

# BLOWER & VACUUM BEST PRACTICES®

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October 2024

## Centralized Vacuum Systems

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\* Based on November 2023 EPA RFI: <https://www.regulations.gov/document/EPA-HQ-OW-2023-0396-0001/comment>

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## INDUSTRIAL VACUUM & BLOWER SYSTEMS

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## AERATION BLOWER SYSTEMS

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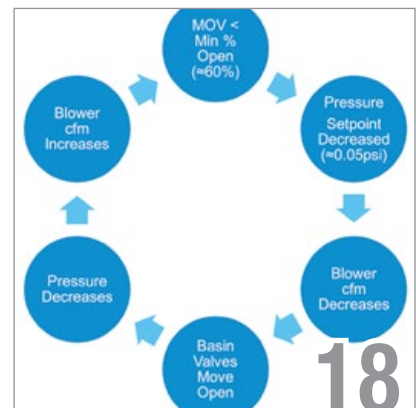
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# From the Editor



Something's different here, you're saying. Yes, I'm the new Senior Editor for *Blower & Vacuum Best Practices Magazine*. Your favorite magazine is growing, and that means a new editorial team behind the scenes. Don't worry, though – Roderick Smith is still the Publisher and checks every word. But now he has a little more time to plan amazing conferences.

## Industrial Vacuum & Blower Systems

Jamie Stebbins of Solberg Manufacturing has delivered a guide that's sure to help many plant managers decide whether a point of use or centralized vacuum filtration system is right for them. Stebbins writes with such clarity that by the time you've read through his points, you'll find you have your answer. It comes down to understanding the contaminants present, the maintenance required and the costs involved.

Vacuum system leaks don't only siphon off your air flow, they also siphon your profits. If you aren't on top of leaks, you'll find you're using more and more energy for the same performance. To get a handle on leaks, follow the seven best practices for leak detection in vacuum systems, created by Sinja W. Stentoft of Busch Vacuum Systems.

By the way, take a look at the October issue of *Compressed Air Best Practices Magazine*, if you have one around, for my report from IWF 2004. I spoke to several companies about the latest vacuum pumps.

## Aeration Blower Systems

Longtime readers know any issue with a feature by Tom Jenkins is a good issue. This time, Jenkins digs into advanced aeration control for blowers, a topic he recently discussed in a *Blower & Vacuum Best Practices* webinar. While not intended to replace dissolved oxygen control systems, the advanced techniques in this article will help enhance accuracy when determining the process demand for air and optimize blower performance.

If you have a story for *Blower & Vacuum Best Practices*, please reach out to me so I can share your best practices in an upcoming issue.

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- July 25, 2024: **Instrumentation and Monitoring for Vacuum Systems** – Presenters Emma Larrabee, Marketing Manager and Todd Dunn, VP Sales & Marketing, Zorn Compressor & Equipment  
Sponsored by Quincy Compressor
- September 12, 2024: **Advanced Blower Sizing and Selection** – Presenter Tom Jenkins, P.E., President, JenTech Inc.  
Sponsored by Kaeser Compressors
- November 21, 2024: **Power Consumption Curves for Vacuum Pumps: Fixed-Speed vs Variable-Speed** – Presenter Andy Smiltneek, President, Growth Solutions Consultants  
Sponsored by Rogers Machinery

## 2024 MEDIA PARTNERS



# Blower & Vacuum Industry News

## Atlas Copco Group's Business Area President for Vacuum Technique to Retire

Geert Follens, Senior Executive Vice President and Business Area President for Vacuum Technique, has decided to retire. He will remain in his position until the end of 2024.

Geert Follens, born 1959, has held the position of Senior Executive Vice President and Business Area President for Vacuum Technique and has been a member of Atlas Copco's Group Management since 2017. He joined the Group in 1995 and has held several positions in purchasing, supply chain and general management before his current role.

"On behalf of the entire Group, I would like to thank Geert for his dedication and long service. He has been a valued member of Group management and an appreciated leader," said Vagner Rego, President and CEO, Atlas Copco Group. "Geert has, during his career, significantly contributed to Atlas Copco Group's success, not least by having a crucial part in the establishment of the Vacuum Technique Business Area, but already before that, Geert's strategic leadership and successful results in global and local management were well established."

The recruitment of a successor to the role will be initiated soon. Geert Follens will remain in his role until the end of December 2024 to ensure an orderly transition.

### About Atlas Copco Vacuum Technique

*Atlas Copco Vacuum Technique collaborates with its customers to turn industrial ideas into leading edge technology in vacuum and abatement solutions. Its passionate people, expertise and service*



*Geert Follens, Senior Executive Vice President and Business Area President for Vacuum Technique*

*bring sustainable value to industries everywhere. It's headquartered in Cologne, Germany, with production centers in Germany, France, Belgium, Czech Republic, the United States and China. For more information, visit <https://www.atlascopco.com>.*

## APG Neuros 1MW Turbo Blower Achieves UL Listing

APG Neuros is pleased to announce its largest blower, the APGN1500, also known as APGN1MW, has achieved UL listing complying to both U.S. and Canadian standards.

The 1MW is the biggest one-of-its-kind turbo blower with one motor that supplies more air with a smaller footprint, higher total wire-to-air efficiency, more flexible control, variable speed/turndown, low maintenance and quiet operation. It has a built-in programmable logic controller for easy operation of the blower.

The 1MW is currently installed and in operation at Metro Water Recovery in Denver, Colorado, as well as City of Las Vegas, Nevada, and Central Contra Costa Sanitary District in California. The 1MW is in production and will

shortly be delivered to the company's customer at City of Wyoming, MI.

### About APG Neuros

*Founded in 2005, APG Neuros was established to distribute, manufacture, provide aftermarket support and continued development of the high-efficiency turbo blowers and complete aeration systems. The company's focused approach drives its successful product introduction and high speed blower technology, and is based on technical excellence, proven design, high quality material and UL & CSA certification. APG Neuros prides itself on driving and inspiring innovation through cutting edge technology, its in-house R&D program and aeration solutions to provide maximum efficiency and operational flexibility for its customers. For more information, visit <https://apg-neuros.com>.*

## CryoDry® Announces Partnership with Pfeiffer Vacuum

CryoDry®, experts and innovators in freeze-drying technology, proudly announced its partnership with Pfeiffer Vacuum, renowned for manufacturing high-quality vacuum pumps.

This significant collaboration highlights CryoDry's commitment to delivering exceptional solutions to the global freeze-drying community. Pfeiffer Vacuum's outstanding reputation as provider of precision-engineered, German-made vacuum pumps boosts the combined efforts between two industry leaders.

With a track record of excellence, Pfeiffer's vacuum pumps offer distinctive advantages of low noise and vibration, high water vapor tolerance, quality and long service intervals, ensuring reliability and efficiency for all freeze-drying applications.

## Blower & Vacuum Industry News

CryoDry is thrilled to introduce its new lineup of Pfeiffer vacuum pumps, available worldwide through the company's extensive network of distributors. CryoDry's vacuum pump lineup includes the following cutting-edge models:

- HiScroll 6 and HiScroll 12 scroll vacuum pumps – These oil-free, quiet and energy efficient pumps are designed to meet the highest performance standards and feature high gas ballast, which is key to good freeze-drying performance.
- Duo 6 rotary vane pump with oil mist eliminator – This advanced pump offers exceptional reliability and functionality with an extensive track record in the freeze-drying industry.

"We are thrilled to embark on this journey with Pfeiffer Vacuum, known for their superior vacuum pump technology. Through this partnership, CryoDry delivers excellent freeze-drying solutions to our esteemed customers," said Paul Fieldhouse, General Manager, CryoDry.

### About CryoDry®

*CryoDry® is dedicated to providing freeze dryer solutions to best meet the needs of its customers. The company understands freeze drying is a critical process for many industries, and its customers rely on it to provide products that are not only of the highest quality, but that are also reliable and efficient. The mission at CryoDry® is to be the leading provider of freeze dryer solutions, and to help its customers succeed in their own endeavors. For more information, visit <https://cryodry.biz>.*

### About Pfeiffer Vacuum

*Founded in 1890, Pfeiffer Vacuum is a global leader in vacuum technology, known for manufacturing high-quality vacuum pumps that meet the demands of various industries. With a legacy of German engineering, Pfeiffer vacuum products are well-known for their precision and reliability in vacuum solutions. 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, visit <https://www.pfeiffer-vacuum.com>.*

### Piab Robotic Gripping Division Relocates to Fairborn, Ohio

Piab's Robotic Gripping Division is excited to announce the relocation of its manufacturing and office operations to 1170 E Dayton Yellow Springs Rd, Fairborn, OH 45324. The move supports Piab's strategic vision for growth and expansion over the next decade and beyond.

The new location, which comprises 14,000 square feet, will provide Piab with significantly more space to expand its operations and enhance its ability to serve customers. This relocation will also provide employees with new amenities and a state-of-the-art work environment.

"We were able to customize the facility layout to fit our specific needs and improve efficiencies. The location is central to our employees and has a great infrastructure to support their needs outside of work," said Tim Thatcher, Operations Manager of Piab USA's Robotic Gripping Division.



*Piab's Robotic Gripping Division is relocating its manufacturing and office operations to Fairborn, Ohio.*

### About Piab

*Piab is evolving automation through progressive gripping, lifting and moving solutions. Since 1951, Piab has been serving industries like e-commerce logistics, food, pharma, automotive and more, improving energy-efficiency, productivity and work environments. With a presence in more than 100 countries, Piab is a global organization dedicated to developing automation solutions that enhance the efficiency and quality of production processes. For more information visit, <https://www.piab.com/en-us>.*

## Veolia North America Unveils Major Upgrades to Richmond Water Pollution Control Plant

Veolia North America, a leading provider of environmental solutions in the U.S. and Canada, unveiled major upgrades to the Richmond Water Pollution Control Plant to the public, showcasing the results of a three-year, \$40 million construction project that will improve wastewater treatment, environmental compliance and odor control for the city of Richmond and nearby communities on San Francisco Bay.

Veolia has operated Richmond's wastewater treatment plant for more than two decades, and the construction project marks a significant step forward in modernizing the plant's ability to effectively treat the city's wastewater and protect its environment.

"Veolia is proud to be a key partner to the city of Richmond as it continually improves its infrastructure and its resiliency for the future," said Karine Rougé, CEO for Municipal Water, Veolia North America.

"These vital improvements will make a significant impact in how the wastewater treatment plant functions in the community, by improving the quality of treated water released into San Francisco Bay, delivering more efficient operations to the city and better controlling the odors produced by the wastewater treatment process."

The wastewater system improvements are expected to provide additional environmental and financial benefits to Richmond, as more efficient equipment will require less energy and lower levels of chemical treatment to operate, reducing the city's costs as well as its greenhouse gas emissions.

These achievements exemplify the goals of Veolia's global GreenUp strategy, which strives to lead the ecological transformation of the planet by accelerating water quality improvement, decarbonization and technological innovation. Some 61% of Americans are concerned that worsening climate conditions may result in a deterioration of their quality of life, according to Veolia's Barometer of Ecological Transformation survey, and projects that respond to ecological threats while also addressing infrastructure needs help build long-term solutions for the environment and public health.



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## Blower & Vacuum Industry News



Veolia North America invested \$40 million for upgrades to the Richmond Water Pollution Control Plant.

The Richmond Water Pollution Control Plant construction project replaced outdated or ineffective equipment used in major functions at the plant:

- Fine screens – Two new mechanical fine screens were installed to filter out trash, rags and other larger debris from the wastewater stream. This prevents that material from clogging pipes and pumps, and potentially polluting the San Francisco Bay.
- Vortex grit removal system – Grit and sand settles at the bottom of wastewater treatment tanks, where it can cause wear and tear on machinery. The new grit removal system allows those fine materials to be easily separated from wastewater.
- Biofilter – Gases released by the wastewater treatment process are captured and forced through a new

filtration system. Many layers of porous materials in the biofilter promote the growth of specialized microorganisms that break down the odor-causing compounds.

- Blower building – A new structure holds powerful mechanical turbo blowers, which ingest outside air that is diffused into wastewater to promote the treatment process.
- Aeration basins – a new system in the bottom of wastewater treatment tanks diffuses air into the water as fine bubbles, rather than the previous mechanical mixing system. These fine bubble diffusers are more consistent, efficient and resilient than the prior system.

The completion of this construction project marks another milestone for Veolia's partnership with Richmond, in which Veolia is responsible for operating and maintaining

the city's wastewater treatment plant, sewer system and stormwater collection system. Since the partnership began in 2002, the city's environmental performance has improved significantly.

### About Veolia North America

A subsidiary of Veolia Group, Veolia North America (VNA) offers a full spectrum of water, waste and energy management services, including water and wastewater treatment, commercial and hazardous waste collection and disposal, energy consulting and resource recovery. VNA helps commercial, industrial, healthcare, higher education and municipality customers throughout North America. Headquartered in Boston, Mass., Veolia North America has more than 10,000 employees working at more than 350 locations across the continent. For more information, visit <https://www.veolianorthamerica.com>.

### Technologies on Display at Best Practices 2024 EXPO & Conference

The Best Practices 2024 EXPO & Conference is bringing the largest American event for on-site utilities to the Cobb Galleria Centre in Atlanta, Georgia, Oct. 29-31. Equipment sales engineers, engineering firms and manufacturing personnel will have the opportunity to meet the leading global manufacturers of compressed air, vacuum and cooling/chilled water technologies on the EXPO floor and learn about the latest innovations in air compressors, compressed air purification, aluminum piping, pneumatics, leak detection, compressed air measurement instruments and more.

Here is a roundup of the technologies that will be on display at the Best Practices 2024 EXPO.

### Air Compressor Technologies

(fixed, VSD, variable capacity drives; water- and air-cooled)

- 15-58 psig (2-4 bar): low-pressure; lubricated and oil-free rotary screw
- 80-220 psig (5.5-15 bar): lubricated reciprocating, rotary screw
- 45-190 psig (3-13 bar): oil-free scroll, reciprocating, rotary screw, centrifugal
- 145-6,000 psig (10-408 bar): boosters; lubricated, oil-free, reciprocating, screw
- 435-1,500 psig (30-102 bar): medium pressure; oil-free reciprocating, centrifugal

- 1,000-7,000 psig (68-476 bar): high pressure; reciprocating, centrifugal
- 25-5,000 psig (2-340 bar): low, medium and high pressure rental air compressors
- Controls, heat recovery, containerized systems, inlet/oil filtration, lubrication

### Compressed Air Purification and Aluminum Piping Technologies

- +38-50°F (3-10°C) dew point refrigerated dryers: non-cycling, cycling, VSD, HIT
- -20 to -100°F (-20 to -100°C) dew point desiccant and membrane dryers:

heatless, heated, heat-of-compression, deliquescent, membrane

- 435-7,000 psig (30-476 bar) high pressure refrigerated and desiccant dryers

### Liquid, oil aerosol, oil vapor, particulate and sterile filters

- Electric-timed and zero air-loss condensate drains and oil-water separators
- Aluminum piping systems, < 232 psig (16 bar), ¾" to 10" diameter (20-350mm)
- Aluminum piping systems, 232–1,015 psig (16-70 bar), ¾" to 2 1/2" diameter (20-63mm)

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## Blower & Vacuum Industry News

### Chiller and Cooling Tower Technologies (induced and forced draft, anti-microbial)

- Packaged cooling systems: closed-circuit, evaporative with pumps, closed loop chilled water with heat exchanger, dry coolers
- Industrial process chillers (0.6 to 150 ton cooling capacity)

### Blower and Vacuum System Technologies (fixed, VSD, variable capacity drives; water- and air-cooled)

- PD rotary lobe blower (4-15 psig or 0.3-1 bar) and vacuum pumps (3" to 15" Hg)
- PD rotary screw vacuum pumps: 166 to 551 acfm, 10-29" HgV
- PD rotary screw blowers: 190 to 5650 cfm, 4.4 to 15 psig (0.3-1 bar)
- Turbo blowers: magnetic bearing, single stage geared, high speed gearless, multistage centrifugal
- Rental blowers
- 15-58 psig (2-4 bar): low-pressure; lubricated and oil-free rotary screw

### Pneumatics, Leak Detection and Compressed Air Measurement Technologies

- Pneumatic actuators, directional control valves and components for pneumatic circuits

- Ultrasonic and acoustic imaging leak detection for compressed air
- Compressed air flow and dew point meters, pressure sensors, inlet and ambient temperature sensors

In addition to nearly 100 exhibitors, the EXPO will also feature the New Technology EXPO Classroom, which provides insights on new technologies from around the world. The classroom is reserved for exhibitors to present their latest technologies for compressed air, pneumatics, vacuum, chiller and cooling tower systems. This year's presentations will include information on cutting-edge compressed air and gas instrumentation technology, advancements in centrifugal controls, system auditing, hydrogen filtration technology,

sizing compressed air piping, gas compressor applications and much more.

The Best Practices 2024 EXPO & Conference is co-sponsored by the Compressed Air & Gas Institute and the Cooling Technology Institute.

#### About Best Practices EXPO & Conference

*The Best Practices 2024 EXPO & Conference is the leading North American event focused on sustainable, safe and reliable on-site utilities powering automation. The event takes place Oct. 29 to 31, 2024, at the Cobb Galleria Centre in Atlanta, Georgia. Attendees come from engineering firms, manufacturing plants and equipment companies responsible for specifying, purchasing, operating, selling and maintaining on-site utility equipment in industrial compressed air, vacuum and cooling water systems. For more information, visit <https://cabpexpo.com/attend>.*



*The Best Practices 2024 EXPO will feature the latest innovations in compressed air, vacuum and cooling/chilled water technologies.*

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## Opening Session Keynote Presentations Tuesday, October 29, 10:15AM – 12:00PM



**Opening Remarks**  
 Frank Mueller, President,  
 Compressed Air  
 & Gas Institute



**Compressed Air System Compliance with the ASHRAE 90.1 Commercial Building Energy Code**  
 Paul L. Baker, PE, Senior  
 Mechanical Engineer, Jacobs



**Enhancing Industrial Cooling Water Systems: Strategies and Benefits**  
 Abdulaziz Dulaijan, Engineering  
 Consultant, Saudi Aramco



**Ardagh's Asset Reliability Program: Compressed Air and Cooling Water**  
 Tate Pearson, Director of Facilities  
 Engineering & Asset Reliability, Ardagh  
 Glass Packaging – North America

## Plenary Session Keynote Presentations Wednesday, October 30, 10:15AM – 12:00PM



**Specifying CTI Certified Cooling Towers for Performance & Reliability**  
 Lee Seela, Mechanical Engineer –  
 Energy Division, Black & Veatch



**Reducing GHG Emissions With Integrated Heating, Cooling, And Compressed Air Design**  
 Philip Johnston, PE, Technical  
 Manager, Woodard & Curran



**Gates Performance System (GPS) Standards: Chiller, Cooling Towers and Compressed Air**  
 Alan Edington, Global  
 Energy Director, Gates



**Compressed Air Systems in the Amusement Park Industry – The Importance of Air Quality**  
 Sean Ferris, Senior Manager  
 Ride/Show – Facility Interface,  
 Universal Creative

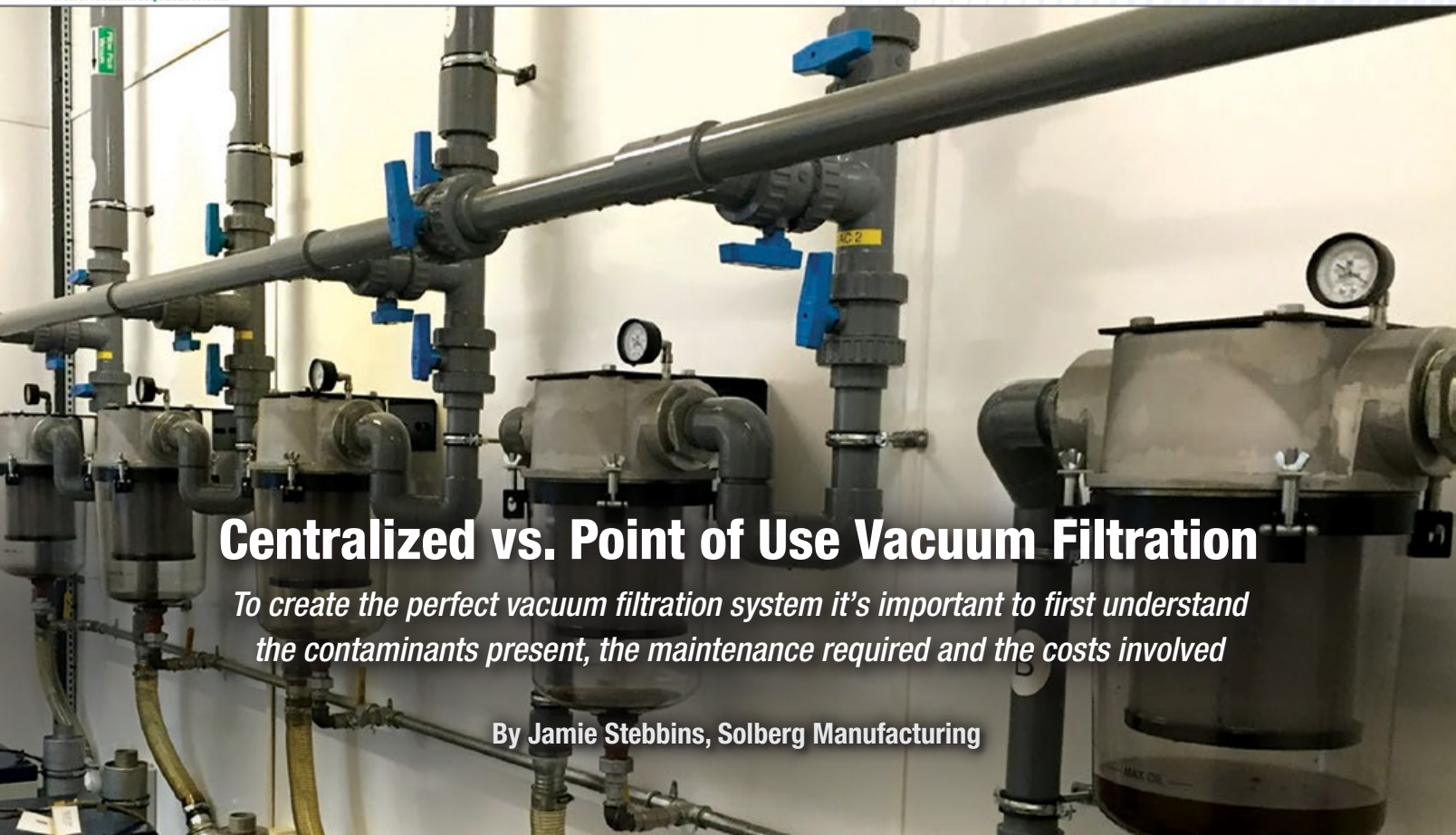
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## Centralized vs. Point of Use Vacuum Filtration

*To create the perfect vacuum filtration system it's important to first understand the contaminants present, the maintenance required and the costs involved*

By Jamie Stebbins, Solberg Manufacturing

▶ Manufacturing plant operators oversee many systems and are tasked with continuous improvement projects to grow productivity and throughput. In this article, we will isolate and review one system common to many plants and industries: the vacuum system. Within this system, we will further drill down to the filtration required to maintain a healthy process, which contributes directly to the bottom line. The vacuum system does not exist in many production process lines without filtration. Throughput and quality of the end product are closely tied to the necessary vacuum levels achieved when filtration is properly deployed.

### Planning a Centralized Vacuum Filtration System

What is a centralized filtration system and what are some pros and cons? A centralized filtration system is typically found between multiple

vacuum process lines and a centralized pump or group of pumps. This type of filtration must be engineered to mitigate challenge coming from multiple pieces of equipment. The challenge may be in the form of particulate, liquid, vapors or a combination. Complexity with a centralized filtration system is high due to the variability within each line. The filtration must be optimized to remove all forms of carryover from the process. Modularity may also be considered, allowing for forward engineering and greater flexibility with regards to current state and future state customization. The key to good filtration is leaving room for escalation should a process change or process line deliver more challenge over time (tolerances change). It is less expensive to build in capacity up front than to go back later to optimize an existing system.

Effective centralized filtration includes selecting filters appropriately sized for the amount of contaminants to be captured, while not impeding the flow or vacuum level required at the process. Designing a filtration system capable of handling multiple stages is effective where different filters target specific contaminants. An example would be a router table hold down application where heavy duty prefilters capture large particles, followed by pleated polyester filters removing finer particulate. Another example of multi-stage filtration would be a vessel designed to remove particulate, liquid and vapor all-in-one. This can be accomplished using a trap outfitted with a cooling function. Contaminants from the process enter the chilled vessel. The process gas laden with particulate, liquid and vapor is directed through a torturous path in the form

*Above: When removing liquids, drain configurations are an important design consideration for the filtration system.*

of a pleated fin pack. This fin pack is in direct contact with a cooling surface allowing the fin pack to act as the heat exchanger. Vapors are condensed and dropped out of the gas stream at the same time any particulate and liquid is dropped out. The gas stream is redirected through a polishing element to grab any potential residual contaminants prior to exiting the discharge of the filter vessel or trap.

Contaminant loads can vary widely between different process lines leading to design challenges when sizing centralized filtration systems. This is where a larger initial capital expenditure may be necessary to deliver the necessary filtration performance. Centralized filtration systems must also be able to tolerate fluctuations in flow rates from different process lines. Increasing vapor concentrations beyond the threshold of the thermal load a condensing trap is sized for may lead to bypass of contaminants. Again, forward engineering and understanding system design changes based on market conditions is critical. It's not only critical at time of commissioning, but also for future state as changes are made to end products.

### When to Choose Point of Use Filtration

Would it be less complicated to decentralize the filtration and build a system closer to the process? This does reduce the complexity associated with knowing what process line is producing what contaminant that needs to be removed from the gas stream prior to the inlet of the vacuum pumps. A decentralized or point of use (POU) filtration system also serves to protect the plumbing between a tool, chamber, packaging equipment or any



*A centralized bank of particulate filters protecting a vacuum pump system.*



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## Centralized vs. Point of Use Vacuum Filtration



Point of use particulate filters protecting vacuum pumps.

other equipment in a process where vacuum is applied. Depending on the facility and the length of lines between the process and the vacuum pumps, cleaning and keeping the lines free of contaminants that may choke or impede the conductance of a vacuum line can prove expensive. Vacuum pumps are carefully chosen based on the pumping curve and system performance required. This includes both the necessary vacuum level and flow required at the point of use or production end of the vacuum line.

Facilities with multiple laboratories are often ideal for POU filtration systems. These facilities

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are equipped with multiple vacuum line pickups. Each laboratory space may be pulling vacuum on unique processes that lead to facility vacuum line and header contamination. A POU filter takes the guess work out of designing a filter capable of handling not only various contaminants, but also the unknown challenge created when mixing contaminants. POU filtration in the laboratory environment allows for maintenance at the process level, reducing the impact on other pieces of equipment using the same vacuum source. POU systems are beneficial in reducing the complexity of maintenance and service efforts, as they isolate issues to specific points rather than affecting the entire system.

### Vacuum Filtration Questions to Ask

Which system is easier to service? With built in redundancy, either system can be serviced while avoiding disruption of vacuum at the process. Centralized filtration systems may allow for servicing to be accomplished in an equipment room and away from sensitive production areas. These areas may include clean rooms, rooms requiring washdown or clean in place (CIP) or any other hygienically sensitive area. This may come at the expense of not protecting the plumbing coming from multiple vacuum line pickups, feeding multiple headers that lead to the vacuum pumps. Plumbing acts as the arteries of the vacuum system. If these become clogged by particulates and liquids, it can negatively affect the performance of the pumping system. The cost associated with accessing and cleaning vacuum process lines can be expensive – especially for longer runs.

Does point of use filtration cost a lot more to deploy and maintain? While it may cost more to deploy multiple filtration units (one per process line), this cost may be offset by protecting lengthy runs of plumbing and multiple headers. Point of use filtration can also be optimized for the specific process line, minimizing the need to overengineer a centralized filtration system that needs to react to the variability of multiple lines and varying levels of challenge (particulate, liquids and/or vapors).

### Finding a Vacuum Filtration Partner

Selecting filtration is like playing offense and defense at the same time. You deploy a defense capable of optimizing pump performance which provides the necessary vacuum level and flow needed at the process. At the same time, your offense is predicting disruptions that may be encountered through changes in process materials or constituents.

Forward engineering with experts that deploy systems around the world is your best offensive and defensive measure. Both centralized and decentralized filtration systems can be designed to manage challenges expected at the inlet to the vacuum pump or inlet to the plumbing network. Both systems also make it possible to apply the principles of continuous improvement. Process carry over in the form of contaminants may change as products are optimized for market needs or environmental considerations. Regulatory updates that seek to improve access to clean air and clean water also play a role. Filtration helps companies achieve goals in the form of reduced particle counts or parts per million (PPM) exhausted into the environment, reducing the need to clean water discharged from a plant.

When partnering with filtration solution providers that seek to innovate and discover



*Two knockout tanks plumbed in parallel to protect a centralized bank of four vacuum pumps from ingesting liquids.*

## Centralized vs. Point of Use Vacuum Filtration

new possibilities, both centralized and point of use vacuum filtration systems are capable of being designed with the future in mind. That means delivering solutions that exceed manufacturing plant expectations through continuous learning, listening and seeking to understand current state and future state of operations.

By removing contaminants from the process gas or air stream, filtration systems ensure vacuum pumps operate at optimal efficiency, reducing energy consumption and improving overall system performance. Optimized efficiency and performance also comes in the form of reduced downtime due to vacuum pump maintenance. Helping operators avoid unscheduled shutdowns is a high priority when designing a filtration system. Achieving a vacuum pump OEM's regular maintenance intervals and planned number of pump operating hours between major overhauls is another goal of properly designed filtration solutions. Predictable maintenance and helping operators stay on track with their preventative maintenance schedules are additional metrics in tracking the effectiveness of a vacuum filtration solution.

Although the initial investment in a comprehensive filtration system might be significant, the return on that investment through improved product quality and increased operational throughput adds up quickly. On the other side of the balance sheet, innovative filtration solutions offer long-term savings through reduced maintenance, lower energy costs and improved equipment lifespan. **BP**



*This inventory of duplex vacuum filters allows the user to maximize uptime and offers exceptional flexibility for a manufacturing process.*

### About the Author

*Jamie Stebbins is a Vacuum Market Manager at Solberg Manufacturing. Stebbins's previous roles with Solberg include Territory Manager, National Account Manager and U.S. Director of Sales.*



*He works closely with OEMs to optimize filtration solutions in a diverse range of markets, seeking to improve process throughput and exceed operational expectations.*

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# Advanced Aeration Control for Blowers

*Sustainability goals have led to the development of new strategies for optimizing wastewater aeration blower performance*

By Tom Jenkins, JenTech Inc.

► The ideal blower control matches the blower airflow to the process demand. The process demand, in turn, must be established by the aeration control system.

Historically, aeration control systems have been feedback control with basin dissolved oxygen (DO) concentration as the controlled process variable. This control strategy has become standard practice in most treatment facilities because of its proven effectiveness in reducing energy consumption and improving process stability.

Increases in process complexity and demands for greater sustainability have driven

innovation in control system strategies. Meeting these demands has resulted in the implementation of new strategies, more capable controllers and new sensor technologies. These developments all influence blower control.

In many cases, owner requirements include incorporating advanced aeration controls into the blower system itself.

## Process Basics

Activated sludge with diffused aeration is the dominant technology in wastewater treatment. This is a biological process, with microbes suspended in the mixed liquor requiring oxygen to metabolize organic wastes and convert ammonia ( $\text{NH}_3$ ) to nitrate ( $\text{NO}_3$ ).

Efficiently controlling the airflow rate and oxygen supply to the process is the key to optimizing both energy consumption and process performance.

The advanced control systems discussed in this article do not replace DO control systems. Instead, they enhance the accuracy of determining the process demand for air or optimize the blower's performance.

## Floating Control

The most common control algorithm used for process control is Proportional-Integral-Derivative (PID). Although PID is effective for many process control strategies it has

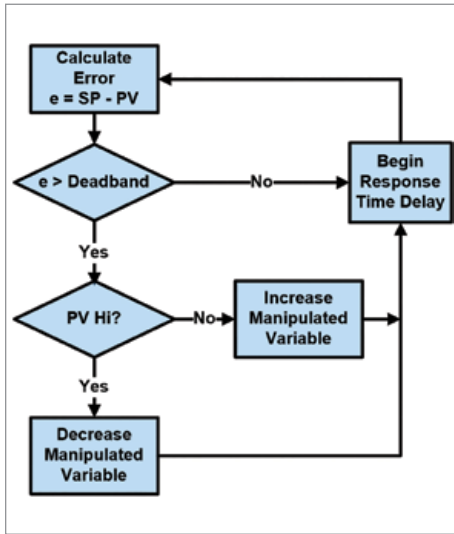


Figure 1. Floating control logic

limitations that affect its application to aeration control and DO control. The PID algorithm can be difficult to tune and is prone to hunting. PID control accuracy is impaired by long process response times and non-linear process response, both characteristics of the aeration process. A response to these shortcomings is floating control, sometimes referred to as “adjust, wait and see.”

Floating control tuning is more intuitive than tuning PID algorithms. The response time delay can be set to accommodate process response. The increase and decrease of the manipulated variable can be fixed steps or proportional to the error. It's common to have different values for increase and decrease to reduce hunting.

**Most-Open-Valve (MOV)**

MOV logic is intended to minimize the blower discharge pressure by keeping the aeration zone control valves as open as possible while maintaining set flow rates. This minimizes

the restriction to flow, which optimizes system pressure and blower power draw.

There are two principal MOV systems. The first works by manipulating the pressure's setpoint. The second manipulates valve positions and air flow directly.

Traditional blower controls work to maintain a constant discharge pressure. The blower control logic and aeration basin control logic operate independently. When valves at individual aeration control zones open or close to meet higher or lower process demand, the system backpressure decreases or increases. This causes the blower control to

increase or decrease airflow to match the new system demand, which increases or decreases system pressure.

In most instances where the MOV refinement is added to pressure control the position of the zone valves is monitored by a master control panel. If one of the zone valves closes below a set maximum position, for example 60%, the pressure setpoint incrementally decreases. This causes the blower output to decrease, which in turn results in lower flow to the aeration zones. The valves open to meet airflow demand. After a few iterations, the system stabilizes with the required flow provided to the process at a lower pressure, saving energy.



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## Advanced Aeration Control for Blowers

If the position of the valve that is most open is above a set maximum position, for example 70%, the above logic is reversed.

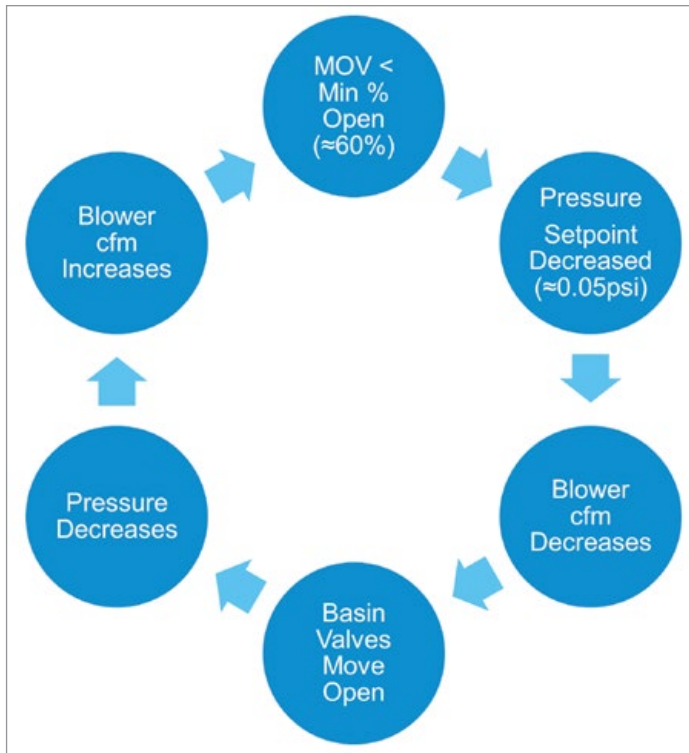


Figure 2. Pressure-based MOV logic

Pressure-based control works well if the blowers have adequate turndown. However, if the blower system is operating at the minimum allowable flow rate, all of the basin valves tend to travel towards the minimum open position. This reduces the air flow, raising the discharge pressure. If the blowers are at the maximum available flow all of the basin valves open, attempting to get more air. In both circumstances flow control accuracy is lost.

### MOV with Direct Flow Control

An alternative to pressure-based control is modulating system air flow rates based directly on airflow demand at the basins. This method generally provides more stability than pressure-based control. It relies on the ability of the master control panel to monitor and control both the blower's local control panels and the aeration basins.

Two techniques are implemented in the direct flow control method:

- The valve at maximum position – the most open valve – is not allowed to close until another valve reaches maximum position. The max position for a butterfly valve is typically set at 60% to 70% open.

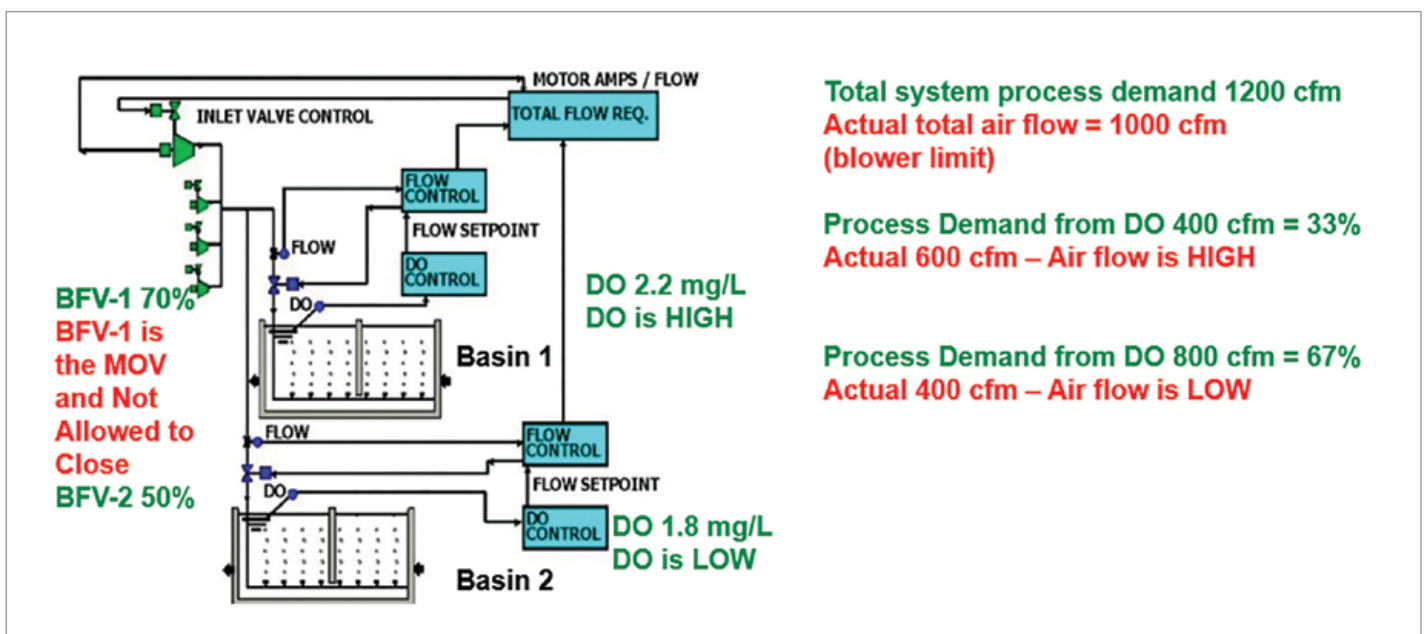


Figure 3. Example of MOV with direct flow control

➤ The target air flow used by the aeration zone flow control loop is based on a proportion of the total process demand and not on the process demand calculated by the DO control logic. This ensures if one zone is above its target flow, another will be below its target flow. In direct flow control there are three air flow rates associated with each control zone: the actual measured air flow rate, the process demand air flow rate based on DO control logic and the setpoint for the air flow control logic used to manipulate the valve. This is apportioned from the actual total flow rate and the total process demand from all zones.

on the apportioned fraction of the total process demand and the total actual air flow:

$$400 \text{ cfm} / 1200 \text{ cfm} = 0.33 \text{ and } 1000 \text{ cfm} \times 0.33 = 330 \text{ cfm}$$

The flow control setpoint is calculated for basin 2 in a similar manner:

$$800 \text{ cfm} / 1200 \text{ cfm} = 0.67 \text{ and } 1000 \text{ cfm} \times 0.67 = 670 \text{ cfm}$$

Note there are two ways to decrease the air flow to basin 1: close the valve controlling its air flow, or open the other basin's control valve, diverting air from basin 1 to basin 2.

After the apportioning is calculated, the air flow setpoints are implemented by the individual basin's flow control loops. Because it is the MOV, the basin 1 valve doesn't close, but the basin 2 valve will open. If basin 2 reaches its apportioned setpoint before reaching 70% open it will cease travel. If the basin 2 valve reaches 70% open, it will become the MOV and the basin 1 valve will begin to close. As the basin 1 valve closes, it will decrease its air flow and divert air to basin 2. When both basins reach their set airflow (See Figure 4), valve movement will cease.

The logic is best understood by a simplified example: The initial system status is shown in Figure 3. The total actual air flow from the blower system is less than the total process demand, meaning the blowers are maxed out. The maximum allowable valve travel is 70% open. The DO in basin 1 is above setpoint, and the DO logic will want to decrease the air flow. However, it is the most open valve, so the logic inhibits closing the control valve. Basin 2 DO is low, and its process demand is increasing.

The total process demand, based on DO control loops, is 1,200 cfm: 400 for basin 1 and 800 for basin 2. Basin 1 will base its flow control setpoint

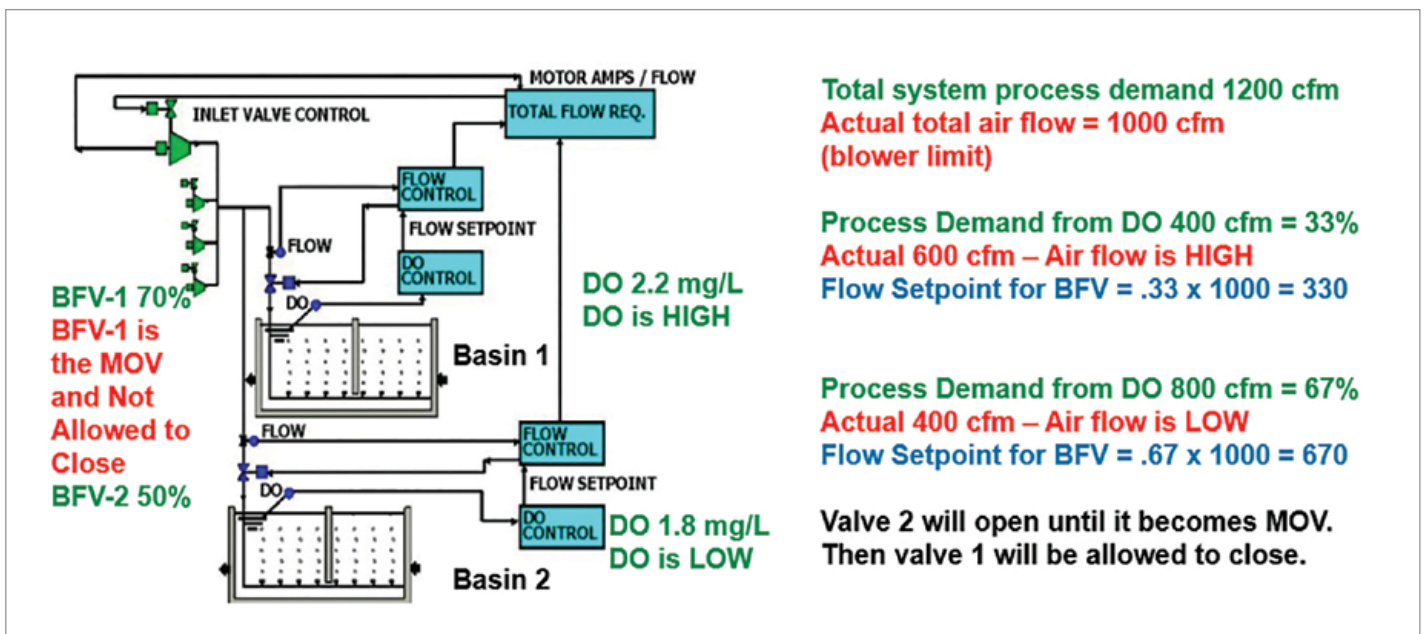


Figure 4. Both basins have reached their set airflow.

## Advanced Aeration Control for Blowers

### Ammonia-Based Aeration Control (ABAC)

The oxygen demand for converting ammonia to nitrate often doubles the total airflow requirement. The amount of oxygen required is determined by the stoichiometric ratio, 4.6 pounds of oxygen to each pound of ammonia converted. The airflow required is influenced by the oxygen transfer efficiency (OTE) of the aeration system. Because OTE improves at lower DO concentrations there are energy savings available by maintaining the minimum DO concentration that meets process objectives.

ABAC systems take advantage of the influence of DO on both OTE and the rate of biological conversion of ammonia. Within upper and lower limits, the rate of biological conversion increases with increasing DO. There are many variations, but most ABAC systems operate by manipulating the DO setpoint in response to an ammonia measurement near the effluent end of the aeration basin. If the ammonia level rises, indicating the rate of conversion is inadequate, the DO setpoint is increased. When the ammonia concentration drops again, the DO setpoint is reduced.

### Feedforward Aeration Control

Feedback control operates by responding to the difference between actual and desired process parameters. Feedforward control operates by directly responding to process load changes. This can minimize process errors and improve system stability.

Two things are necessary for feedforward control. First is the ability to measure the process load in real time – the oxygen demand of the aeration system. Second is a mathematical model of the process response to the controlled variable – the transfer of oxygen from the supplied airflow.

The required parameters are obtained from offgas analysis (See Figure 5) By capturing the bubbles from the surface of the aeration basin and analyzing the residual oxygen content, the OTE can be calculated. The OTE and the measured airflow can provide the actual oxygen transfer rate (OTR) and oxygen uptake rate (OUR). The mathematical model of oxygen transfer uses the OTE to calculate the airflow necessary to sustain the DO concentration essential for maintaining the proper mixed liquor biology.

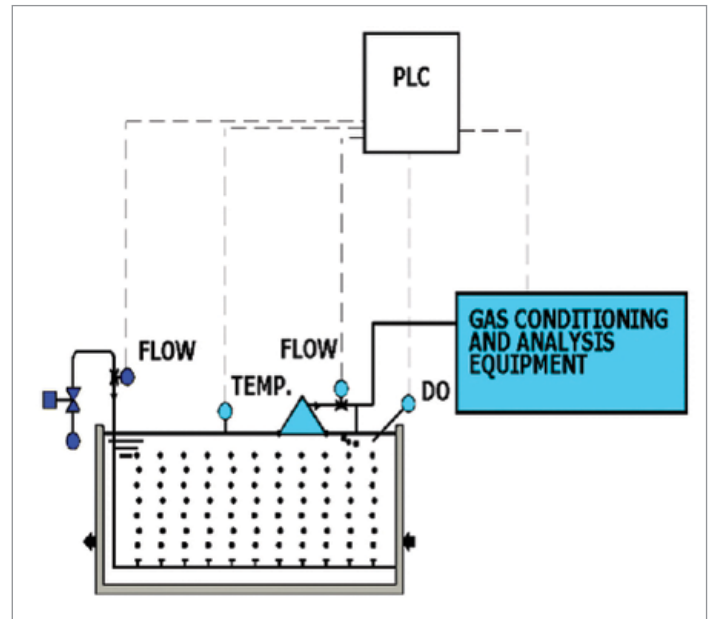


Figure 5. Offgas measurement system

### Summary

Fifty years ago, automatic air flow control based on feedback from DO setpoints was cutting edge technology. Since then, increasing process demands and increases in energy awareness have driven the development of new and more elaborate technologies. The descriptions provided above are far from comprehensive. They cannot cover the numerous variations employed and in development. Exploration of the literature and suppliers' offerings is necessary to determine whether or not an advanced process and blower control strategy is appropriate for each application. **BP**

### About the Author

Tom Jenkins has over 40 years' experience in blowers and blower applications. As an inventor and entrepreneur, he has pioneered many innovations in aeration and blower control. He is an Adjunct Professor at the University of Wisconsin, Madison. Tom is the current Chair of the ASME PTC 13 Committee. For more information, visit <https://www.jentechinc.com>.

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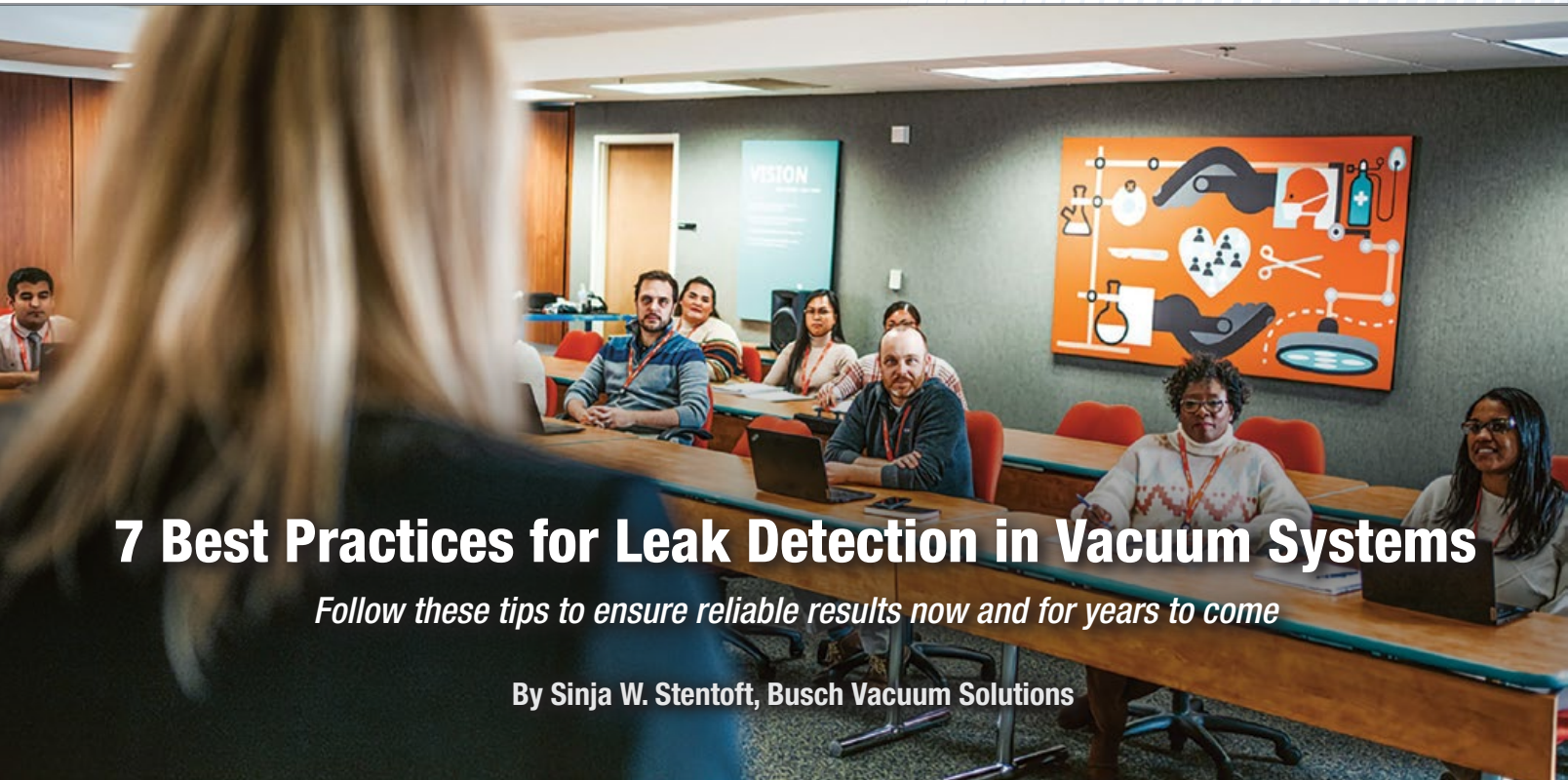
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# 7 Best Practices for Leak Detection in Vacuum Systems

*Follow these tips to ensure reliable results now and for years to come*

By Sinja W. Stentoft, Busch Vacuum Solutions

▶ Leaks in vacuum systems can cause considerable damage to sensitive industrial processes. The vacuum pump's ability to generate and maintain the desired vacuum level is compromised as the process gas escapes the pump or contaminants – such as air, dust and debris – enter. This leads to accelerated wear and tear of internal components such as seals and gaskets, and the vacuum pump may fail or require more frequent servicing. As a result, energy bills and overall operating costs increase drastically, while output quality suffers. This is why helium leak detectors play a vital role in safeguarding the integrity of equipment.

Not all leaks are obvious. Some may be extremely small or hidden, requiring a systematic approach to detect them. Adopt these seven best practices to conduct accurate and effective leak detection tests. Whether you're a seasoned professional or a first timer, these guidelines will enhance the efficiency of

your leak detection process using the tracer gas helium.

## 1. Train Employees on Testing and Safety Precautions

Training operators to use a leak detector is essential for collecting accurate test results and increases the longevity of testing equipment. If operators are taught how to use a leak detector, they are less likely to record incorrect data. Training should include studying the instruction manual and participating in training courses.

Additionally, it's imperative to set and adhere to safety protocols. This includes the use of personal protective equipment (PPE) when working with helium and other potentially hazardous substances. One needs to be careful when handling helium gas as it can act as an asphyxiant in high concentrations. A combination of training and safety guidelines will optimize the performance of

leak detectors while maintaining a secure working environment.

## 2. Create a Stable Testing Environment

To ensure precise results, leak detection tests must be performed in a stable environment with a consistent temperature. Higher temperatures cause helium molecules to expand, leading to lower gas density. This increases the buoyancy and dispersion rate of the gas. At the other extreme, colder temperatures make helium molecules contract, increasing gas density and making the gas move at a slower rate. These changes in the behavior of the tracer gas affect how it moves through or around the test object, impacting the accuracy of the leak detection test. A stable environment ensures the gas behaves consistently, leading to reliable outcomes. Additionally, keeping both the equipment and the testing area clean is crucial. Dust, oil and other particles can interfere with leak detection equipment reliability.

*Above: Be sure employees are trained on leak detection testing equipment and safety procedures.*

### 3. Prepare the Testing Environment

The equipment being tested – a pipeline or container, typically – should be clean and dry, and the area free of gases or substances that might interfere with the accuracy of the leak detection process. Zero the leak detector so that it starts from a clean slate. Without zeroing, the detector might not recognize small leaks. Adjust the sensitivity settings based on the expected leakage rate to minimize false positives.

Select the testing method that suits your vacuum system. A spray test is suitable for components under vacuum. In this test, helium is sprayed onto the equipment’s surface. If there is a leak, the incoming molecules of the tracer



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## 7 Best Practices for Leak Detection in Vacuum Systems



gas will be drawn into the leak detector, which measures the leakage rate. For components under pressure, a sniffing test is suitable as it detects escaping gases. Helium is pumped into the test object and a sniffer probe – a tool designed to detect and locate leaks – is guided over it. The sniffer probe functions similarly to a metal detector, but it's searching for traces of helium. Both tests are easy to perform and deliver accurate results.

Perform tests slowly and don't move the leak detector when it's in operation. That could disturb the turbomolecular vacuum pump, causing damage to the equipment or compromising the accuracy of the test.

Record the data from your leak detection tests to identify trends.

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#### 4. Stay on Top of Repairs

Once a leak has been detected, repair it immediately. Conduct another leak detection test afterwards to ensure the leak has been sealed. Performing regular leak detection tests is crucial for preventative maintenance. Taking a proactive approach ensures the detection methods are aligned with industry standards, contributing to a consistently effective leak detection system.

#### 5. Record Data

Keep detailed records from each leak detection test, including the date, time, location, equipment used and severity of the leak. Having detailed records allows for a comprehensive comparison between the detected leak rate and the acceptable limits for the specific application. By collecting and organizing the data, you can identify trends and form prevention strategies.

#### 6. Maintain Testing Equipment

Follow the manufacturer's maintenance schedule to keep your leak detector in optimal working order. Performing calibrations helps preserve the accuracy of the equipment, as testing carried out during calibrations checks whether or not the detector is still sensitive and responsive to the tracer gas. Adhering to these guidelines will help the leak detector work reliably for years to come.

#### 7. Dispose of Hazardous Materials Safely

Recycle or dispose of helium gas cylinders in accordance with local regulations. Stay up to date with industry standards governing leak detection and emissions control in order

to minimize the release of volatile organic compounds and hazardous air pollutants.

Adopt these seven best practices to guarantee efficient leak detection, ensure the safety of your testing process, maintain test result quality and safeguard your vacuum pumps. Focusing on training, safety protocols and a stable testing environment ensures your equipment delivers accurate results. Keeping careful records, performing regular maintenance and calibrating your leak detector optimizes the process and increases the longevity of your equipment. By following these practices, both beginners and experienced professionals can locate leaks, keep the workplace safe and contribute to a cleaner and safer industrial area. **BP**



Perform calibrations regularly to preserve the accuracy of leak detection equipment.

#### About the Author

*Sinja W. Stenoft is Editor Communications at the Busch Group. During her time at the company, she has gained extensive knowledge of vacuum technology in a wide variety of industries. She holds a bachelor's degree in linguistics and a master's in intercultural communication. Before joining the Busch Group, Sinja worked in the life sciences industry.*

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# Blower & Vacuum Technology News

## Busch Vacuum Expands O110 Digital Services to Include Vacuum Systems

Busch Vacuum Solutions has expanded its range of O110 Digital Services to include vacuum systems. O110 for systems enables the simultaneous monitoring of multiple vacuum generators in a vacuum system and the supervision of the production process to ensure it runs reliably and with the correct vacuum levels. This effectively minimizes the risk of production downtime and leads to significant cost savings. Accessible via a PC or a mobile device, the O110 IoT dashboard presents a user-friendly interface for comprehensive system monitoring.

O110 for systems provides extensive insights into the status of production processes. Customers can define parameters specific to their process, such as process vacuum level, absorbed power or ambient temperature. O110 measures and stores these parameters. Thus, costly breakdowns can be avoided as the ideal moment for the next maintenance is indicated. With the appropriate service contract, the analysis of the data and remote

*Busch Vacuum's O110 Digital Services has been expanded to include vacuum systems.*

supervision of the process is carried out by Busch, on-site service for a quick fix included.

O110 IoT kits are available to retrofit existing vacuum systems. Via an integrated electronic SIM card, the O110 box transmits the signals from the sensors securely to the Busch cloud, where they are interpreted and sent to the O110 IoT dashboard. O110 for systems can be operated as a stand-alone solution or integrated into the Busch control system.

With the addition of O110 for vacuum systems, Busch is expanding its already comprehensive range of O110 solutions. O110 excels in early problem detection, aiding in the prevention of unplanned downtime in factories. Ultimately, it ensures optimal process safety, contributing to increased productivity.

### About Busch Group

*The Busch Group is one of the world's largest manufacturers of vacuum pumps, vacuum*

*systems, blowers, compressors and gas abatement systems. Under its umbrella, the group houses three well-known brands: Busch Vacuum Solutions, Pfeiffer Vacuum and centrotherm clean solutions. The Busch Group manufactures in its 19 own production plants in China, the Czech Republic, France, Germany, India, Romania, South Korea, Switzerland, the United Kingdom, the USA and Vietnam. For more information, visit <https://www.buschvacuum.com>.*

## Atlas Copco's Beer Foam Separator Increases Production Efficiency

Atlas Copco, a leading brand in the beer industry for air compressors and N<sub>2</sub> generator systems, recently introduced a new innovative solution for the beer bottling process – the Beer Foam Separator (BFS 900). Built to be used in combination with its industry 4.0 ready GHS VSD+ screw vacuum pump, the addition of the beer foam separator is primed to improve energy efficiency, reduce lifecycle costs and lower the rejection rate of over and underfilled bottles in the process.

The beer foam separator was designed and developed in partnership with leading brewery customers and in direct response to the excess foam production that hampered the beer filling process. The high amount of foam generated at the end of the filling process would enter the vacuum line and disrupt the process, leading to poor quality, reduced output.

Through innovative engineering and rigorous testing, Atlas Copco's Beer Foam Separator (BFS 900) actively solves the foam issue with its smart features and easy to maintain design –



providing full protection to the vacuum pump and saving on costs too.

“Like we always say – we provide not just products, but solutions. Our new beer foam separator is an example of this. Our vacuum pumps and the systems we build contribute significantly to maintaining quality, shelf life and, ultimately, customer satisfaction. This also encourages more trust and reliability for consumers, vital for our valued customers,” said Pamela Cateland, Marketing Manager West, Atlas Copco Vacuum.

The BFS 900 is fabricated from 304 stainless steel for high durability with an auto-draining tank and associated logic control system. When the excess foam enters the vacuum system, it is effectively collapsed in the foam separator by a calming section with a large diameter for foam settling. The rising liquid level is detected by appropriate sensors and an automatic separation process is initiated by an air lock consisting of electro-pneumatic actuators and a receiver tank to enable drain in continuous operation.

The separator is also clean-in-place (CIP) capable. A shower ball mechanism ensures reach to all internal parts, granting compliance to required hygienic standards.

“Addressing process concerns for the beer industry effectivity with our innovative capabilities and application expertise is a focus point for us,” said Alesandro Villa, Applications Manager, Atlas Copco. “That’s why we spent a lot of time perfecting this

particular component for the beer industry because we wanted to design a system that would not only protect the pump but would offer a higher level of energy-efficiency and savings for our customers.”

The beer foam separator’s effective design delivers several benefits for manufacturers looking to make their beer bottling process more efficient and sustainable. Its prominent features include:

- No water wastage: In comparison to other technologies, this unique system requires zero water.
- Auto-drain function: Control valves are in place to automatically drain, vent and isolate system components.
- Durable design: The stainless-steel construction ensures better resistance to corrosion and contamination.
- Energy savings: Coupled with GHS VSD+ efficient technology, it delivers up to 40% energy savings versus traditional technologies.
- Hassle-free maintenance: The system’s integrated cleaning cycle makes onsite cleaning easier.



*Atlas Copco has launched a beer foam separator with the intelligent GHS VSD+ rotary screw vacuum pump.*

- Reliable sensors: Level sensors measure beer collected in the drain tank and radar type sensors measure foam level.

High-quality beer, cleaner production floor and sustainable operations – The Atlas Copco beer foam separator effectively tackles the foam issue and provides several benefits for the overall bottling process. Along with the intelligent features of GHS VSD+, it’s a solution that brings a new level of efficiency for the beer industry.

#### **Atlas Copco Vacuum Technique**

*Atlas Copco Vacuum Technique collaborates with its customers to turn industrial ideas into leading edge technology in vacuum and abatement solutions. Its passionate people, expertise and service bring sustainable value to industries everywhere. It's headquartered in Cologne, Germany, with production centers in Germany, France, Belgium, Czech Republic, the United States and China. For more information, visit <https://www.atlascopco.com>.*

## Blower & Vacuum Technology News

### AERZEN Expands Delta Hybrid Screw Blower Series

For 160 years, AERZEN has been developing high-performance machines for industry and continuously driving the development of compressor technology with innovations. The latest coup: the new sizes of the successful Delta Hybrid series. The innovative screw blowers with direct drive using gear wheels, optional IE5 synchronous permanent magnet motor and integrated VFD are digitally ready and impress with maximum energy efficiency, the smallest footprint, maximum user-friendliness and absolute process reliability. A compact plug and play solution for the highest demands.

AERZEN rotary lobe compressors, also known as screw blowers, stand for the highest level of innovation, uncompromising quality, exceptional energy efficiency and unconditional reliability and are used worldwide in a wide variety of applications. With the innovative

further development of the successful series, AERZEN is now taking the next step. The future-oriented design sets new scales regarding energy efficiency, durability, machine footprint, digitalization, low noise levels and maintenance requirements, making the new sizes an absolute high performer in process air generation.

The new Delta Hybrids provide reliable, 100% oil-free process air and operate highly efficiently and economically in an extended turndown ratio of up to 1:5. Energy savings of up to 37% compared to conventional blowers are possible. This is unique on the market and supports applications in a targeted manner to greater resource and cost efficiency. This major leap in efficiency is achieved thanks to a sophisticated technology concept that is precisely tailored to customer requirements. The most important components include an innovative compressor stage with new, highly efficient screw rotor profiles and internal flow optimization, a direct drive for the use of motors with energy efficiency class IE4 or IE5 including an integrated VFD and a smart oil system. The synchronous reluctance permanent magnet motors also offer high efficiency in partial load operation.

The robust design ensures unrivalled reliability. Even under the most difficult environmental conditions, the Delta Hybrids ensure safe operation. The new screw blowers are designed for intake temperatures from -40°F to +122°F (-40°C to +50°C) and therefore cover an extended field of application. An optional acoustic hood for outdoor

installation allows the machines to be used even under direct weather conditions. Delta Hybrid packages are ready for immediate use on delivery and take up a minimum floor space. The space-saving side-by-side installation and the excellent volume flow per square meter value result in smaller machine rooms and thus lower building investments. Massive capacity increases can thus be realized in the smallest of spaces.

The intelligent AERtronic package control system is already integrated and takes over the efficient control and monitoring of the Delta Hybrid. All data can be transmitted to the master control system and accessed via browser, tablet or mobile phone. The result is maximum machine availability, reliability and efficiency.

The new Delta Hybrid sizes achieve a maximum sound pressure level of 75 dB(A), making them among the quietest on the market in their performance class. Thanks to the flexible modular system, the silencer technology can be selected to comply with customer and application requirements. Operation and maintenance are performed exclusively from the front and rear. The exceptionally long oil change and maintenance intervals reduce service costs. The drive components are completely maintenance free. The machines are already filled with oil on delivery and can be easily transported by pallet truck, forklift truck or crane.

#### About AERZEN

*The AERZEN product portfolio includes rotary lobe compressors, positive displacement blowers, turbo blowers and screw compressors and, in addition to standard products, also offers customized*



*The innovative screw blower series offers an IE5 synchronous reluctance permanent magnet motor as well as an integrated VFD.*

special solutions. Digital services can be used to increase efficiency, availability and productivity in a sustainable and future-oriented manner. In addition, AERZEN After Sales Service offers a full range of services – from full maintenance contracts to repairs and modernizations of existing plants. For more information, visit <https://www.aerzen.com>.

**Pedro Gil Introduces RPG Lobe Blower**

The industrial landscape is ever evolving, driven by significant innovation and technological advancements. A critical element in this progress is the development of industrial blowers, a technology that has dramatically transformed over the years. From its rudimentary beginnings to the

sophisticated systems we see today, industrial blowers have become essential in a myriad of applications, ranging from manufacturing to environmental management.

In this realm, Pedro Gil stands out for its constant innovation and pursuit of excellence. With a rich history and reputation for quality and reliability, the company remains at the forefront of air blower technology. Pedro Gil is excited to introduce the new RPG Lobe Blower.

The RPG Lobe Blower represents a significant advancement in Pedro Gil’s line of industrial blowers. Developed with a deep understanding of the current market needs, this blower not

only stands out for its energy efficiency, which is key to reducing operational costs, but also for its contribution to industrial sustainability.

Its features include:

- Innovative design: Tailored to deliver superior performance across various industrial applications, from manufacturing to environmental management.
- Energy efficiency: Engineered to operate at maximum efficiency, thus reducing energy expenditure and operational costs.

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## Blower & Vacuum Technology News

- **Robust construction:** Quality and durability that ensure a safe and long-term investment.
- **Versatility:** Suitable for multiple uses across different industrial sectors, making it an essential and versatile tool.

Pedro Gil combines experience and technology to deliver solutions that exceed the expectations of modern industry. With the RPG Lobe Blower, the company reaffirms its commitment to innovation and customer satisfaction.

The RPG Lobe Blower by Pedro Gil is aimed at a diverse and demanding market that spans from manufacturing to environmental management and energy. Its versatility makes it ideal for a variety of applications, reflecting its ability to adapt to multiple industrial



*Pedro Gil has launched the RPG Lobe Blower.*

needs. This blower is not just a product; it's a game-changer in its target market due to its impressive efficiency, unmatched reliability and environmental sustainability.

The development of the RPG Lobe Blower is the result of intense research and a strong commitment to innovation, showcasing Pedro Gil's desire to push current technological boundaries to meet the changing needs of the industry.

### **About Pedro Gil**

*Pedro Gil has been providing high technology products with high efficiency and excellent reliability for more than 100 years. The company continues to offer leading-edge technology, service and quality so that its clients can enjoy global cover and efficient after sales service. For more information, visit <https://www.pedrogil.com>.*

### **Edwards Vacuum Expands Dry Claw Vacuum Pump Range**

Adding to the nEDC 300 pumps, Edwards Vacuum has announced the nEDC 65-150 models that complete its range of robust dry claw vacuum pumps for the lower pumping speed classes. With features such as robustness, efficiency and easy handling of contaminants, the smaller pumps are also ideal for applications in the areas of water and wastewater, thermoforming, vacuum conveying, food processing and medical technology. Similar to the nEDC 300, the smaller sizes also offer an uncomplicated, cost-effective solution

to fulfill the important requirements in the applications.

“The bottom line is that this latest generation of claw pumps is designed for reliable and efficient operation,” said Megha Ajmal, the Responsible Product Manager, Edwards Vacuum. The developers have achieved these features thanks to the oil-free pump chamber and the low-wear, corrosion-free internal components, among other things. “The vacuum pump also impresses with its effective air cooling and its compact housing, which enables installation even in tight spaces,” said Ajmal.

The modular design of the Edwards dry claw pump offers further benefits for the nEDC 65-150 models. For example, the inside of the pump is easily accessible to users for maintenance and repairs because the developers have separated the gear and pump chambers. This means the claw pump can be easily cleaned by users themselves and then quickly put back into operation. Furthermore, no special tools are required for the simple operations. This results in low downtimes and an almost uninterrupted production process.

The pump characteristics of the claw pump enable sustainable, profitable operation with low total operating costs. These pumps achieve higher process outputs as their motors are VSD compatible. In applications where contamination by particles or process gases occurs, the vacuum pump is also resilient and insensitive. Edwards Vacuum's engineers

have achieved this not least through the use of innovative construction and coating materials as well as stainless steel claws.

Another distinguishing feature of the nEDC models is their moderate temperature profile. The temperatures inside the pump are comparatively low. This extends the service life of the seals and prevents oil leaks. Furthermore, this results in long-term operation without the need for constant cleaning of the pump chamber. An additional advantage for users of the robust dry claw vacuum pumps is the integrated base silencer, which means that they take up less space and operate much more quietly.

**About Edwards Vacuum**

*Edwards is a leading developer and manufacturer of sophisticated vacuum products, exhaust management systems and related value-added services. Edwards has over 7,000 employees worldwide engaged in the design, manufacture and support of high technology vacuum and*

*exhaust management equipment and has state-of-the-art manufacturing facilities in Europe, Asia and North America. Edwards is part of the Atlas Copco Group. For more information, visit <https://www.edwardsvacuum.com>.*



Edwards Vacuum has added nEDC 65-150 models to its range of robust dry claw vacuum pumps.

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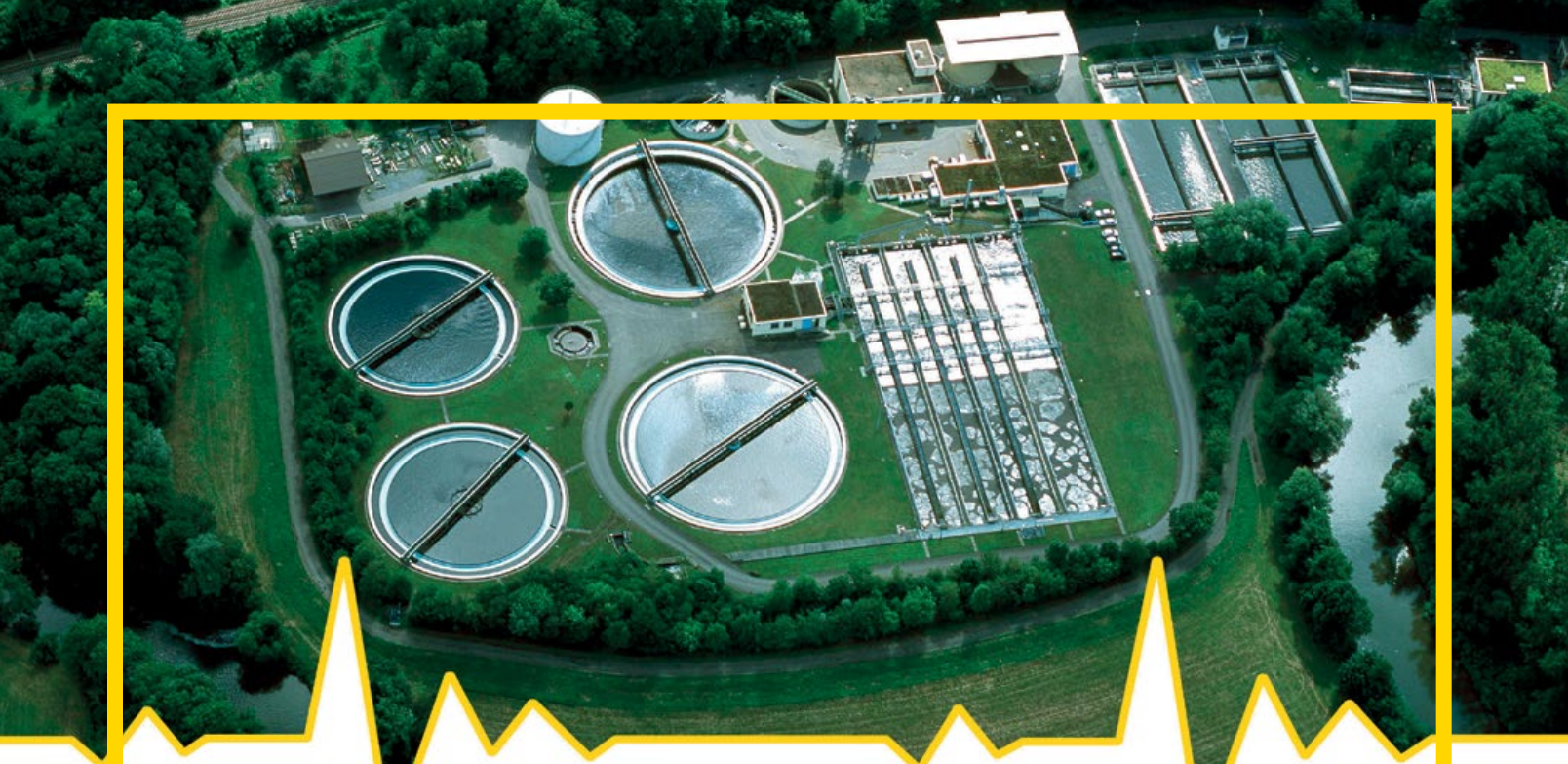
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