sending us their excellent article titled, "Overcoming Aeration Turndown Limitations with Compressed Gas Mixing." This article outlines lessons learned at a WWTP in Wisconsin "operating all eight of their activated sludge process trains year-round, despite having influent flows that are 23% of their 20-year design flow of 13.4 million gallons per day (MGD)."

Thank you for investing your time and efforts into **Blower & Vacuum Best Practices**.

RODERICK M. SMITH

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- **July 23, 2023:** Engineering Rooms for Aeration Blowers – *Presenter Tom Jenkins, P.E., President, JenTech Inc.*
Sponsored by APG-Neuros
- **August 4, 2023:** ASME PTC 13: Efficient Blowers, Sustainable Systems – *Presenters Tom Jenkins, P.E., President, JenTech Inc., and John Conover, Business Development Manager, Air Clean USA*
Sponsored by Lontra
- **November 30, 2023:** Vacuum System Efficiency – *Presenter Andy Smiltneek, President, Growth Solutions Consultants*
Sponsored by Rogers Machinery



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2023 MEDIA PARTNERS



Blower & Vacuum Industry News

Busch Vacuum Solutions US Acquires Vac-Tech Inc.

Busch Vacuum Solutions in the United States is pleased to announce the acquisition of Vac-Tech Inc., a vacuum pump service and sales provider for precision high vacuum pumps in the semiconductor, electronics, and solar markets. Vac-Tech has two locations, one in Phoenix, AZ, and the other in Richardson, TX. This initiative expands Busch's nationwide presence by adding complementary high vacuum service to its overhaul, repair, and installation processes closer to customers in the Western region.

"We are very excited about this acquisition," said Busch US President, Turgay Ozan. "Vac-Tech has been a trusted service and sales provider for many years and bringing their team of vacuum experts under the Busch company provides even more value to our customers."

The new Vac-Tech service locations offer vacuum pump repairs, component replacements, valve rebuilds, parts cleaning, and used vacuum equipment sales.

According to Busch US Vice President of Medium High Vacuum Sales, Mark Magill, "Vac-Tech joining Busch demonstrates our commitment to our customers through every step of the after sales process from start to finish. Busch is dedicated to helping customers get their pumps serviced quickly while ensuring exceptional quality workmanship."

For more information about Busch Vacuum Solutions expanded service offerings and products, please visit www.buschusa.com or call 1-800-USA-PUMP (872-7867).

About Busch Vacuum Solutions

Busch Vacuum Solutions offers vacuum and pressure solutions from individual vacuum pumps, blowers, and compressors to tailor-made vacuum systems. In addition to vacuum equipment, Busch is also a global service provider. Busch USA headquarters is in Virginia Beach, VA, and part of the global Busch family-owned company with over 3,800 employees in 45 countries. For more information, please contact Busch at info@buschusa.com or visit the Busch US website at www.buschusa.com.

Chart Industries Completes Acquisition of Howden

Chart Industries, Inc., a global leader in engineering and manufacturing of process technology and equipment for industrial gas, specialty and energy transition markets, has completed its acquisition of Howden, a leading global provider of mission critical air and gas handling products and services, from affiliates of KPS Capital Partners, LP ("KPS").

The strategic combination of Chart and Howden expands their offering of products and solutions across the Nexus of Clean™ – clean power, clean water, clean food and clean industrials. The combination also provides access to new specialty products and ESG-linked end markets such as nuclear, energy recovery and electrification. The complementary nature of the equipment and solution portfolios results in a differentiated offering across stationary and rotating equipment and is further differentiated by the additional 750 Howden engineers coming with the acquisition, doubling their global engineering team to over 1,500.



Busch Vacuum Solutions acquired Vac-Tech Inc., a vacuum pump service and sales provider for precision high vacuum pumps in the semiconductor, electronics, and solar markets.

Blower & Vacuum Industry News

“We are excited to welcome the Howden team to the Chart family and look forward to the combined business executing on record momentum and well-defined synergies. Since we announced the combination in November 2022, Chart has received numerous inbound inquiries from customers that see the combined benefits we can offer,” said Jill Evanko, CEO and President of Chart.

Through the acquisition of Howden, Chart has gained immediate access to new customers and commercial opportunities, increasing their geographic footprint to over 35 countries. This geographic footprint allows for increased commercial and manufacturing capabilities as well as the ability to bid on projects regionally that were not previously accessible.

Aftermarket, service and repair will represent approximately 30% of the combined organization with approximately 42% gross margin as a percent of sales. The increased global reach, coupled with two large existing

installed bases, will result in less business cyclicity. They will also leverage Howden’s digital offering of Howden Uptime and Ventsim™ across their global installed base.

The new Chart executive management team will include a balance of Chart and legacy Howden executives. They will continue to operate under their “One Chart” commercial and engineering structures, further allowing them to leverage their full solution set across their diverse end markets.

About Howden

Originally founded by James Howden in Scotland as a marine engineering firm in 1854, Howden has grown and evolved into a global leader in manufacturing air and gas handling solutions. With the power of engineering expertise and technology, their equipment plays an integral role within customers’ processes, which provide safe and reliable solutions that are both sustainable and efficient. For more information, visit www.howden.com.

Atlas Copco Acquires James E. Watson & Co.

Atlas Copco has acquired the assets of James E. Watson & Co. The company is a distributor of vacuum equipment and service solutions. James E. Watson & Co. is based in Marietta near Atlanta, Georgia, and provides vacuum consultancy, vacuum equipment sales and service to process industries, including production of chemicals and paper, wood working and food packaging. The business has 7 employees and is present throughout the South-East region of the USA, serving mainly Alabama, Georgia and Tennessee states.

“This acquisition will complement our existing footprint in the region,” said Geert Follens, Business Area President Vacuum Technique.

“The company has a strong reputation and is serving diverse industrial markets with vacuum equipment and service solutions.”

The purchase price is not disclosed. The acquired business will become part of the Industrial Vacuum Division within the Vacuum Technique Business Area.

About Atlas Copco Group

Great ideas accelerate innovation. At Atlas Copco we have been turning industrial ideas into business-critical benefits since 1873. By listening to our customers and knowing their needs, we deliver value and innovate with the future in mind. In 2022, Atlas Copco Group had revenues of BSEK 141 and at year end about 49 000 employees. For more information, visit: www.atlascopcogroup.com.



Chart Industries, Inc. has completed its acquisition of Howden from affiliates of KPS Capital Partners, LP.

Pfeiffer Vacuum to Invest €75 Million in its Anancy Location

In mid-May, Pfeiffer Vacuum Technology AG, one of the world's leading suppliers of vacuum technology, announced a seven-year, €75 million investment plan for its Anancy site at the "Choose France" summit for foreign investors.

CEO Dr. Britta Giesen had the honor of attending the "Choose France 2023" summit in Versailles on May 15 at the invitation of French President Emmanuel Macron. The international investor meeting brings together hundreds of executives from major international companies every year. The goal of this summit is to stimulate international investment in France.



Pfeiffer Vacuum location in Anancy.

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Blower & Vacuum Industry News

“Our investment plan will serve to modernize and digitalize our production in order to continue our growth. We want to double the operations of our French subsidiary with a sales target of €600 million by 2030 and create 100 to 150 additional jobs,” said Dr. Britta Giesen, CEO of Pfeiffer Vacuum.

During the same period, the Group intends to accelerate its course to reduce its CO₂ emissions in Scope 1 and 2 to net zero by 2030. “Reducing our CO₂ emissions should also motivate employees, suppliers and customers to develop innovative solutions for environmentally friendly technologies,” said Dr. Giesen.

Pfeiffer Vacuum’s location in Annecy has the advantage that most of its employees live nearby. “This allows us to reduce commuting and encourage the use of public transportation. Today, 20% of our employees already come to work on foot or by bicycle. It’s excellent that even some no longer own a car,” said Guillaume Kreziak, the managing director of Pfeiffer Vacuum SAS, the group’s French subsidiary.

About Pfeiffer Vacuum

Pfeiffer Vacuum is one of the world's leading providers of vacuum solutions. In addition to a full range of hybrid and magnetically levitated

turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems. Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products in the analytical, industrial, research & development, semiconductor and future technologies markets. Founded in 1890, Pfeiffer Vacuum is active throughout the world today. The company employs a workforce of some 4,000 people and has more than 20 sales and service companies as well as 10 manufacturing sites worldwide. For more information, please visit www.pfeiffer-vacuum.com.

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Piab Group Acquires COVAL

Piab Group has acquired COVAL, a major global player in vacuum automation components and systems. With more than 35 years of history, COVAL adds a solid portfolio of premium products, highly experienced and skilled employees, a strong brand known for the highest quality standards, and many new customers to Piab Group. Through the acquisition, Piab Group is evolving automation by strengthening its position as a world-leading automation company. The transaction is fully funded through a combination of external and internal sources.

“We are very much looking forward to bringing the COVAL team into the Piab family and we see a great culture fit rooted in a strong passion for the future of robotics and automation. With this strategic move, we are confident in our ability to provide our customers with cutting-edge automation solutions, while strengthening our competitive advantage in the market,” said Peter Laurin, CEO of Piab Group.

“COVAL has a perfect strategic fit for our business. The market for industrial automation is growing rapidly and we foresee very strong growth opportunities with the



COVAL joins the Piab Group.

Setting the standard since 1854

Howden, a Chart Industries Company, manufactures the world-renowned Roots™ rotary positive displacement blowers and single- and multi-stage centrifugal compressors in Connersville, IN and Windsor, CT.

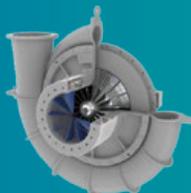
Designed and fabricated to unique applications within a wide array of industries including pneumatic conveying, gas separation, wastewater treatment, steam compression, and petrochemical production. Maintain optimized production levels with Howden factory maintenance and repair services available worldwide.



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RGS-J Gas Compressor



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Blower & Vacuum Industry News

addition of COVAL's competitive portfolio and highly skilled employees, whom I would like to take the opportunity to welcome to Piab Group," said Gustav Falconer, President Vacuum Automation Division.

"Piab Group's long history of innovation in vacuum technology and global presence will allow for COVAL to further develop and provide a long-term home for our family business and its employees. By joining the Piab Group, COVAL joins an excellent global company, a leading innovator in the vacuum technology market and together we will strengthen our leading position in the automation industry," said Michel Cecchin, Owner and CEO of COVAL.

About Piab Group

Piab is evolving automation through progressive gripping, lifting, and moving solutions since 1951. Piab believes in an automated world where no resources are wasted, and no humans are injured. Piab is a global organization, with sales of c. 2.5 BSEK, more than 1,000 employees and 4 divisions, serving customers in more than 100 countries from a network of subsidiaries and channel partners. For more information, visit www.piab.com.

About COVAL

COVAL's mission is to provide its customers and users with vacuum handling solutions that meet their profitability, productivity, quality, safety, and environmental protection objectives. COVAL designs, manufactures, and markets components and systems for vacuum handling for the main industrial sectors: packaging, automotive, plastics, and aeronautics. Its range of vacuum cups, pumps, and grippers contribute to the vacuum handling of all types of objects, of all sizes and materials for better safety and productivity. With a turnover of 23 million euros, 135 employees, and a presence in 60 countries, COVAL is the French leader and a major player in vacuum handling worldwide. For more information, visit www.coval-inc.com.

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Lontra Engineer Joins ASME PTC 13 Committee

The American Society of Mechanical Engineers (ASME), a world-renowned and recognized standards organization, has appointed Lucy Littlewood, Senior Principal Development Engineer at Lontra, as a committee member for ASME Performance Test Code (PTC) 13, the test code providing robust technology-neutral performance test specifications for blowers. Littlewood joins the committee as an adviser/member to ensure the highest level of technical integrity to the code.

Littlewood has over 25 years of experience in mechanical development and precision performance testing, making her a valuable asset to the committee. She has worked with Lontra's innovative compressor technology since 2017, and previously held leadership positions at Alstom and GE, leading multinational teams in testing for steam turbine blading.

"It is great to join the committee at such a pinnacle time, just as the code is undergoing review," said Littlewood, "PTC 13 is a key standard for allowing machines to be reliably benchmarked and I am excited to be able to contribute to further improving it. Energy efficiency has long been an interest of mine, and even more so now in the light of climate change. Blowers are a key portion of industrial energy usage and PTC 13 makes sure that users have the tools to verify that the machines they buy meet promised performance levels. It is a privilege to collaborate with committee members who



Lucy Littlewood joins the ASME PTC 13 committee.

created the code from scratch, making a fundamental impact on the blower industry."

ASME PTC 13 was released in 2018 and is rapidly gaining acceptance as a benchmark for blower specifications. ASME PTC technical guidelines instill confidence by providing uniform rules and procedures for performance testing.

Most importantly, the code helps end users decide which blower technology is right for their application, providing guidelines to forecast blower performance and cost of operations.

Clive Hudson, Engineering Director at Lontra, said, "Lucy's expertise and passion will make her a valuable addition to the committee, and I look forward to seeing her knowledge and hard work come to fruition in the years to come. Overall, the addition of Lucy to the

committee will only strengthen ASME PTC 13's technical standards and further cement its position as a trusted authority in blower performance testing."

About Lontra

Lontra is a developer, manufacturer and exporter of a revolutionary blower and compressor technology, with applications in the wastewater treatment and pneumatic conveying industries. Lontra Blade Blower™ technology is the first clean-sheet blower and compressor design in over 85 years and is available as a packaged, plug-and-play blower package with the LP2 Blade Blower. It has proven energy savings of up to 34% against comparable machines thanks to its game-changing technology. Lontra is on the cusp of global scale-up growth, beginning with their new smart factory in Doncaster (UK), which is now on-line and ready to take increasing numbers of orders. For more information, visit www.lontra.co.uk.



Overcoming Aeration Turndown Limitations with Compressed Gas Mixing

By Sarah Elger, P.E., Director of Strategy and Marketing and
John Koch, P.E., Vice President of Technology, EnviroMix Inc.

► Solving Today's Problems with the Future in Mind

The vast majority of wastewater treatment plants (WWTPs) employ a biological treatment step known as activated sludge. The activated sludge process consists of a complex group of suspended growth microorganisms, often referred to as biomass, operated under different environmental conditions within the plant to target specific pollutants. The process has been utilized for more than 100 years,

with thousands of installations demonstrating a robust and proven track record.

When a facility plans for a WWTP, they typically design based on population and industry growth twenty to thirty years into the future. Regulatory requirements often dictate designing the activated sludge process equipment based on future-state influent flow and loading conditions, resulting in decades of constrained, inefficient, and suboptimal operation.

One of the key equipment components serving the activated sludge process is the aeration system which delivers oxygen to the biomass to ensure proper treatment. The aeration system commonly leverages high-volume, low-pressure blowers to provide oxygen by means of atmospheric air to the biomass requiring aerobic conditions. As the largest consumer of energy at a WWTP, it is particularly important for blower and aeration system designs to offer the flexibility to address a wide range

of operating duty points while providing the installed capacity to meet future requirements.

Like many WWTPs, the facility is unable to take trains offline because of high inflow and infiltration which place excessive hydraulic

load on the facility. With restricted turndown capacity, the WWTP must keep all eight trains in operation to accommodate higher flows

Case Study – Problem Statement

A WWTP in Wisconsin operates all eight of their activated sludge process trains year-round, despite having influent flows that are 23% of their 20-year design flow of 13.4 million gallons per day (MGD). In a perfect world, the WWTP would operate only 3-4 trains to properly balance the inventory of biomass with the current influent loading conditions, targeting a food to microorganism (F:M) ratio that supports effective treatment without excess microbes or excessive aeration which can cause process upsets and waste energy.

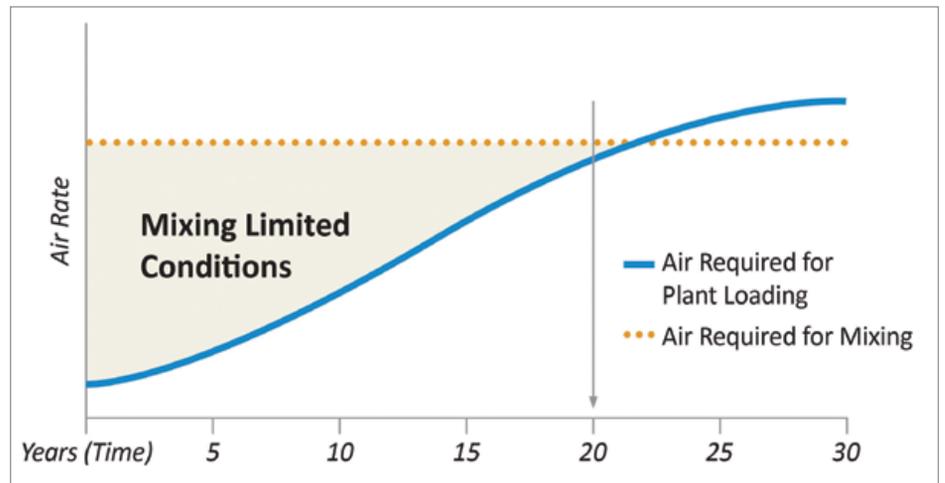


Figure 1: Effects of mixing limited conditions on airflow rate over the life a facility.

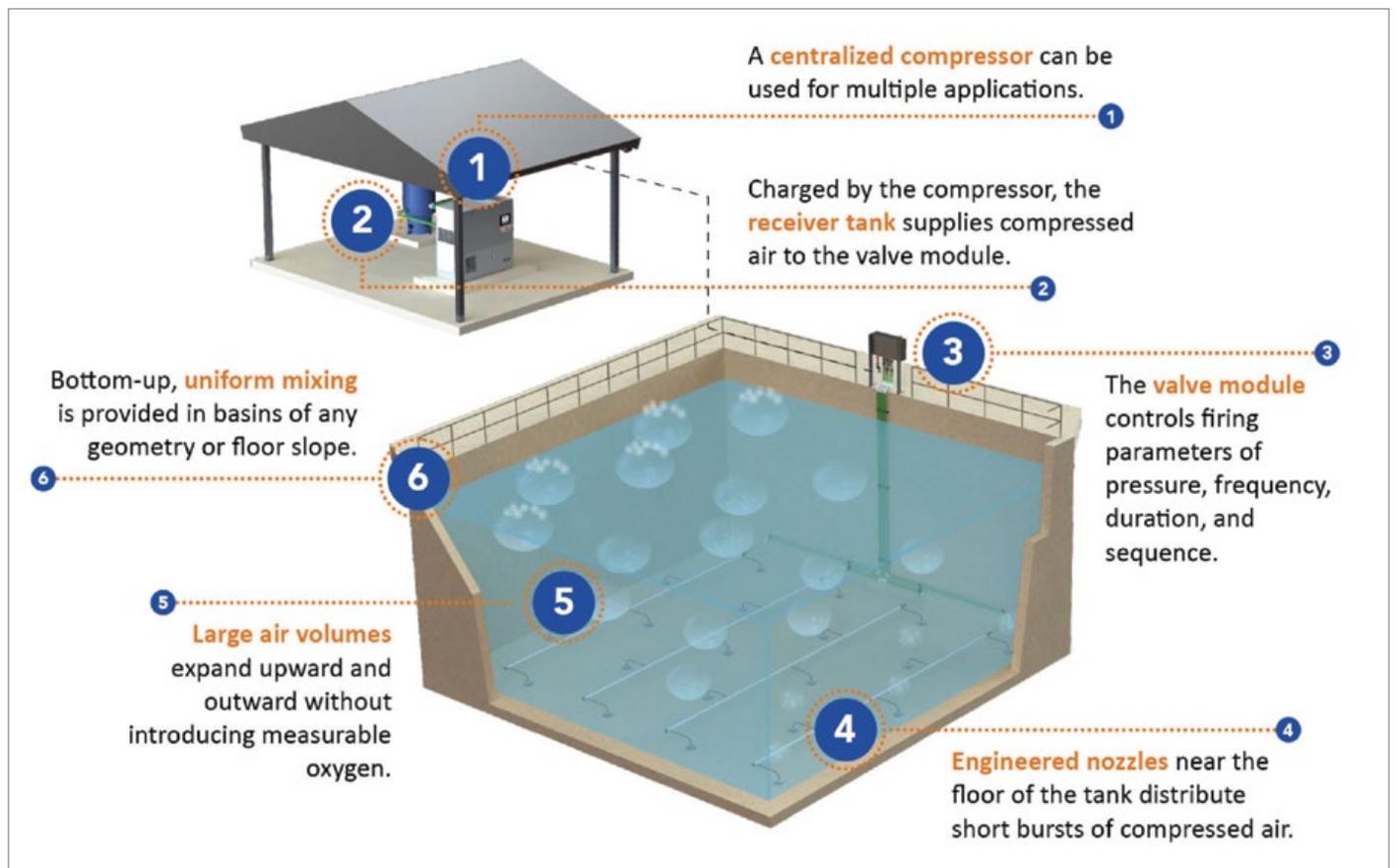


Figure 2: How BioMix Compressed Gas Mixing works

Overcoming Aeration Turndown Limitations with Compressed Gas Mixing

that enter the plant during rain and snow melt events. As a result, the plant operates at a lower mixed liquor suspended solids (MLSS) concentration and struggles to efficiently operate an aeration system that is designed for 13.4 MGD. To exacerbate low loadings further, in the middle of the night, when loading to the plant dips to its lowest flows and concentrations, there is even less airflow required for treatment, making the turndown limitations even more frustrating and wasteful.

The plant evenly distributes airflow between the eight aeration trains, targeting an average of 650 standard cubic feet per minute (scfm)/

train, which is around the minimum airflow required to ensure proper mixing energy to keep the biomass fully suspended. The minimum airflow for mixing is defined as an airflow rate expressed as scfm per square foot (ft²) of surface area of a tank and is oftentimes much lower than the air required to meet the biomass oxygen demand (Figure 1). The industry accepted minimum airflow required for mixing a tank with fine bubble diffused aeration is 0.12 scfm/ft².

The guideline for minimum airflow rate per tank surface area maintains proper mixing to fully suspend the MLSS, eliminating the chance of settled biomass which could compromise

contact between the influent pollutants, oxygen, and biomass. Additionally, inadequate mixing results in solids deposition over time, resulting in added maintenance for tank cleaning and reduced active tank volume which can impact treatment performance.

The ideal aeration system design and operation provides the exact amount of oxygen demand needed for the biomass to remove pollutants, resulting in reproduction and growth. In an underloaded process train that is operating at mixing limited conditions, the airflow to support proper mixing is more than the airflow required to meet oxygen demands. Operating an aeration system under



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mixing limited conditions results in excessive energy consumption to maintain mixing and surplus oxygen which can negatively impact treatment performance.

A Unique Approach

BioCycle-ENR Activated Sludge Process is a comprehensive secondary treatment solution that includes an automated control system and equipment combination to address wide variations in plant loading conditions while maintaining energy efficient operation and meeting treatment objectives. Utilizing the FlexZone Adaptive Process Volume system, BioCycle-ENR adapts operation for startup conditions and seasonal fluctuations without

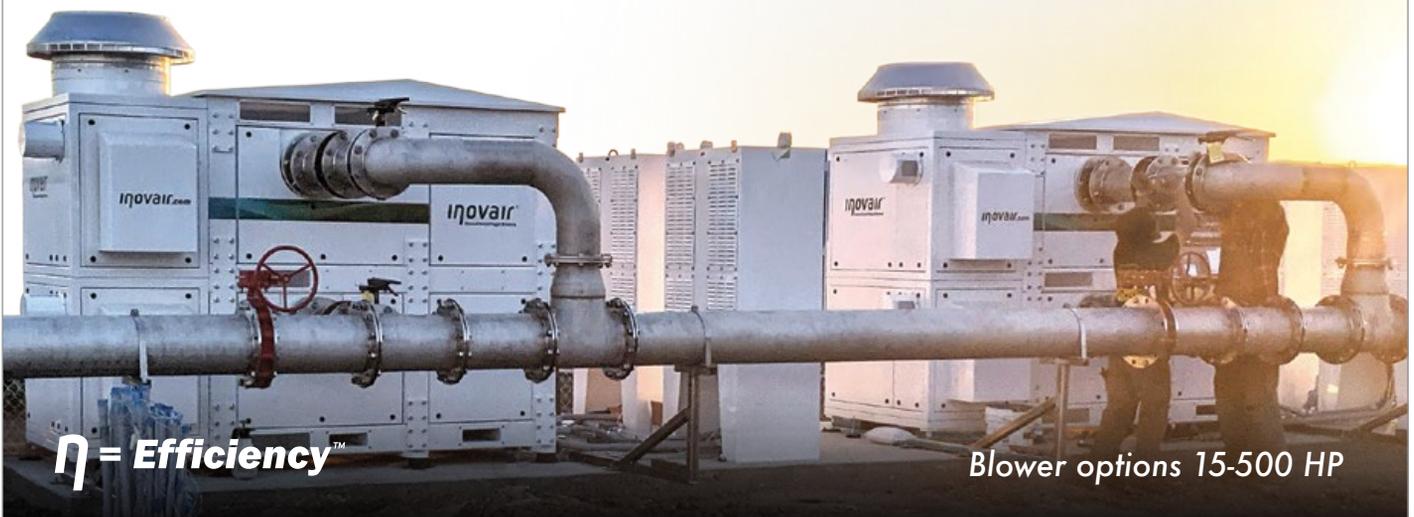
sacrificing treatment capacity to meet future design conditions. Adapting the process to meet current treatment needs allows for the greatest flexibility, providing energy efficiency while meeting current and future treatment requirements. The technology prevents over-aeration and provides active carbon management by transitioning sub-volumes within the aeration tank to different process environments – including, aerobic, anoxic, and low dissolved oxygen (DO) – in real time.

The FlexZone system dynamically matches process volumes to changing influent conditions and allows for unmatched aeration turndown by combining diffused aeration

with compressed gas mixing equipment. Air delivery to satisfy oxygen demand is provided by diffused aeration and process blowers, while BioMix Compressed Gas Mixing provides mixing independent of the aeration system. The integrated system allows independent operation of mixing and aeration equipment – proper mixing is maintained by BioMix, allowing turndown of the aeration system to meet the lowest oxygen demands. Concurrent operation of BioMix and the aeration system, referred to as SyncroMix, highlights the powerful integration of mixing and aeration technologies to satisfy both mixing and oxygen needs in an energy efficient manner under a wide range of operating conditions. SyncroMix

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Overcoming Aeration Turndown Limitations with Compressed Gas Mixing

allows operators to dial in the exact oxygen requirements of the process.

BioMix provides uniform mixing of tank contents by firing programmed, short-duration bursts of compressed air through patented, engineered nozzles located near the tank floor

(Figure 2). A centralized compressor charges the receiver tank, which supplies compressed air to the valve module. The valve module controls the firing parameters, delivering compressed air in short duration bursts through engineered nozzles. Large air volumes expand upward and outward, providing fluid displacement.

Case Study – Solution

The Wisconsin WWTP is evaluating an upgrade to include anaerobic zones for biological phosphorus removal. During the initial planning, it was quickly identified that excess air in the process train was leading to high DO concentrations at the end of the aeration train.

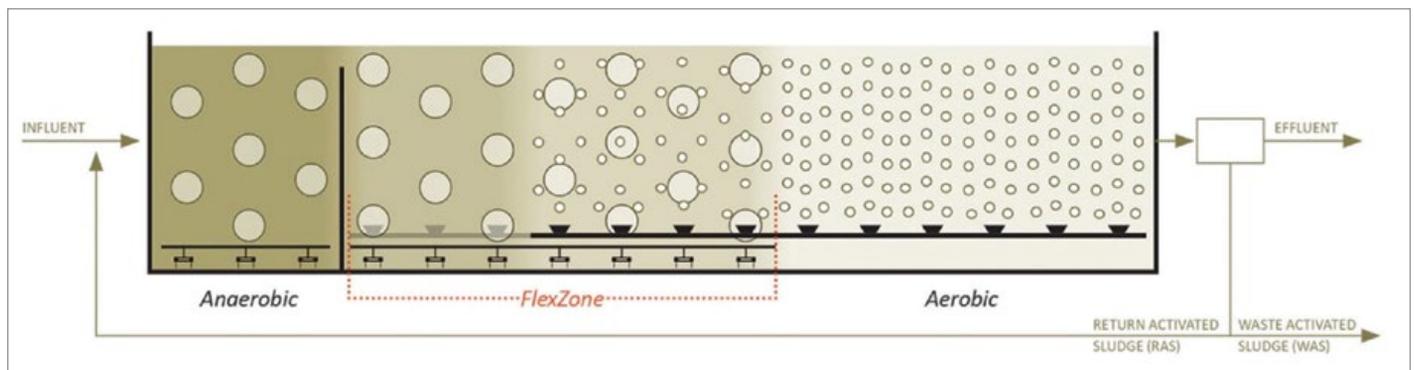


Figure 3: Layout of Modified Treatment Trains #7 and #8

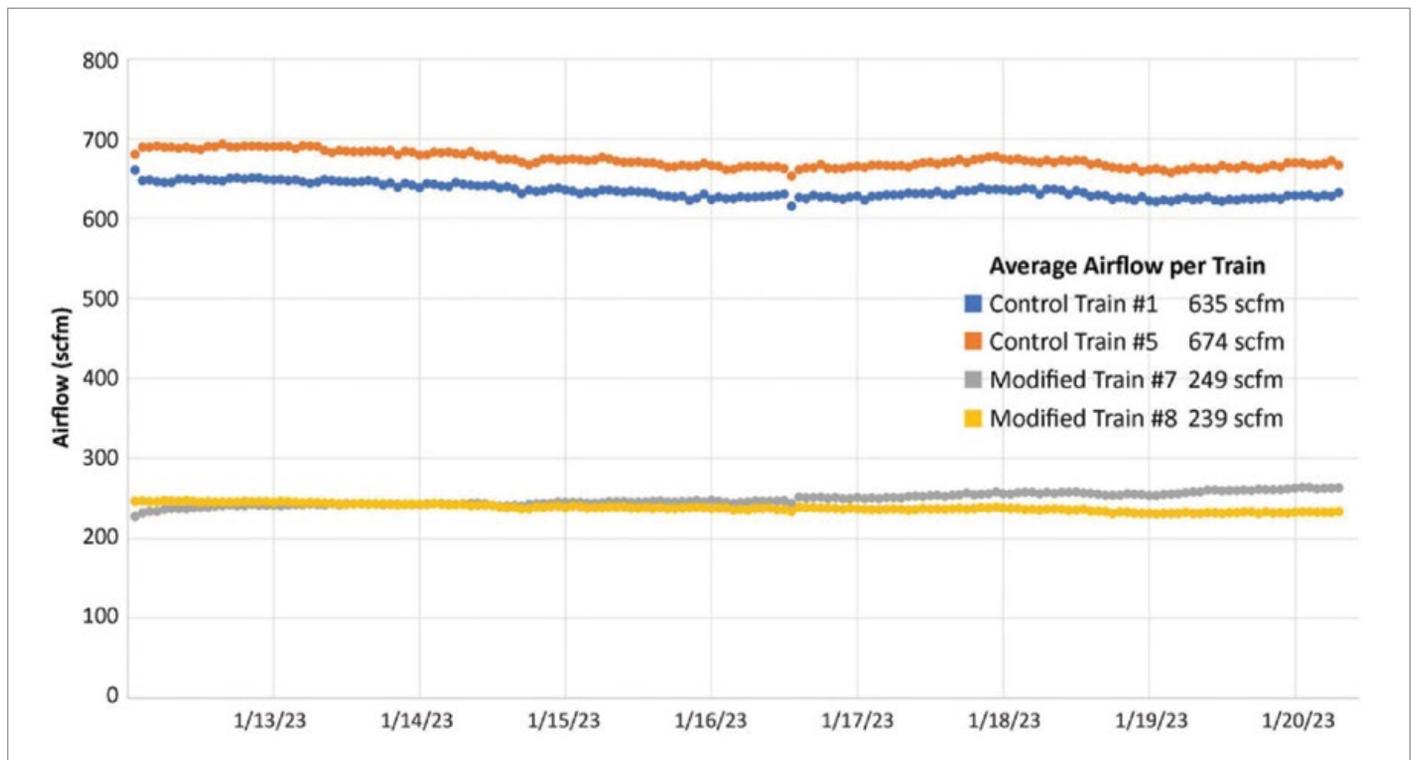


Figure 4: Preliminary difference in airflow rates at a Wisconsin facility

The high DO concentrations not only resulted in wasted energy, but also impacted the biological phosphorus removal performance by introducing oxygen and nitrates to the anaerobic zone through the return activated sludge (RAS) stream.

To reduce nitrates and oxygen in the RAS, the facility installed a FlexZone system in trains #7 and #8 in a portion of the reactor between the anaerobic zone and the aerobic zone (Figure 3). A BioMix mixing system was integrated with the existing aeration equipment to create a FlexZone volume within the treatment train. The process configuration established multiple environments within the existing aeration tank. It allows a large portion of the tank to operate as a flexible zone, providing aerobic or low DO environments for both nutrient removal and improved aeration control to limit recycle of DO and nitrate to the anaerobic zone. The FlexZone allows for substantial aeration turndown because the mixing needs are independently satisfied by compressed gas mixing rather than the aeration equipment.

The adaptive process volume system was combined with a discrete inline anaerobic fermentation zone to better utilize the influent slowly and readily biodegradable carbon (sbCOD and rbCOD) to promote biological phosphorus removal. The anaerobic zone with inline fermentation produces rbCOD to unlock greater potential for enhanced biological phosphorus removal (EBPR) and significantly reduce chemical addition and mixing energy consumption. The final portion of the aeration tank remains a fixed aerobic zone to ensure complete nitrification and organic removal.

The unmatched aeration turndown allows the flexible zone to be operated in a low DO environment which encourages simultaneous nitrification and denitrification (SNDN), resulting in improved aeration efficiency and EBPR. Purposefully placing the FlexZone towards the influent end of the reactor encourages efficient carbon utilization for the SNDN process as carbon is needed for denitrification. The low DO environment and SNDN process reduce nitrates in the reactor, resulting in lower nitrate concentrations in the RAS stream recycled to the anaerobic zone.

Additionally, since the oxygen demand is reduced by SNDN in the FlexZone portion of the reactor, the aeration requirement for the entire

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reactor has been reduced by almost 40%. The airflow in control trains #1 and #5 averaged 635 scfm and 674 scfm, respectively. Whereas the airflow over a one-week period in test trains #7 and #8 averaged 249 scfm and 239 scfm, respectively (Figure 4). Enabling lower airflow without sacrificing mixing promotes SNDN and reduces DO concentrations at the end of the reactor, resulting in lower DO nitrate concentrations in the RAS stream to protect the anaerobic zone and promote EBPR.

The Wisconsin WWTP continues to make modifications and improvements to the modified treatment trains to optimize their biological phosphorus removal and eliminate costly chemicals currently used for phosphorus removal in the control trains. As the plant considers modifying the remaining six process trains, the blower system must be evaluated to confirm that the available turndown capacity will meet current and future process demands.

Considerations for Other Plants

To support the ability for plants to transition aerobic, anoxic, and low DO environments in real-time, blower manufacturers are engaged in the blower selection process early to ensure there is adequate capacity for future demands but also sufficient turndown to match today's demands. The latest strategy is combining multiple blower sizes into a single package, instead of simply multiple blowers of the same size and horsepower (HP). For example, let's say

total blower capacity of 600 HP is required to meet the aeration needs for the 20-year design of a treatment plant. Instead of supplying two 300 HP blowers to meet the 600 HP total blower capacity, it would be more flexible to supply two 100 HP blowers plus two 200 HP blowers, thus providing more granular turndown capacity. The operational savings of running one blower at startup will quickly pay back the capital expense of additional blower packages equaling the same total installed horsepower.

In summary, it is important for plants to consider how:

1. Embedded carbon and fermentation can be used as a resource to minimize chemical addition and provide more effective nutrient removal while reducing the overall oxygen demand.
2. An adaptive process volume provides a wide range of operational flexibility to efficiently address changing demands throughout the life of the treatment facility.
3. Careful consideration of the aeration system and blower design are important to ensure optimal operation for all conditions including startup loading, diurnal loading, and the ultimate 20-year design loading. **BP**

About the Authors

Sarah Elger, P.E. is the director of strategy and marketing at EnviroMix Inc. She has been in the water and wastewater industry for more than 15 years and specializes in biological wastewater treatment and process controls. Sarah received her B.S. in engineering mechanics from University of Wisconsin; received her M.S. in environmental engineering from Milwaukee School of Engineering; and is a registered professional engineer in the State of Wisconsin.

John Koch, P.E. is currently the vice president of technology at EnviroMix, Inc. He received his B.S. in civil engineering from Marquette University. John has more than 30 years of experience in the wastewater treatment industry, specializing in biological wastewater treatment systems including sequencing batch reactors, membrane bioreactors, membrane aerated biofilm reactors, oxidation ditches, and conventional activated sludge systems. John is an active member of Water Environment Federation and a registered professional engineer in the State of Illinois.

About EnviroMix

With offices in Charleston, SC, and Grafton, WI, EnviroMix designs and manufactures treatment technologies which protect the environment and reduce energy consumption in the water and wastewater industry. Utilizing patented and proprietary technology, we provide mixing and process control solutions to enhance plant performance for a wide variety of applications in the treatment process. Visit www.enviro-mix.com for more information.

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Show Report: Pneumatic Conveying at the 2023 Powder Show

By Kimberly Hill, Sustainability Events & Operations
Manager, Blower & Vacuum Best Practices Magazine

► The 2023 International Powder and Bulk Solids Conference and Exhibition (also known as the Powder Show) took place April 25-27, 2023 at the Donald E. Stephens Convention Center in Rosemont, Illinois. The event, sponsored by the Process Equipment Manufacturers' Association (PEMA[®]) and produced by Informa Markets, is the leading powder and bulk handling and dry processing event in North

America. It attracted more than 3,000 attendees and featured over 30 conference sessions and 350 exhibitors, showcasing bulk material handling equipment from 30 different countries. Blower & Vacuum Best Practices and Compressed Air Best Practices Magazines were among the publications available at the show's entrance.

Pneumatic Conveying Systems and Components

VAC-U-MAX is a manufacturer of custom and pre-engineered pneumatic conveying systems and related equipment used to convey, batch, and weigh powders and bulk solids. Systems enhance safety and productivity in various industries. David Kennedy demonstrated the Signature Series, a vacuum conveying system that is typically used above the process. It can handle up to 3,500 lbs/hour of material and can be configured for standard or sanitary applications. He also showed me a tube hopper vacuum receiver for non-free flowing powders and bulk solids. VAC-U-MAX pneumatic conveying systems are closed, clean, and efficient. They use vacuum to draw material from containers without leaks or spills. He also presented their ColumnLift and mobile vacuum conveying system for lowering equipment and easy cleaning, and their combustible dust industrial vacuum cleaners.

At their booth, Kice Industries from Wichita, Kansas, displayed their bulk handling equipment. Brent McIntosh showed me their Positive Displacement Blowers for pneumatic conveying of dry bulk material. These blowers run cooler and slower than others, reducing noise, slip and heat gain. They have sanitary housings with heavy-duty cast-iron bodies and rotors made by Kice's own foundry in Oklahoma, CFM Corporation. He also introduced me to Kice's Rotary Airlocks, Cyclone

Receivers and Dust Collectors for pneumatic conveying and dust control applications in various industries.

Schenck Process displayed their pneumatic conveyors for dilute and dense phases of conveying. They demonstrated the Low Rate Vacuum (LRV) Receiver, a stainless steel vacuum conveying system that can



Brent McIntosh with Kice's Positive Displacement Blower for pneumatic conveying.



David Kennedy, Business Development Manager with the VAC-U-MAX Signature Series.



Mike Oberrieder, Schenck Process LLC and Ryan Krejci, Pesco Inc (left to right) with the Schenck Process MechaTron® feeder.

Show Report: Pneumatic Conveying at the 2023 Powder Show

transfer up to 5,000 lbs./hr of material from various sources to feeders or downstream processes. It has filters and valves and can work with a Schenck Process controller. They also showed me the MechaTron® feeder, a versatile

and easy to maintain feeder for volumetric or gravimetric feeding of various dry materials. It has multiple configurations, feed rates, agitation methods and control options for any process application.

Coperion and Coperion K-Tron showcased their pneumatic conveying products. I got to see their Traveling Equipment Display (TED), a bus with multiple display units and demonstrations. I also checked out the ZXD Rotary Valve, a



Fabian Siffert, Coperion with the original ProRate™ PLUS feeder (photo courtesy of Coperion).



Julie Whitten, Division Manager with the piFLOW® Batch Volume Optimization series.



William Shrewsbury with SMC's new SMARTVENT Type valve for dust collectors.



Mike Doorey, Regional Sales Manager at the WM. W. Meyer & Sons, Inc. booth.

sanitary and easy to clean valve that can feed bulk materials at high capacities and low leakage. They also displayed their ProRate PLUS Continuous Gravimetric Feeder, K3 Vibratory Feeder, KCM-III feeder controller, WYK-CIP two-way diverter valve, Smart Weigh Belt Feeder and 2400 Series Receiver.

Piabs' new piFLOW® Batch Volume Optimization series is a vacuum conveyor that transfers powders, granules and small particles in batches. It uses a sensor to pick up the exact amount of product needed and avoid overpacking. It also releases the product automatically when the conveyor is full.

This makes the transfer process more efficient and reduces energy consumption. The series can handle 7.5 -15 tons/hour of product and offers different options for steel quality and surface finish.

William Shrewsbury introduced me to SMC's new SMARTVENT Type reverse pulse jet valve for dust collectors. This innovative valve system does not require a traditional timer box and can operate up to 32 valves in one system. A single base valve can manage up to 31 remote valves, saving energy and increasing efficiency by adjusting the response time collectively. The valves can clean filters either by timing or on-demand and the pulse sequence can be modified.

WM. W. Meyer & Sons, Inc., from Libertyville, Illinois, displayed multiple products at their booth. Mike Doorey demonstrated their best-selling rotary airlock, the HDX Shaft Mount

Direct Drive Rotary Airlock. This product eliminates side-mounted sprockets and chains, which reduces maintenance and increases efficiency. It is also compact, streamlined, quiet, cost-effective and easy to install.

Another product I saw was a sanitary rotary valve for applications that require inspection or system clean-out of dry raw or finished products. This product can be disassembled, cleaned, and reassembled without tools. They also showcased their Screw Pump for dilute phase pneumatic conveying. This product forms an airtight seal with the conveyed material and has a large material throughput capacity using a low-pressure, high-velocity

air supply. It is a rugged, dust-free alternative to many more fragile styles of pneumatic feeders and can handle 80-100 tons/hour of product.

Blower and Vacuum Packages for Pneumatic Conveying

Howden, the home of the original Roots blower, was recently acquired by Chart Industries. The company has been manufacturing its blowers in Connorsville, Indiana since 1854. Eric Oberhaus showed me their positive displacement product line, which offers flows from 10 cfm to 30,000 cfm. They also have the Root's centrifugal line offering



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flows exceeding 400,000 CFM. The URAI and RAM Series were on display. The URAI series is compact, sturdy, and reliable. The RAM series is versatile, durable, and efficient. They

can create vacuum or pressure and provide both with one unit. The URAI and RAM line have cylindrical roller bearings and splash lubrication for long bearing life.

Aerzen displayed three products at the show. Evan Rutenbar and Joel Schomo demonstrated their PD Packaged Delta Blower, which comes with a sound enclosure and an option of



Eric Oberhaus, Regional Sales Manager, showing the Howden Rotary PD Blower.



Regional Sales Managers Evan Rutenbar and Joel Schomo (left to right) showing the Aerzen PD Delta Blower.



Roger Blanton, General Manager, Eurus Blower.



Tim Meyer and Yonda Abogunrin (left to right) showing a Hardy Pro-Air custom blower package.

a touch screen HMI or gauges. They also introduced me to their Delta Hybrid, which offers benefits at higher pressures from 9 to 20 psi. Finally, they presented the Aerzen Rental Blower, which provides a turnkey solution, for 50 psig and lower, with a remarkable 24-hour response time.

Eurus Blower is a USA Company belonging to Shandong Zhangqiu Blower Co., Ltd. It produces both bare shaft blowers and blower packages. This year, it has launched two new blowers: the RR & ZR Series Large Rotary Blowers and the VR Series Steam Blower. The RR & ZR Series can deliver pressures up to 14.2 psig and flows up to 44,425 CFM. The VR Series can evaporate up to 16,300 LB/HR of steam and has duplex stainless steel, titanium and special corrosion resistant coatings. The steam blower also offers various seal options.

Hardy Pro-Air Systems & Services manufactures custom blower packages in Antioch, Illinois. Tim Meyer and Yonda Abogunrin showed me their 50-horsepower direct drive blower package, which has a variable frequency drive and a remote HMI. It can deliver pressures up to 15 psi. The HMI can alert the operator when the filter needs to be changed or when the blower is overheating or overpressurized. This custom blower package is mounted inside an optional sound enclosure that can reduce noise by up to 15 decibels.

Solberg is an Itasca, Illinois-based manufacturer of intake filters for blowers. It showcased many new products at its booth, such as filter silencers, vacuum pump filters,

and liquid separators. The 2G Series are filter silencers for PD blowers that reduce noise with a high flow tube and a quiet band. They are modular, customizable, and have options for HEPA food grade filtering and explosion protection. The ST Series are vacuum pump filters that remove liquids and particles from various vacuum applications. They have a cast aluminum head and a clear bucket for easy visual inspection and maintenance. The RST Series are heavy-duty vacuum pump filters that use pressurized air bursts to clean the filter element from extreme dust loads. They are self-cleaning air filters with a see-through design, optional automation, and extended bucket for

easy inspection and maintenance. The STS Series are liquid separators that use a baffle mechanism and air flow changes to separate harmful liquid and large particles from inlet air. They have a float capsule that prevents them from damaging the pump.

Paul Mosher and Shawn Boynton greeted me at the Gardner Denver booth. Gardner Denver has been manufacturing efficient blowers, which they called the heart of pneumatic conveying, in Sedalia, Missouri since 1859. They have the widest range of products under one brand and told me about three products at their booth. The DuroFlow is a straight lobe designed for



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Clint Browning, Joe Thode, Mike DeLise, Carlos Romero, Will Schwerdtmann, Jason Cox, Kevin Dumont, Sean Mellin, Ryan Billings and Bettina Schaub (left to right).



Amanda Tuley, Paul Mosher, Shawn Boynton, and Joe Jorgensen (left to right) at the Gardner Denver booth.



Josh Williams, Regional Sales Manager and Adam Crampton, Director of Sales (left to right) at the MD-Kinney booth.

dusty, abrasive environments. It provides airflow up to 4,300 cfm and pressure up to 15 psig. The RBS is a straight tri-lobe whose rotors offer quiet, efficient operation. It provides airflow up to 14,570 cfm and pressure up to 15 psig. The HeliFlow is a helical tri-lobe with an innovative and revolutionary positive displacement blower design that reduces noise by 4-7 dBA. It provides airflow up to 4,500 cfm and pressure up to 18 psig.

MD-Kinney displayed their M-D Pneumatics products at their booth. Josh Williams and Adam Crampton showed me the CP Series that can be used as a vacuum or blower. It is a bare shafted blower that can be integrated into a system. They are designed to be interchangeable with equivalent sizes of competitive models and are rated up to 15 PSIG discharge pressure or 16" Hg dry vacuum. Their MD compact rotary blower packages are open pressure packages that provide a dependable and economical high-volume air source for many applications, such as pneumatic conveying and wastewater aeration.

For similar articles on [Pneumatic Conveying Technology](https://www.blowervacuumbestpractices.com/technology/conveying), visit <https://www.blowervacuumbestpractices.com/technology/conveying>



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The 2025 International Powder and Bulk Solids Conference and Exhibition will take place from April 29 to May 1 at the Donald E. Stephens Convention Center in Rosemont, Illinois. For more information, visit <https://www.powderandbulkshow.com/en/home.html> **BP**

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JAN 19 **The Minimum 24/7 Compressed Air Performance Metrics to Have**
Presenter Tim Dugan, P.E., President and Principal Engineer, Compression Engineering Corporation – Sponsored by VPIInstruments and FS-Curtis/FS-Elliott
Thursday, January 19, 2023 – 2:00PM EST

FEB 23 **Low Pressure (15-60 psi) Air Applications: Blower or Air Compressor?**
Presenter Ron Marshall, Chief Auditor, Marshall Compressed Air Consulting – Sponsored by Kaishan
Thursday, February 23, 2023 – 2:00PM EST

APR 13 **Oil-Free vs Lubricated Rotary Screw Air Compressors: Pros and Cons**
Presenter Paul Edwards, Principal, Compressed Air Consultants – Sponsored by Kaeser Compressors
Thursday, April 13, 2023 – 2:00PM EST

APR 27 **Compressed Air as a Quality/Safety Manufacturing Process Variable**
Presenter Tom Taranto, Owner, Data Power Services – Sponsored by Kaishan
Thursday, April 27, 2023 – 2:00PM EST

MAY 11 **Vacuum System Fundamentals: Depth of Vacuum vs. Absolute Pressure**
Presenter Andy Smiltneek, President, Growth Solutions Consultants – Sponsored by Rogers Machinery
Thursday, May 11, 2023 – 2:00PM EST

MAY 18 **CTI STD-201RS Thermal Certification for Cooling System Heat Rejection Equipment Part 1: Performance Ratings**
Presenter Mike Womack, Thermal Certification Administrator, Cooling Technology Institute – Sponsored by EVAPCO
Thursday, May 18, 2023 – 2:00PM EST

JUN 08 **Vacuum Pump Maintenance**
Presenter Tie Duan, Solutions Engineer, E.W. Klein & Co. – Sponsored by Kaishan
Thursday, June 8, 2023 – 2:00PM EST

JUN 22 **Greener Compressed Air Systems-Reducing the Environmental Impact**
Presenter Paul Edwards, Principal, Compressed Air Consultants – Sponsored by VPIInstruments and Kaeser Compressors
Thursday, June 22, 2023 – 2:00PM EST

JUL 13 **Design Considerations When Transitioning to Oil-Free Compressed Air Systems**
Presenter Tim Dugan, P.E., President and Principal Engineer, Compression Engineering Corporation – Sponsored by Rogers Machinery and FS-Curtis/FS-Elliott
Thursday, July 13, 2023 – 2:00PM EST

JUL 23 **Engineering Rooms for Aeration Blowers**
Presenter Tom Jenkins, P.E., President, JenTech Inc. – Sponsored by APG-Neuros
Thursday, July 23, 2023 – 2:00PM EST

JUL 27 **From Fresh to Soggy – Quality Monitoring: How Compressed Air Condensate Affects Food Quality**
Presenter Francisco Lara, Manager, Airtec Global LLC – Sponsored by SUTO ITEC
Thursday, July 27, 2023 – 2:00PM EST

AUG 17 **Compressed Air as a Food Ingredient**
Presenter Roderick Smith, Publisher, Compressed Air Best Practices Magazine – Sponsored by Trace Analytics and BEKO Technologies
Thursday, August 17, 2023 – 2:00PM EST

AUG 24 **ASME PTC 13: Efficient Blower, Sustainable Systems**
Presenter Tom Jenkins, P.E., President, JenTech Inc. and John Conover, Business Development Manager, Air Clean USA – Sponsored by Lontra
Thursday, August 24, 2023 – 2:00PM EST

SEP 21 **Information Required to Specify an Air Compressor**
Presenter Loran Circle, Senior Consultant, Circle Training & Consulting – Sponsored by Vaisala
Thursday, September 21, 2023 – 2:00PM EST

OCT 05 **Compressed Air Systems for Cheese Manufacturing**
Presenter Frank Melch, Vice President, Zorn Compressor & Equipment – Sponsored by Quincy Compressor
Thursday, October 5, 2023 – 2:00PM EST

NOV 09 **Chiller Selections for Central Plants: Lowest Overall Costs for Process Cooling**
Presenter Clayton Penhallegon, Jr., P.E., Integrated Services Group – Sponsored by Carrier
Thursday, November 9, 2023 – 2:00PM EST

NOV 30 **Vacuum System Efficiency**
Presenter Andy Smiltneek, President, Growth Solutions Consultants – Sponsored by Rogers Machinery
Thursday, November 30, 2023 – 2:00PM EST

DEC 07 **Compressed Air Dryer Maintenance and Monitoring**
Presenter Loran Circle, Senior Consultant, Circle Training & Consulting – Sponsored by BEKO Technologies
Thursday, December 7, 2023 – 2:00PM EST



Loran Circle
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Blower & Vacuum Technology News

Atlas Copco Expands Range with DB Side Channel Blowers

Atlas Copco, the specialist for high-quality vacuum solutions, is expanding its comprehensive vacuum pump portfolio with the side channel blowers DB series. Based on an efficient operating principle, the vacuum is created by the kinetic energy of the rotating impeller. The impellers are connected to the motor shaft and enable suction of the pumped medium, which is accelerated in the side channel.

Side channel blowers are designed for applications where high flow rates are required. This makes the dry rough vacuum of the DB models suitable for rough industrial processes - such as drying, pneumatic conveying or suction processes. The modular design ensures high efficiency, reliable performance and quiet operation.

Thanks to the dry, non-contact pumping principle, the exhaust air of the DB vacuum pumps cannot be contaminated; the vacuum is completely free of oil and dust, without any emissions or impurities. The models are equipped as standard with IE3 motors in eco-design and comply with cURus standards. This certification meets all safety requirements for the Canadian and American markets.

Depending on the required vacuum performance, Atlas Copco offers the DB series in single-stage and two-stage versions, optionally with one impeller or twin impellers each. The single-stage version releases the pumped medium after it has gone through just one stage, while in the two-stage version it enters the second stage after the first one. Operation with twin impellers increases the blower's capacity. The two-stage version 2 (4) achieves a higher vacuum level.

The combination of both results in larger air flows and higher vacuum levels with just one machine.

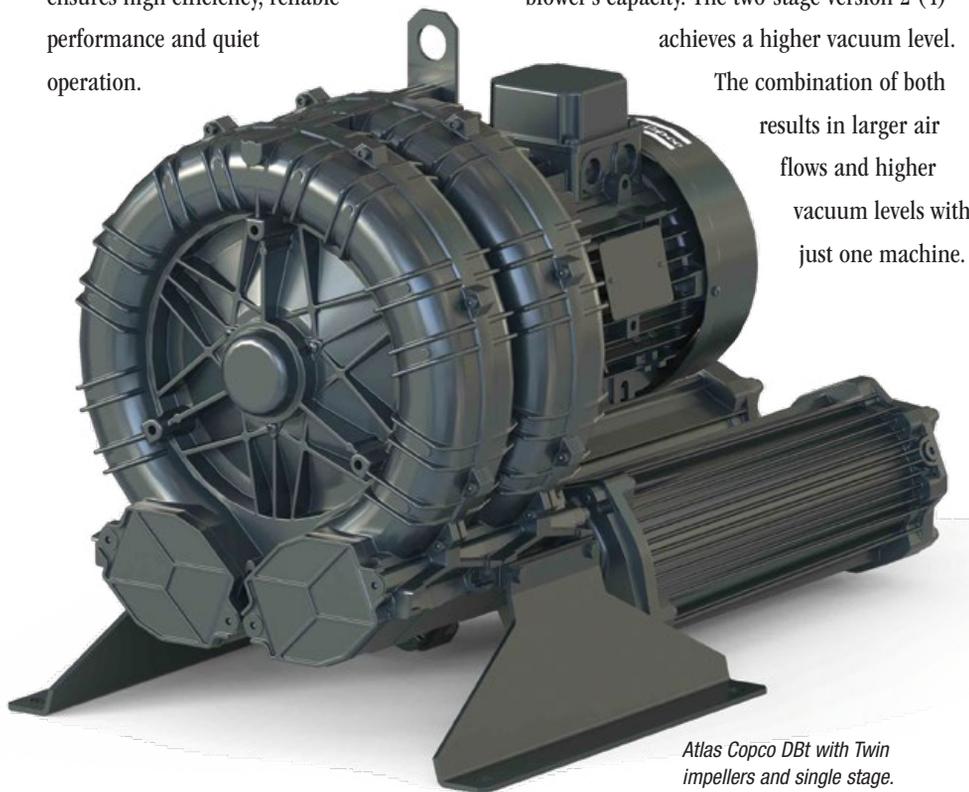
Atlas Copco takes care of maintenance planning and regular servicing of the DB pumps, if required. "Our 'Preventive Care Plan' is tailored exactly to the pump's needs. Since the vacuum pumps are maintained using state-of-the-art technologies, we also achieve a high level of energy efficiency as a result," Carol Pignatelli, the responsible product manager at Atlas Copco, said. Thus, regular maintenance ultimately helps to reduce operating costs and increase process productivity by minimizing unplanned downtime.

About Atlas Copco Industrial Vacuum

At Atlas Copco Industrial Vacuum we have revolutionized vacuum technology. Our state-of-the-art vacuum pumps and systems exemplify today's connected and digitalized industry. Our teams of exceptional and passionate people engineer customer-centric vacuum solutions that offer better energy efficiency, consumer safety, improved productivity and a sustainable future. Our products are the invisible force that drives all industrial applications and manufacturing, and our division includes the Atlas Copco, Edwards and Leybold brands. We are headquartered in Cologne, Germany with production centers in Germany, France, Belgium, Czech Republic, the United States and China. For more information, visit www.atlascopco.com.

Lontra Introduces LP2 Blade Blower

Lontra is pleased to introduce the LP2 Blade Blower. The LP2 Blade Blower is ideal for a variety of low-pressure industrial applications, from 4 psi, up to 15 psi, and potentially higher with consultation from Lontra. The airend is oil-free and ideal in clarification and aeration processes within a sewage or wastewater



Atlas Copco DBt with Twin impellers and single stage.

treatment plant, pneumatic conveying, food and beverage, as well as pharmaceuticals, to safeguard end product quality. Intensive testing and analysis have demonstrated results of more than 80,000 operating hours without the need for repairs.

Lontra's low-pressure LP2 Blade Blower is robustly designed for high performance and continuous operation, even in extreme and challenging conditions, ensuring a consistent supply of compressed air.

The positive displacement Blade Compressor® technology's unique geometry results in a unit that is more reliable, energy-efficient, and inherently oil-free. It offers low leakage and inlet/outlet flow losses, with independent testing demonstrating energy savings of up to 34% to reduce energy costs, which can also aid end-users to meet 2030 net zero emission targets.

Lontra teamed-up with Yaskawa, a global leader in robotics and automation, to incorporate a variable speed drive (VSD) inverter, used to control the rotation speed and torque of Lontra's WEG IE5 ultra-premium permanent magnet motor. Designed together with globally renowned motor specialists, WEG, this custom-designed motor is mounted directly onto the compressor shaft, with no coupling, to reduce losses and further increase efficiency at all operating points.

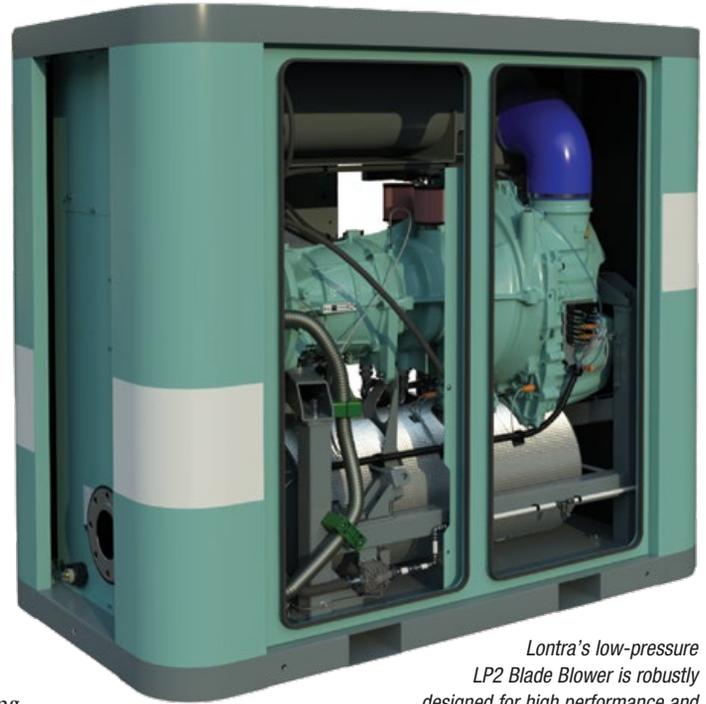
Utilizing the expertise of a prominent leader in seals and bearings, SKF, to engineer the custom rolling element bearings employed within our Blade Compressor® geometry. They delivered

highly efficient solutions that delivered several proven performance benefits, optimal service life, high load-carrying capacity, low operating temperatures, and exceptionally low vibration and noise levels.

All these key components are consolidated within the unique, sound-attenuating enclosure jointly designed with Universal Wolf, market leaders in complex metal fabrication. Custom-engineered to be strong and minimize moisture ingress and contamination.

Smart performance monitoring and machine learning, provide early warnings for repairs and maintenance. Lontra's technological advancements reduce operational downtime, maintenance costs, and total ownership costs - reducing the risk of costly and disruptive operational downtime, increasing productivity, and providing peace of mind.

Conveniently operated through its plug-in touchscreen, the technology measures and tracks pressures, temperatures, vibration, essential lubricants, and coolant levels in real-time. This increases the LP2 Blade Blowers lifetime performance and provides data for operational risks and improvements for the unit and its components.



Lontra's low-pressure LP2 Blade Blower is robustly designed for high performance and continuous operation.

The LP2 Blade Blower is the first commercially available blower redesign in 85 years that resolves many problems associated with conventional blower design.

About Lontra

Lontra is a developer, manufacturer and exporter of a revolutionary blower and compressor technology with application to the wastewater treatment and pneumatic conveying industries. Lontra Blade Blower™ technology is the first clean-sheet blower and compressor design in over 85 years and used inside the product: LP2 Blade Blower. It has proven energy savings of up to 34 percent against comparable machines of this type thanks to the game-changing technology. Lontra is on the cusp of global scale-up growth. Production at their new smart factory in Doncaster, UK, is ready to take an increased number of orders, as they continue to build a strategic supply chain that it can partner with into the future. To learn more visit www.lontra.co.uk.

Blower & Vacuum Technology News

Pfeiffer Vacuum Offers New Pirani/Bayard-Alpert Vacuum Gauge

Many vacuum applications operate only within a specific pressure range. To operate such vacuum systems efficiently, the total pressure must be measured reliably. Therefore, Pfeiffer Vacuum offers a large product portfolio of measurement gauges available both for a digital and analog output signal. The analog vacuum gauges in the ActiveLine have upgraded with a successor model to the PBR 260. The new gauge called PBR 360 covers the range from 5 x 10⁻¹⁰ to 1,000 hPa and is characterized by its high measuring accuracy.

Due to its compact design, the gauge provides a space-saving way to incorporate it in vacuum process systems, analytical instruments, leak detection systems and numerous other applications. Two filaments offer enhanced operating reliability, process control and longevity. Another advantage is the higher accuracy compared to other measuring principles. Existing accessories for the predecessor model can still be used. An attractive

New vacuum gauge from Pfeiffer Vacuum ensures enhanced process control and operational reliability.



service concept with replaceable sensors rounds off the profile of the PBR 360.

“Due to the redundancy of the filaments and the attractive service concept, fewer gauges are required over the same period and can be repaired more often than replaced. This contributes to preventing waste and promoting a sustainable economy,” said product manager Sedrick Njomou.

About Pfeiffer Vacuum

Pfeiffer Vacuum is one of the world's leading providers of vacuum solutions. In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems. Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products in the analytical, industrial, research & development, semiconductor and future technologies markets. Founded in 1890, Pfeiffer Vacuum is active throughout the world today. The company employs a workforce of some 4,000 people and has more than 20 sales and service companies as well as 10 manufacturing sites worldwide. For more information, please visit www.pfeiffer-vacuum.com.

Leybold Develops Multi-VAControl Vacuum Control

In research and industry, it is getting more and more important for users of vacuum systems to be able to control individual pumps and to use their operating data. Vacuum specialist Leybold has developed a controller precisely for this purpose. With the Multi-VAControl, users have a solution to control, monitor and synchronize pumps in central vacuum systems as well as in Roots pump systems. This enables them to comprehensively control the pumps, provide data for quality management and intelligently manage their energy consumption.

Especially against the background of scarce resources and rising prices, customers are increasingly demanding smart control of their vacuum performance. The Multi-VAControl prepares the relevant pump data and meaningful KPIs for these cases. The status of the vacuum pumps, important performance data and the efficiency of the entire system are shown on a display. Additional use-specific functions can be integrated as required. With this data, processes can be monitored, controlled and optimized in real time.

Based on real-time data and programmed warnings, maintenance can also be carried out as needed, eliminating unplanned process and maintenance costs. If approved by the customer, Leybold Service teams access the VAControl remotely and provide rapid support for necessary updates, optimizations and diagnostics. This ultimately ensures maximum uptime and high production quality of the systems.

“Because of this requirement profile, the focus during the development of the Multi-VAControl was primarily on customer benefits and user-friendliness,” explains the product manager Niels Gorrebeeck. For these user benefits, the system records important pump data, such as the pressure values. Then the encrypted data is transmitted to authorised users either locally, via remote connectivity or via cloud. Control can be done directly via various interfaces and devices. With VAControl, the energy consumption of vacuum processes is also continuously recorded and made transparent. To minimize the total energy consumption of a system, the load of the vacuum pumps can be



The Multi-VAControl is suitable for many areas of application such as central vacuum solutions in food processing, packaging, general industry, thermoforming and glass.

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Blower & Vacuum Technology News

regulated by the controller in such a way that pumps are only switched on when necessary and then run at the required minimum power.

Installation and operation of the Leybold controller via the user interface is straightforward and intuitive – the pump manual is stored so that it is always at hand for operators. Subsequent integration of additional pumps into the system is easy and can also be done at any time after commissioning. Moreover, the Multi-VAControl can also be used with pumps and systems from other manufacturers. The bottom line is that its functionality is versatile and oriented towards the needs of modern vacuum systems – all applications and processes from the fields of research & development and industry can be intelligently controlled with it. Customers can use the controller to maximize the efficiency, service life and reliability of their systems while keeping overall life cycle costs low.

About Leybold

Established in 1850, Leybold is a pioneer in vacuum innovation. Our inventions have paved the way for many modern-day vacuum technologies, including our range of next-generation vacuum products. We are recognized globally as a leader in the manufacture of vacuum pumps and systems for industrial and scientific vacuum applications, that are supported by our specialized and globally accessible Service solutions. We are proud to live up to our brand promise - Pioneering products. Passionately applied. Founded in Cologne, Germany with sales and service locations around the globe. We are a part of the Atlas Copco Group. For more information, visit www.leybold.com.

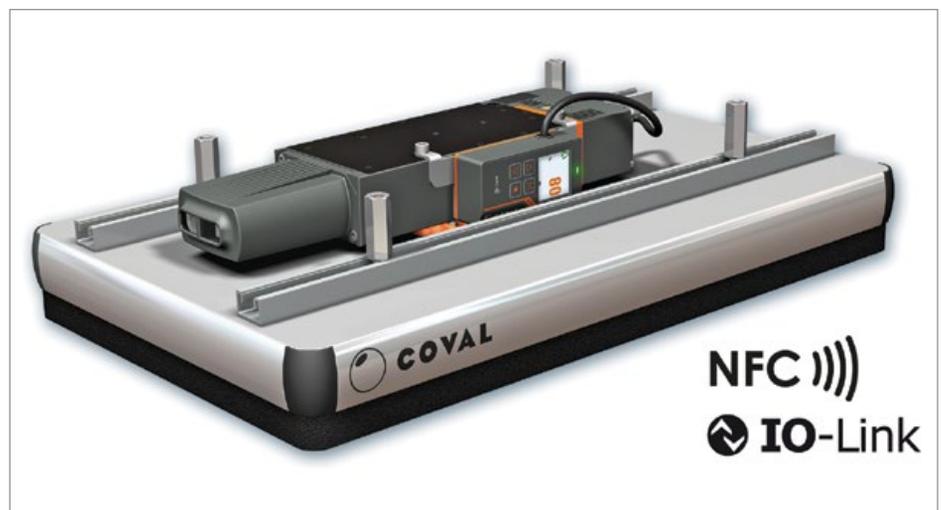
COVAL Extends Vacuum Gripper Range

COVAL offers manufacturers a range of vacuum grippers suitable for handling parts of various sizes, weights, and materials. This gripper range has been extended with the latest CMS HD series multistage vacuum pumps, developed by COVAL. With this enhancement, the new generation of grippers meets the demands of Industry 4.0 with greater robustness, communication, and modularity.

COVAL's range of vacuum grippers is based on two complementary solutions. The CVGL is characterized by its lightness and great adaptability. It is available as standard in several lengths, power ratings, and gripping interfaces. The MVG, on the other hand, offers the possibility of configuring the gripper to allow it to be perfectly adapted to each application by determining the length, width, gripping interface, and vacuum generator while guaranteeing extreme lightness. It offers a tailored solution that integrates perfectly with handling robots.

COVAL's new generation of vacuum grippers now incorporates the latest CMS HD series of vacuum pumps. These pumps have a heavy-duty design for high reliability even in harsh environments (IP65), capable of ensuring 50 million cycles. A factor of the pump's longevity is their modular design which allows specific configurations and targeted maintenance of specific parts to optimize repairability. As a result, the new generation of CMS HD multistage pumps adds to the vacuum grippers' reliability and adaptability.

The new COVAL vacuum grippers offer a choice of three multistage vacuum pump configurations, depending on the needs of the integrator or end user: non-piloted, piloted, and communicating. The communicating configuration, which makes the vacuum grippers easier to use and parameterize, is obtained by integrating the CMS HD VX version of the multistage pump. The VX pump version features an IO-Link communication



New and improved vacuum grippers from COVAL with communications interface.

interface, compliant with the international IEC 61131-9 standard, for fast and cost-effective installation, continuous diagnostics, centralized parameterization, and efficient communication with higher-level protocols (EtherNet/IP, PROFINET, EtherCAT, etc.). It can also support a Human Machine Interface (HMI) with NFC interface, enabling the operator to read and modify setup parameters and diagnostics from a mobile device (Android or iOS) using the dedicated COVAL Vacuum Manager app. With these pump capabilities, the new generation of COVAL vacuum grippers has become even more versatile and perfectly compatible with the robot systems at the heart of Industry 4.0.

Thanks to their great modularity and ease of integration in all contexts, CVGL and MVG vacuum grippers can be found in many industries: packaging, plastic, metal, and wood for handling porous and non-porous objects.

About COVAL

Established in the south of France, COVAL SAS designs, produces and markets high-performance vacuum components and systems throughout the entire world for industrial applications in all lines of business. COVAL is an ISO 9001 V2015 certified company that innovates on a global scale in vacuum handling using optimized components

with integrated, intelligent and reliable features. Its solutions can be adapted to any industrial context and their primary goal is to improve productivity with safety in mind. COVAL's clients are present in all major industrial fields in which vacuum handling is critical for efficiency and productivity. These fields include packaging, automotive, plastic processing, aeronautics, and palletizing. COVAL markets its products and services throughout Europe as well as in North and South America through its subsidiaries and its network of authorized distributors. For more information, visit www.coval-inc.com.

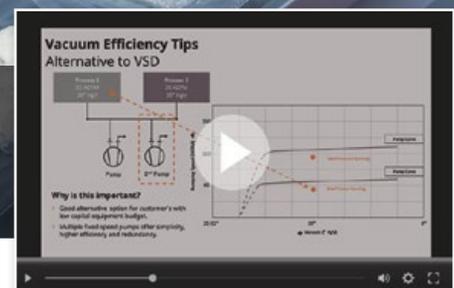
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"Fresh foods such as meat, sausage, fish, and cheese are usually vacuum packaged at a pressure of around five millibars."

— Jasmin Markanic and Uli Merkel, Busch Vacuum Solutions

Aeration Blower Systems

Operators at wastewater treatment plants, process engineers at engineering firms, and municipal sales reps representing blowers receive the magazine. They turn to our editorial pages whose content is directed by noted aeration blower experts. Here they find ideas and advice on calculating/sizing aeration blowers, the latest specification trends from engineering firms and improve their understanding of new Blower Standards like ASME PTC 13.

"The complexity of blower systems, the increasing use of packaged systems, and greater importance of energy use has generated the need for wire-to-air test codes."

— Tom Jenkins, JenTech Inc.

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