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May 2025



Optimizing Wastewater Treatment

**INDUSTRIAL VACUUM
& BLOWER SYSTEMS**

**10 Basics of Industrial
Vacuum Systems**

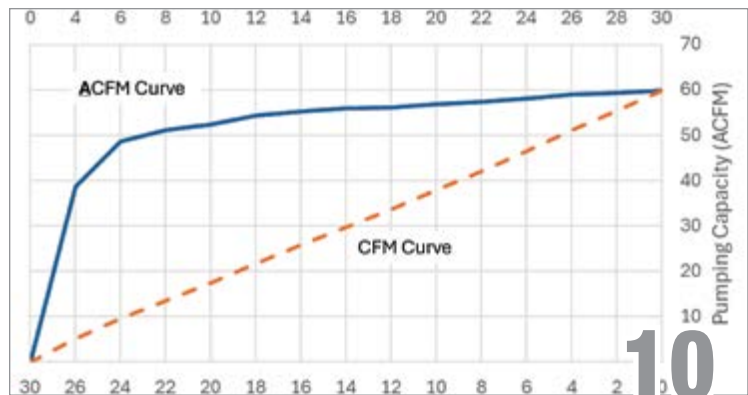
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NEWS / Blower & Vacuum Industry & Technology

John Ansbro Joins Aerzen USA as President, Bringing Over 30 Years of Industrial Leadership and Expertise

Aerzen announced the appointment of John Ansbro as President of Aerzen USA Corp. With over 30 years of experience in the industrial sector, Ansbro has a strong history of driving growth, operational excellence and cultivating customer-focused cultures.

Ansbro will lead Aerzen USA's strategic direction in his new position, using his executive leadership experience and industry knowledge to advance the company's objectives. He will focus on enhancing Aerzen's

market presence, increasing customer value and improving operational efficiencies to address customers' evolving needs across various sectors.

"I am excited to join Aerzen USA and look forward to working with our talented team to drive innovation and growth," said Ansbro. "Together, we will strengthen our commitment to providing exceptional service and solutions to our customers."



John Ansbro, President,
Aerzen

This appointment is a crucial step for Aerzen USA as the company continues to innovate and expand its product and service offerings to meet the industry's increasing demands. Ansbro's leadership will ensure the company's growth and reinforce its status as a trusted partner in industrial solutions. For more information, visit <https://www.aerzen.com/us>.

Leybold Launches TURBOVAC MAG iS Models for Industrial Applications

With the TURBOVAC MAG 2807 iS and 3207 iS Maglev turbomolecular pumps, Leybold is launching two compact turbomolecular pumps in the pumping speed class of 3,000 l/s. Equipped with magnetic rotor bearings, these highly robust, low-vibration pumps are ideal for clean, hydrocarbon-free, high vacuum conditions. They are well-suited for applications in research and development and industrial fields such as coating, electron beam processes, space simulation chambers and beamline applications.



TURBOVAC MAG 2807 iS

"The exceptional performance of the vacuum pumps is due to their compact design and extended maintenance intervals," said Jinane Haddad, Product Manager, Leybold.

The vacuum pumps have maintenance intervals of up to 80,000 hours or 10,000 cycles. In addition to these attributes, the vacuum specialists at Leybold placed great emphasis on the ratio of maximum pumping speed to footprint during development. The TURBOVAC MAG iS delivers excellent performance values in terms of pumping speed and gas throughput – with speeds of up to 3,200 l/s, at a maximum throughput of 26 and 33 mbar l/s for Ar and N₂ respectively. For more information, visit <https://www.leybold.com/en>.

Busch Group USA Acquires Total Maintenance Solutions

Busch Group USA, headquartered in Virginia Beach, VA, has expanded its market presence by acquiring Total Maintenance Solutions (TMS), in Milan, IL. This strategic acquisition brings together two respected companies in the vacuum and overpressure industry, strengthening Busch's market position.

Turgay Ozan, President, Busch Group USA, said, "TMS has built a strong reputation for exceptional responsiveness, timely delivery and cost-saving solutions for its customers. We welcome TMS and its growing business into the Busch Group family of companies."

Following the acquisition by Busch, TMS will continue to operate as an independent division, keeping all staff unchanged. Customers and distributors will continue working with their established TMS contacts.

Jeff Schmidt, General

Manager, TMS, said, "This acquisition provides TMS with enhanced resources, allowing us to offer even more vacuum solutions to our customers while providing expanded growth opportunities for our employees." For more information, visit <https://www.tmsvacuum.com> and <https://www.buschvacuum.com>.



Nick Taiber of St. Martin Holding Company, Rod Schmitt of TMS, Sami Busch and Turgay Ozan of Busch and Jeff Schmitt of TMS (left to right)

NEWS / Blower & Vacuum Industry & Technology

Becker Strengthens Global Presence with Canadian Facility

Becker Pumps announced the opening of Becker Canada Vacuum Technology Corporation, a fully owned subsidiary located in Bolton, ON. This expansion marks a major milestone in the company's commitment to delivering localized, high-quality support to industries across Canada.

Canada's industrial sector continues to grow, and, with it, the demand for high-quality vacuum and pneumatic solutions has increased. Becker has long been a trusted partner to Canadian businesses, but until now, its services were primarily provided through distributors. By establishing a

dedicated presence in Canada, Becker is ensuring customers receive the fastest, most efficient service possible.

The Bolton facility allows Becker to provide faster service and support, expanded inventory, on-site repairs and maintenance and localized expertise.

"Our new facility in Bolton is a significant step forward in enhancing service and accessibility for our Canadian customers," said Jason Rathbun, President and General Manager, Becker Americas. "By positioning ourselves closer to the industries we serve,



Becker Canada Vacuum Technology Corporation in Bolton, Ontario

we're not just improving convenience – we're building stronger relationships, optimizing efficiency and fostering innovation. This investment underscores our long-term commitment to the Canadian market." For more information, visit <https://beckerpumps.com>.



Eurus Blower's
ZCS 824 Vacuum
Truck Blower

Eurus Blower Launches the ZCS 824 Vacuum Truck Blower

Eurus Blower, a wholly owned subsidiary of Shandong Zhangqiu Blower Co., announced the introduction of the ZCS 824 Vacuum Truck Blower to the North American market.

The Eurus ZCS 824 Vacuum Truck Blower is a heavy-duty blower designed with integral shaft, ductile iron impellers. The blower is center-timed for rotation in either direction. The precisely aligned gears and bearings offer consistent and superior performance at an affordable price. It provides up to 4,460 cfm with a 15 psi max delta pressure and 18" Hg max delta vacuum.

Roger Blanton, General Manager, Eurus Blower, said, "This exciting ZCS 824 blower offers our customers a greater selection of high-quality blowers. The ZCS product introduction complements recent ZDL Bulk Truck Blower, EBox Factory Standard Packages, ISB Series Screw Blower, VR Series (steam blower) product introductions and growing success with our multistage centrifugal product. Eurus Blower's customer service focus is unmatched in the North American market as we continue meeting customer needs." For more information, visit <https://eurusblower.com>.

EDWARDS VACUUM Develops Magnetically Levitated Turbomolecular Pumps

EDWARDS VACUUM has developed a new series of magnetically levitated turbomolecular pumps that can withstand the demands of both challenging industrial environments and research processes. The oil-free nEXT2807M and nEXT3207M Maglev pumps are specially designed for areas where a contamination-free vacuum is required for high process quality. The virtually maintenance-free models (up to 80,000 hours) are among the lightest and most space-saving turbopumps in their class.

"In actual use, the nEXT M pumps offer their users a whole range of advantages," said Jinane Haddad, Product Manager, EDWARDS VACUUM. "Besides their low vibrations, which is crucial in many environments, the pumps also feature hydrocarbon-free performance, durability and versatility, with efficient water cooling. This results in an overall extension of the operating and maintenance intervals and ultimately a higher pumping capacity of the nEXT M series." For more information, visit <https://www.edwardsvacuum.com>.



nEXT3207M and nEXT2807M
Maglev pumps

Lone Star Blower Name Changes to Lone Star Turbo

Lone Star Blower announced it has officially changed its name to Lone Star Turbo. This strategic rebranding reflects the company’s commitment to growth, scalability and its expanded product offerings.

The name change to Lone Star Turbo signifies the company’s evolution and its dedication to providing cutting-edge turbo technology solutions to a broader range of industries.

“We are thrilled to unveil our new name, Lone Star Turbo, which better represents our vision for the future,” said Andrew Balberg, President, Lone Star Turbo. “This rebranding aligns with our mission to deliver advanced, scalable solutions that meet the evolving needs of our customers. Our commitment to innovation and excellence remains unwavering.”



The new Lone Star Turbo logo

Lone Star Turbo will continue to operate from its current headquarters in Houston, TX, and all existing contracts and agreements will remain in effect. For more information, visit <https://lonestarturbo.com>.

Festo Introduces the VTEP Proportional Valve Terminal

Festo introduces the VTEP, a proportional valve terminal. The VTEP is an ideal solution for flexible gripping, web tensioning, force-controlled polishing, precision piloting, dispensing, dosing and diaphragm pump control.

The VTEP valve terminal provides closed-loop control of moderate air flow – vacuum up to 35 l/min. It comes in 2-, 3- and 5-valve variants, which can control up to 10 channels. The VTEP features an EtherCAT digital communication interface for real-time communication and full data transparency.

Users set performance parameters per channel and the valves provide closed-loop controls to those presets. Valves deliver highly dynamic response and precise pressure control to achieve “target reached” status for each channel, similar to the “motion complete” function in electric drive technology. For more information, visit <https://www.festo.com>.



The VTEP provides closed-loop control of moderate air flow on up to 10 channels.



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LET’S TALK

about efficiency and sustainability
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Optimizing Wastewater Treatment with a High-Performance Aeration Blower System

By Sam Gooldy, Senior Manager, Marketing and Product Development, UCA



► In a strategic move to enhance environmental sustainability and operational efficiency, Universal Compressed Air (UCA) partnered with a leading waste services provider in the Southeast to design, build, own, operate and maintain a state-of-the-art blower System for wastewater pond aeration. This innovative solution, part of a five-year agreement, delivers over 20,000 scfm of low-pressure air while guaranteeing uptime, performance and significant cost savings.

“As we look to the future, we remain dedicated to developing solutions that enhance productivity, reduce energy consumption and support a greener planet,”

Above: Universal Compressed Air's headquarters in Center Valley, PA

said Rick Kowey, Executive Vice President and COO, Universal Compressed Air. “This project is a testament to what’s possible when innovation meets sustainability.”

Project Overview: Overhaul the System

It was clear: The customer’s aeration blower was faltering, and, in turn, its entire aeration system was underperforming. Unfortunately, when a wastewater aeration system is underperforming there’s a risk of a septic condition developing. When that happens, incomplete conversions can take place and you can literally smell the problem.

Major components of the aeration blower system would go offline and it could take

days or weeks to bring them back online. Site resources were strained and the ability to manage system downtime was a major drain on the customer’s resources. A significant system overhaul was needed if the site was going to meet its corporate and community commitments.

The project’s goal was straightforward: Replace the customer’s unreliable and inefficient aeration blower system with a new, highly dependable, energy-optimized solution, all without interrupting production. To achieve this, the provider planned and executed a seamless transition by installing and commissioning the new aeration blowers one by one. This included the engagement of the provider’s Project Management team

with the customer's Operations team to ensure that as new aeration blowers were brought online they performed as needed in a stable condition for a best practices prove-out period prior to the shutdown of legacy blowers.

The modular Blower System, owned and operated by UCA, produces between 15,000 and 25,000 scfm of low-pressure air supporting wastewater pond aeration. This precision delivery of low-pressure air ensures critical biological processes continue uninterrupted, breaking down organic matter efficiently.

To meet the customer's high-reliability expectations, the provider deployed an N+1 blower system. If N equals the amount of normal or typical capacity needed to support demand, N+1 indicates an additional component – an aeration blower unit, in this case, added to support a single failure or required maintenance on a given

component. During normal operation, one of the installed aeration blowers is always waiting in reserve as a backup. This redundancy philosophy plays a crucial role in the system's design. Each piece of equipment and instrument has a backup, meaning no single point of failure can cause the aeration blower system to miss meeting the demand requirement. This level of redundancy provides a high level of certainty and confidence the plant can maintain operational flow rates throughout the life of the contract.

Technical Breakdown: Inside the Blower System

The Blower System includes seven positive displacement rotary screw aeration blowers, each rated over 400 hp, with a total delivered flow capacity in excess of 30,000 scfm at an operating pressure of 10-12 psig. These aeration blowers were chosen for their ability to provide consistent, oil-free air across varying flow rates, a crucial

feature for wastewater aeration where demand fluctuates throughout the day. This selection marks a significant upgrade from the site's legacy aeration blowers, offering significantly improved efficiency and game-changing reliability.

The Blower System is paired with an advanced auxiliary support system, including variable frequency drives (VFDs) and an advanced control system.

The VFDs allow the unit to automatically adjust the aeration blower motor speed in real time which in turn modulates the aeration blowers' discharge airflow production to closely match the aeration system's demand. This ability to match airflow production with aeration demand is core to designing a highly efficient system.

The advanced control system manages dissolved oxygen based on the customer defined setpoint. UCA's monitoring systems



The completed installation of an aeration blower system

» Optimizing Wastewater Treatment with a High-Performance Aeration Blower System



The completed installation of an aeration blower system

typically include integrated pressure sensors, flow meters and smart control algorithms deployed to optimize aeration blower performance, reduce energy use and prevent pressure surges.

Waste heat or excess heat is often an unused byproduct in the blower/compression cycle. Depending on the project economics, a heat recovery option may be included in the product design. Heat recovery allows for the recapture of excess heat from aeration blower operation, repurposing it for on-site processes or facility heating, contributing to the plant's overall energy savings.

Cost Savings and Environmental Impact

The new aeration blower system is projected to save the customer over \$1 million during the five-year contract. These savings stem from improved energy efficiency and reduced

downtime. The high-performance aeration blowers consume significantly less electricity than the customer's outdated legacy system. Plus, the N+1 modular design with built-in redundancies ensures maximizing uptime while minimizing the likelihood of a costly interruption.

Additional savings come from the optimized system design and maintenance reallocation. Smart controls and real-time monitoring keep airflow and pressure at optimal levels, avoiding wasteful over-aeration. Also, all system monitoring, planned and unplanned maintenance and total system upkeep is managed by a team of operators and maintenance personnel.

Beyond cost savings, the environmental impact is equally impressive. The enhanced aeration process reduces greenhouse gas emissions by lowering energy consumption

and supporting better wastewater treatment, ultimately contributing to cleaner water release.

Managed Maintenance for Industrial Customers

This aeration blower project reflects a commitment to delivering sustainable, reliable solutions through the PIPELINE AIR™ plan, which offers a fully managed compressed air (blowers are just low-pressure compressors) utility model tailored to large-scale industrial users. This plan guarantees reliability, as the provider designs, owns and maintains the aeration blower system, eliminating operational risks for customers. It also guarantees performance, since customers gain real-time monitoring of flow, pressure and dewpoint to ensure their aeration blower system always operates at peak efficiency. Finally, it delivers fixed monthly costs, since the model

includes no capital investment or unexpected maintenance fees, only a predictable, transparent payment structure.

When operational burdens are removed, customers are able to focus on their core businesses while reaping the financial and environmental benefits of optimized compressed air systems.

Building a Sustainable Future

The successful installation and startup of this aeration blower system combine innovative technology, thoughtful system design and a steadfast commitment to sustainability. The provider not only delivered immediate results for the waste services customer, but also laid the groundwork for long-term environmental and economic benefits. **BP**

About the Author

Sam Gooldy is the Senior Manager, Marketing and Product Development for UCA. With over 25 years of experience in the compressed air and blower industries, including more than 15 years in leadership roles at Cameron and Ingersoll Rand, Gooldy brings a blend of applications aptitude, product vision and a commitment to innovation. He holds a BS in Chemical Engineering and an MBA.



About Universal Compressed Air

Universal Compressed Air specializes in developing, designing, building and maintaining cutting-edge compressed air solutions for a wide range of industrial and high-tech applications. Its

PIPELINE AIR™ approach removes operational burdens from customers while guaranteeing reliability, energy savings and reduced environmental impact. For more information, visit <https://ucaair.com>.

For similar articles on **Aeration Blowers**, please visit <https://www.blowervacuumbestpractices.com/technology/aeration-blowers>.



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A photograph of the Quincy Compressor manufacturing headquarters in Bay Minette, AL. The building is a large, modern industrial structure with a blue metal roof and white walls. The Quincy logo is visible on the building's facade. The building is surrounded by a well-maintained lawn with several large, rounded bushes in the foreground and trees in the background under a clear blue sky.

Industrial Vacuum System Basics

By Benjamin Cameron, Business Line Manager, Vacuum, Quincy Compressor

► The objective of this article is to make vacuum systems a little less confusing by providing some foundational vacuum principles. Naturally, the best place to start is with an examination of air compressors! Air compressors take air from an open system (the atmosphere) and discharge it into a closed system, resulting in a higher pressure. The potential energy of high-pressure air is then used to serve an operational purpose. We're comfortable with air compressors. Many of us own one for household use as they help us paint, operate nail guns, work on cars and tease kids with blasts of cold air on a hot day.

Alternatively, vacuum pumps extract air or gases from a closed system and exhaust to atmosphere. The resulting less-than-atmospheric pressure in the closed system is then used to serve useful functions. Vacuum systems are used in many of our day-to-day

activities and products, including the cruise control in your car, the dentist's office, wastewater infrastructure and packaged meats. Some of us still remember the drive-thru bank canisters flying overhead like torpedoes full of money. The word vacuum, however, can prompt even experienced equipment personnel to seek a change of topic. How can that be? Vacuum is simply a different region of the pressure spectrum. This article will cover vacuum basics, and, where possible, draw on the differences to air compressors as a familiar reference.

Vacuum Units of Measurement

No conversation about vacuum system basics is complete without addressing the often-confusing units of measure. Air compressors provide pressure above and beyond atmospheric pressure. As such, the discharge pressure is almost always expressed using gauge measurement (psig).

Vacuum systems are commonly measured in both absolute and gauge measurements.

On the absolute measurement scale, the smaller the numerical value the deeper the vacuum level. With gauge measurements, the larger the numerical value the deeper the vacuum level. Typically, applications requiring deep vacuum levels will express vacuum in absolute terms like torr or mmHg, while most other industrial applications express vacuum in inches of mercury (gauge).

Flowrate vs. Horsepower

When it comes to sizing an air compressor, the conversation often revolves around "How many horsepower do you need?" The typical range of air compressor discharge pressures is 100-150 psig, a span of 1.5:1. In that range, the delivered flow rate (cfm) per horsepower changes little. Therefore, horsepower can easily be used as a proxy for sizing.

Industrial vacuum applications cover a large range of operating vacuum levels. For example, chemical applications might

Above: Quincy Compressor's manufacturing headquarters in Bay Minette, AL

require deep vacuum of 0.25"HgA, while pick-and-place applications might require a shallower vacuum of 15"HgA. That's a span of 60:1! Across such a wide range of vacuum levels, the flow rate of a vacuum pump can change considerably. Therefore, much more attention is paid to flow rate when sizing a vacuum pump.

SCFM vs. ACFM

Since the inlet to an air compressor is generally atmospheric pressure, the Compressed Air and Gas Institute (CAGI) has adopted a set of conditions for standardizing air compressor performance data published by manufacturers. Therefore, most air compressor technical data sheets reflect scfm at 14.5 psia and 68°F (20°C).

Since the inlet pressure of a vacuum pump can vary depending on the application, the flowrate on most vacuum pump data sheets is commonly adjusted to actual conditions, acfm. It's important that anyone involved in specifying and sizing vacuum pumps is

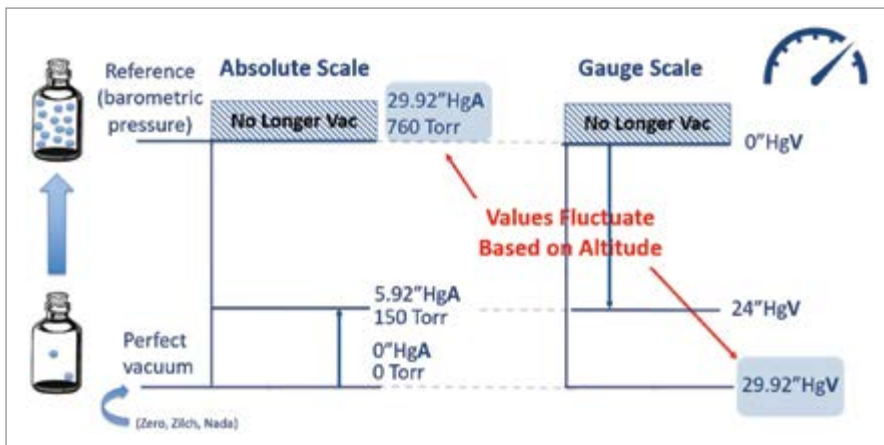


Diagram 1. Vacuum systems are calculated in both absolute and gauge measurements.

aligned with the terminology being used, as misunderstandings can be costly.

Note that vacuum pump manufacturers often publish marketing literature describing a “nominal” flow rate. This is generally the highest acfm at any point along the performance curve. Since the shape of the curve can differ among vacuum pump technologies and

manufacturers, it's best to avoid the comparison of nominal flow rates whenever possible. Instead, look at each curve and compare the actual flow rate at the specific desired vacuum level.

Altitude Adjustments

If your facility uses gauge measurements to evaluate vacuum, extra precaution might be necessary to size a vacuum pump when located at higher altitudes. This is because of two factors. First, the barometric pressure (the reference for gauge measurement) is different at higher altitudes. Second, manufacturer performance curves are typically created with sea-level barometric pressure conditions. A good approach to avoid complications is to convert the gauge measurement to absolute and then compare them to the pump curve. As a rule of thumb, you can estimate the local barometric pressure by subtracting 1"Hg from 29.9"Hg for every 1,000 feet above sea level.

Example: A production facility located 2,500 feet above sea level requires 45 acfm at 23"HgV. If altitude is not considered, a process engineer might reasonably select a pump with the performance shown in

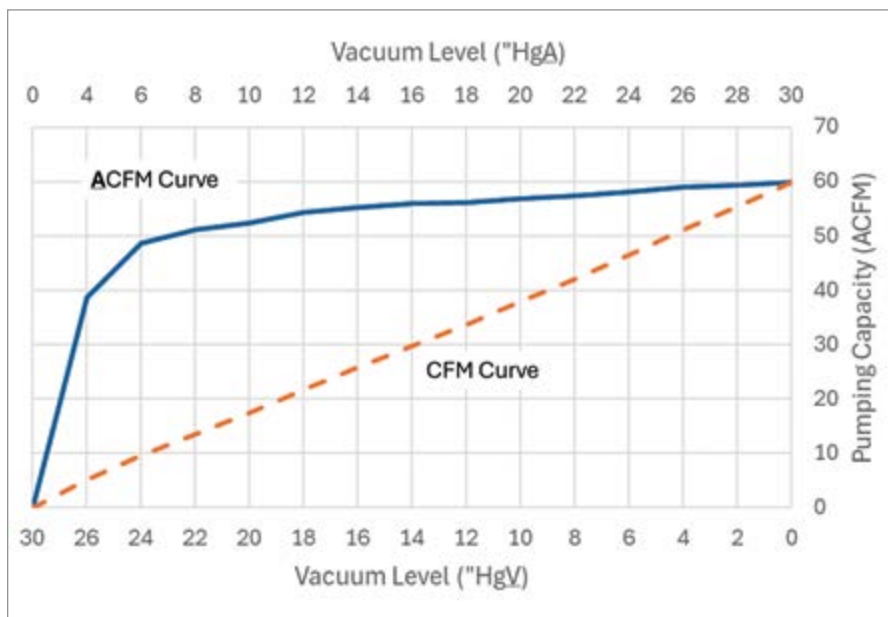


Diagram 2. Vacuum system flow rate is typically adjusted to actual conditions.

>> Industrial Vacuum System Basics

Diagram 3 (the green point). As described previously, the barometric pressure at the facility would be estimated to be as 29.9"Hg – 2.5"Hg = 27.4"HgV. When reviewing the manufacturer's standard performance curve, the engineer needs to ensure the vacuum pump can provide 45 acfm at 4.4"HgA (27.4"Hg – 23"Hg). In this case, the vacuum pump selection is insufficient to meet the need.

When operating at deep vacuum levels or using vacuum pump technologies with limitations to continuous duty end-pressure, it becomes much more critical to consider altitude.

Pressure Drop

Ever tried drinking a thick milkshake through a skinny straw? It takes a lot of work. Sometimes, it doesn't work regardless of how hard you try (spoon to the rescue!). When it comes to flow through a pipe,

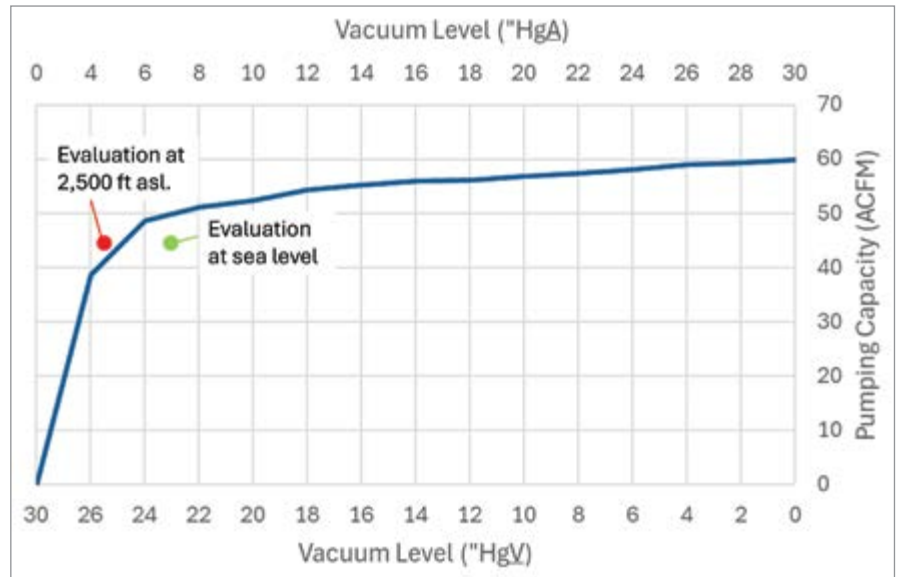


Diagram 3. Engineers need to consider altitude when sizing vacuum pumps.

frictional losses are unavoidable. The more frictional losses through the piping, the greater the pressure drop. Since the performance of a vacuum pump can vary considerably at different vacuum levels, it's

important to consider the influence of piping architecture on pump selection.

If the vacuum pump is located far away from the point-of-use, the pipe size is too small or there are many bends and valve obstructions in the line, then the vacuum requirement at the point-of-use can differ considerably from what's required of the vacuum pump. Diagram 4 illustrates how the vacuum load at the top of a distillation column might differ from the load at the vacuum pump inlet, given the stated pressure drop. If vacuum system piping architecture is not considered, the best-case scenario is the selected vacuum pump has enough capacity to overcome the piping losses. In the worst-case scenario, more pumps, bigger pumps or a different pump technology might be required. Solving that issue after the fact is harder than simply reaching for a spoon!

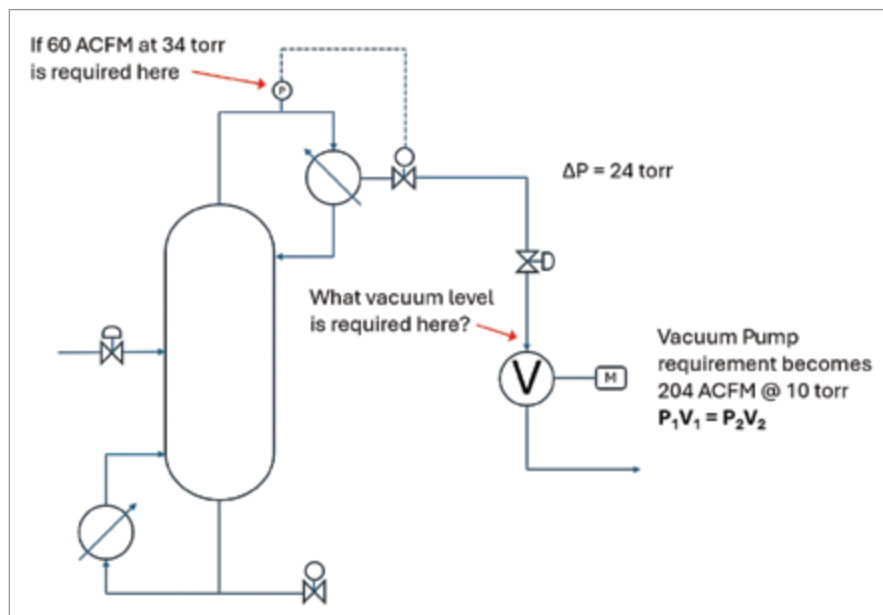


Diagram 4. The vacuum piping system can lead to significant pressure loss.

A few best practices to consider for vacuum system pipework:

- Aim for less than 10% pressure drop from point-of-use in design.
- For single vacuum pump installations, size vacuum system piping to match the inlet size of the vacuum pump.
- For multiple pump installations, have the vacuum pump manufacturer use software to model the vacuum system piping layout of the facility and mathematically confirm piping size and pump selection.

into a waste container under the fume hood. That means walking all the way to the other side of the lab when the vacuum outlet is within arm’s reach. What would you do?

Vacuum points-of-use are upstream of the vacuum pump. Therefore, anything drawn into the vacuum system and left unobstructed will enter the pump. Many vacuum pumps have been crashed by ingesting solid items, liquid slugs and everything in between (such as greases and pastes). Good design practice is to include mitigation measures such as particulate filters and liquid collection tanks ahead of the pump.

However, one must also consider the compatibility of the process gases with the

pump. If the process gas is incompatible with the lubricating or sealing oils, vacuum pump technologies that use oil in the compression chamber (referred to as wet technologies) would be unsuitable. These are technologies such as oil-lubricated rotary vane, oil-lubricated rotary screw and liquid ring vacuum pumps. Instead, a technology that does not use a lubricating or sealing fluid in the pumping chamber (referred to as dry technologies) would be needed. These technologies include rotary claw, dry screw and rotary lobe blowers.

When the correct pump technology is paired with upstream protections, the long-term reliability of equipment is ensured. After all, not everyone makes the same choice in the chemistry lab.

Wet vs. Dry Pump Technologies

It’s been a long day in the chemistry lab, and nobody else is around. Proper procedure is to pour residual solvents from the experiment

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Conclusion

Many products use both compressed air and vacuum systems at some point in their manufacturing and packaging process. With an understanding of the vacuum principles covered here, you can approach your next vacuum project with the same confidence as you approach air compressor projects. **BP**

About the Author

Benjamin Cameron is Quincy Compressor's Business Line Manager for Vacuum. He's worked in the vacuum business for nearly 18 years in application engineering, systems building, product management and sales and marketing. He holds a BS in Chemical Engineering from Virginia Tech and an MBA from Old Dominion University.

About Quincy Compressor

Founded in 1920, Quincy Compressor is a leading designer and manufacturer of reciprocating and rotary screw air compressors, vacuum pumps and a full line of air treatment components. Headquartered in Bay Minette, AL, the company has built its reputation on quality and rugged reliability, building tough air compressors and vacuum pumps for the most demanding applications. For more information, visit <https://www.quincycompressor.com>.

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