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May 2023

## INDUSTRIAL VACUUM & BLOWER SYSTEMS

22 **Six Steps to a  
Tailor-Made  
Vacuum Solution**

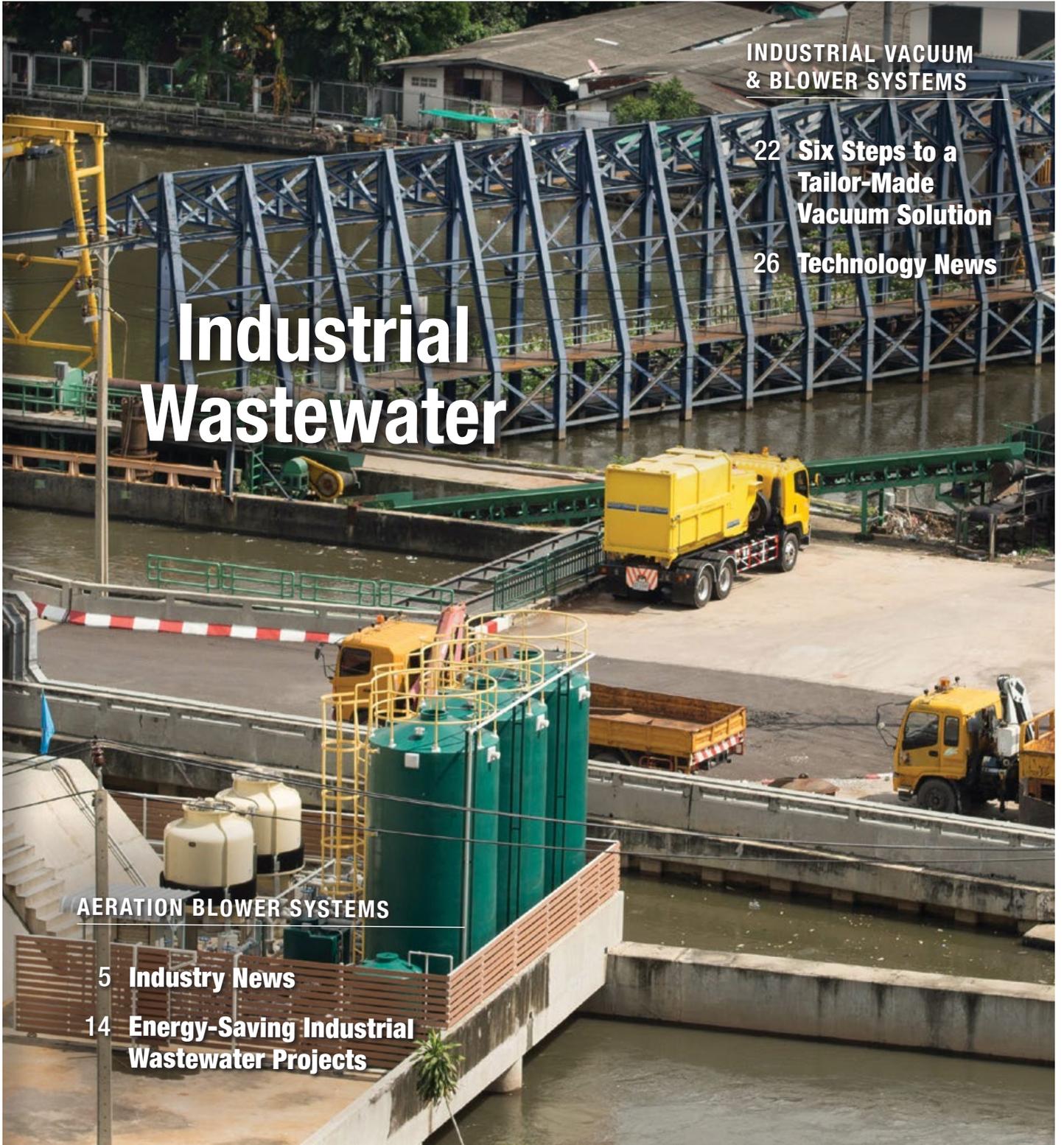
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# Industrial Wastewater

## AERATION BLOWER SYSTEMS

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Wastewater Projects**





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## AERATION BLOWER SYSTEMS

### 14 Energy-Saving Industrial Wastewater Agitation Projects

By Hank Van Ormer, APenergy



## INDUSTRIAL VACUUM & BLOWER SYSTEMS

### 22 Six Steps to a Tailor-Made Vacuum Solution

By Fabian Falbusch,  
Busch Vacuum Solutions

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# From the Editor



As Spring arrives, we invite our readers to consider registering for the Best Practices 2023 EXPO & Conference, co-locating with Process Expo and taking place at McCormick Place in Chicago on October 23-25, 2023. Registration is now open-visit [www.cabpexpo.com](http://www.cabpexpo.com)!

## Industrial Vacuum & Blower Systems

Industrial vacuum systems are critical for sustainable, safe and reliable automation. Each application is different and requires expertise. Busch Vacuum Systems has sent us an excellent article titled, “Six Steps to a Tailor-Made Vacuum Solution.” When plants invest the resources to receive and deploy expert application engineering is when we observe “Best Practices” occurring.

## Aeration Blower Systems

Industrial plants have a great variety of wastewater treatment requirements. Hank Van Ormer from APenergy, has sent us a very interesting article titled, “Energy-Saving Industrial Wastewater Agitation Projects.” Unlike aeration projects, the main goals of agitation are to keep solids in suspension and in movement. Compressed air and blower air are standard options when looking for solutions.

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

**RODERICK M. SMITH**

Editor

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## Upcoming Webinars

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- **May 11, 2023:** Vacuum System Fundamentals: Depth of Vacuum vs. Absolute Pressure – *Presenter Andy Smiltneek, President, Growth Solutions Consultants*  
*Sponsored by Rogers Machinery*
- **June 8, 2023:** Vacuum Pump Maintenance – *Presenter Tie Duan, Solutions Engineer, E.W. Klein & Co.*  
*Sponsored by Kaishan*
- **July 23, 2023:** Engineering Rooms for Aeration Blowers – *Presenter Tom Jenkins, P.E., President, JenTech Inc.*  
*Sponsored by APG-Neuros*
- **November 30, 2023:** Vacuum System Efficiency – *Presenter Andy Smiltneek, President, Growth Solutions Consultants*  
*Sponsored by Rogers Machinery*



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## 2023 MEDIA PARTNERS



# Blower & Vacuum Industry News

## Busch Vacuum Solutions Builds New Production Plant in China

Busch has over 40 years of history with China. In 1981, Busch was the first German industrial company to sign a cooperation agreement to manufacture in China after the reopening of the country. In 2001, an independent subsidiary was established in Shanghai. Today it is one of the largest and most successful Busch sales and service companies worldwide.

“We have a close relationship with China. This investment in Caidian District is another fruitful outcome of our cooperation with China,” said Kaya Busch, Co-Owner, and Co-CEO of Busch Vacuum Solutions, in his speech before the signing ceremony.

In his speech, Sami Busch, Co-Owner, and Co-CEO of Busch Vacuum Solutions, said, “Caidian District has a clear location, excellent facilities, and many professionals. We believe this investment in Caidian District will be a milestone in our Group’s history, and we look forward to the opening of our new plant.”

Wuhan is centrally located in China at the confluence of the Yangtze River and the Han River. The city is the industrial hub of central China and has manufacturing operations in many industries, including iron production and automotive. Wuhan also has China’s largest inland water port, the region’s largest airport, one of the country’s most prestigious universities, and is conveniently located on one of the world’s fastest rail links connecting Shanghai to Hong Kong.

The Busch family also has a deep connection to Wuhan. Directly after the outbreak of

the Corona Pandemic in early 2020, Busch delivered twelve urgently needed MINK claw vacuum pumps to support the construction of the hastily built Huoshenshan Emergency Hospital. Therefore, Kaya and Sami Busch visited the hospital and could see the MINK vacuum pumps in location.

Busch is expected to start production in the new plant in 2025. However, the company is already producing at a rented site in Caidian. So far, 15 employees have been hired. Busch’s goal is to build talent successively because the company attaches importance to long-term employment relationships. The Chinese production facility is expected to employ 400 people in the future.

The signing of the investment agreement received a great deal of media coverage in China. Representatives from a total of 14 Chinese media, including TV stations, were present at the event to report and conduct interviews with Sami and Kaya Busch.

## About Busch

*Busch Vacuum Solutions is one of the world’s largest producers of vacuum pumps, vacuum systems, blowers, and compressors. Its extensive product portfolio comprises solutions for vacuum and overpressure applications in all industries, including the chemical, semiconductor, medical technology, plastics, and food sectors. It also covers the design and construction of customized vacuum systems, as well as a global service network. The Busch group is a family-owned company and is still managed by the Busch family. Busch Vacuum Solutions has 3,800 employees in more than 60 companies in over 40 countries and agencies worldwide. Busch is headquartered in Maulburg, in southwest Germany. This is the location of Busch SE headquarters, as well as the German production facility and German sales company. In addition to Maulburg, Busch also has its own production plants in Switzerland, the UK, Czech Republic, Korea and the USA. For more information, visit [www.buschvacuum.com](http://www.buschvacuum.com).*



After the signing (front from left to right): Kaya Busch, Co-Owner and Co-CEO of Busch Vacuum Solutions, Yu Congbin, Mayor of Caidian District, Sami Busch, Co-Owner, and Co-CEO of Busch Vacuum Solutions. (Back row between Kaya Busch and Yu Congbin): Jonathan Schoo, Vice President – AHK Greater China (Chamber of Commerce Abroad, Representation of German Business in China).

## Blower & Vacuum Industry News

### Edwards and Dacon Complete New Massachusetts Headquarters

Dacon Corporation has completed a 135,000 SF new headquarters for Edwards Vacuum, a designer and manufacturer of advanced technology parts used in the semiconductor, power, renewable energy, scientific R&D markets, analytical instrument manufacturers, chemical and food processing industries. Their portfolio spans parts for vacuum and abatement and this location is dedicated to cryopump manufacturing.

The design of this 2-story LEED facility centers on 4 functional domains – manufacturing, labs, offices and warehousing, “The objective was to create a state-of-the-art, innovation

and solutions center that improved the overall efficiency of assembly, research & development, new product introductions and related operations activities,” said John O’Sullivan, General Manager of Edwards Vacuum. In consideration of renewable energies, some of the location’s LEED initiatives include provisions for a future solar setup, reduced water usage, high efficiency cooling systems, EV parking and dark sky compliant lighting. Additionally, pathways for walking and biking will connect the campus to the existing city recreational trail system.

To mark the event, a \$10,000 digital arts program was donated by Edwards and Dacon to the Boys & Girls Club of Greater Haverhill (BGC). Open since 1900, this civic organization

feeds, teaches and raises more than 250 children every day. Most notably, during the pandemic, BGC provided 20,000 meals and remote learning to 125 students who had no other options. The Edwards Digital Arts Studio is centered on engaging teens while developing technical skills and encouraging career aspirations. Established within BGC’s current facility, the program will be led by a graphic design educator, with teens supplied with MacBooks, drawing implements and bean bag furniture to create a casual learning space of warmth and inclusion “We are grateful to Dacon and Edwards for playing a pivotal role in our efforts to provide quality programs that focus on future career interest opportunities. This program will complement

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our current STEAM program offering and bolster our teen recruitment efforts,” said Javier Bristol, Executive Director, Boys & Girls Club of Greater Haverhill. Lauren Nowicki, Chief Communications Officer, Dacon Corporation said, “BGC plays an integral yet often overlooked role in facilitating productive and safe communities. Their members receive consistent education, encouragement and guidance that navigates them successfully through young adulthood. This is our first Designed with Dignity program tailored to providing teens with technical skills for life.”

Enrollment is on a rotational basis in tandem with curriculum goals and capacity. This program fosters camaraderie and character



*Dacon Corporation has completed a 135,000 SF new headquarters for Edwards Vacuum in Massachusetts.*

building. It inspires talent, stimulating creative and analytical capabilities, while introducing Edwards Vacuum to the

community. The facility currently has 180 teen members. said Congresswoman Lori Trahan, “I am thrilled to welcome Edwards

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## Blower & Vacuum Industry News

Vacuum to the Third District. I'm confident that their commitment to community and environmental stewardship will make them an excellent addition to our district. Edwards is not only expanding our technical and manufacturing sector, but they have proved themselves to be excellent community partners with organizations like the Boys & Girls Club of Greater Haverhill where they already helped strengthen the STEM literacy and digital skills of our students."

### About Edwards

*Edwards is a global leader of vacuum and abatement. We are proud to lead the industry, pushing the boundaries of science to deliver innovative products which are intrinsic to everyday*

*life, working in partnership with our customers and continually setting new standards. At Edwards, we are committed to minimizing the negative environmental impacts of semiconductor manufacturing and we strive to minimize the impact on the natural world and environment we live in now and for our future. Edwards is part of the Atlas Copco Group a Sweden-based provider of industrial productivity solutions. For more information, visit [www.edwardsvacuum.com](http://www.edwardsvacuum.com).*

### Atlas Copco Acquires Korean Cryopump Distributor

Atlas Copco has agreed to acquire the cryopump service and distribution business of ZEUS Co., Ltd. The business provides service and sales distribution for the Vacuum

Technique business area's CTI and Polycold products in South Korea. The seller of the business, ZEUS Co., Ltd (ZEUS), is a company listed on the KOSDAQ Korea Exchange. The business unit that Atlas Copco is acquiring from ZEUS is located in Gyeonggi-do, south of Seoul, and has 59 employees. In 2021, the business had revenues of approximately BKRW 15 (MSEK 119\*).

"We have had a successful relationship with ZEUS since acquiring the CTI business from Brooks in 2019," said Geert Follens, Business Area President Vacuum Technique. "The acquisition will allow us to get even closer to our customers and better serve the semiconductor and flat panel display industry in South Korea."

The CTI and Polycold products are cryogenic vacuum pumps and refrigeration systems used in semiconductor manufacturing and general vacuum applications. The purchase price is not disclosed. The acquisition is subject to regulatory approval and is expected to close during the second quarter of 2023. The business will become part of the Semiconductor Service Division within the Vacuum Technique Business Area, operating under the Edwards brand.

### About Atlas Copco Group

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



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## Chris Hyde Joins Lontra as Head of Commercial

Lontra, manufacturer of revolutionary blower technology Lontra Blade Blower™ with energy savings of up to 34% against comparable units, announced that Chris Hyde has joined the company as Head of Commercial. Chris Hyde, formerly UK and Ireland Sales Manager for Atlas Copco Vacuum, will be responsible for developing distribution channels and accelerating sales of the flagship product, the LP2 Blade Blower, globally with an initial focus on North America.

“Chris has proven capability of developing channels to market and delivering successful

product launches,” said Euan McCullough, Lontra’s Director of Strategic Development. “His success in senior sales roles at both a leading compressor manufacturer and established distributor, stands him in good stead. He brings strong commercial acumen from the compressor, blower and vacuum industries to Lontra, and leadership skills honed by studying an MSc In Executive Business Leadership. Chris will play a key role in creating new sales and marketing strategies to deliver significant revenue growth in the US.”

“I am honored to join Lontra at a pinnacle moment in the company’s history,” said Chris Hyde. “Lontra’s LP2 Blade Blower is a



Chris Hyde, Head of Commercial, Lontra.

paradigm shift to the blower market – there’s nothing else like it out there.”

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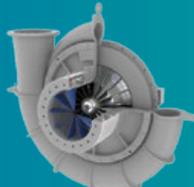
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## Blower & Vacuum Industry News

Hyde said, “The unique advances offered by Lontra’s Blade Blower™, including improved reliability and oil-free application, IoT maintenance, WEG IE5 ultra-premium permanent magnet motor, Yaskawa inverter, and ultimately, increased competitiveness, will be in high demand from distributors and customers alike, seeking to position themselves at the forefront of their industry.

“I look forward to introducing the Blade Blower’s innovative technology to distributors and customers in the wastewater and pneumatic conveying markets,” said Hyde.

Prior to joining Lontra, Hyde was UK and Ireland Sales Manager with responsibility for Atlas Copco Vacuum business. Hyde played a critical role in developing and managing sales channels, successfully launched new products, and sold globally into new industrial markets

### About Lontra

*Lontra is a developer, manufacturer and exporter of a revolutionary blower and compressor technology with application to the wastewater treatment and pneumatic conveying industries. Lontra Blade Blower™ technology is the first clean-sheet blower and compressor design in over 80 years, and used inside the product: LP2 Blade Blower. It has proven energy savings of up to 34 percent against comparable machines of this type thanks to the game-changing technology. Lontra is on the cusp of global scale-up growth. Production at their new smart factory in Doncaster, UK, is ready to take an increased number of orders, as they continue to build a strategic supply chain that it can partner with into the future. To learn more visit [www.Lontra.co.uk](http://www.Lontra.co.uk).*

including CNC machinery, fish farms and paper manufacturing. Prior to this, Hyde was an Energy Consultant at ACE Group, before consecutive promotions to Area Sales Manager and Group Sales Manager for compressors, blowers and vacuum.

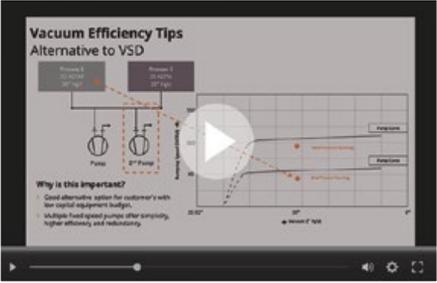
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## Black & Veatch Appoints Sustainability Leadership Role

Black & Veatch, a leading global provider of critical infrastructure solutions, has named industry expert and Senior Vice President Deepa Poduval as Sustainability Leader. In this role, she will advance Black & Veatch's sustainability efforts in alignment with the Ten Principles of the United Nations (UN) Global Compact, the CEO Water Mandate and its Caring for Climate Pledge.

An 18-year veteran of Black & Veatch, Poduval, who also leads Global Advisory for Black & Veatch, will be responsible for continuing to implement the company's Sustainability Strategy while further shaping sustainability as part of the company's next-generation strategy. The company's focus includes work and evaluation of progress towards the environmental, social and governance responsibilities championed by the company's employee-owners, involving issues including carbon emissions, water use, diversity, equity and inclusion, anti-corruption, forced labor, human trafficking and safety.

"As people across the globe gain a better understanding of the importance of sustainability to the preservation of our planet and our future generations, Black & Veatch, as a provider of human-critical infrastructure solutions, plays a critical role in developing solutions that support a greener future with smarter technology, better preservation of natural resources and higher reliance on cleaner sources of energy," said Mario Azar, Chairman and CEO of Black & Veatch. "With Deepa's cross-industry expertise and proven



Deepa Poduval, Sustainability Leader, Black & Veatch.

track record in helping many of our clients develop effective decarbonization strategies, I have great confidence that she and her team of experts will lead our company towards our vision to become the leading global provider of sustainable infrastructure solutions. This starts with making sustainability a major part of our business culture."

Poduval, and the Global Advisory team she leads, partners with a variety of corporate, utility and government clients who seek to develop decarbonization strategies, applying solutions to maximize the benefits of green power, sustainable water solutions, hydrogen technologies and EV charging – among available solutions – to achieve their sustainability, growth and resilience goals.

"In order to create a more sustainable and resilient future, we must act urgently to achieve the positive impact that companies can have on social and climate matters," said Poduval. "I look forward to working with our clients,

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## Blower & Vacuum Industry News

partners and highly motivated professionals, to design innovative and sustainable solutions that accelerate the path to net zero.”

Originally from India, Poduval serves as Executive Sponsor for WAVE, Black & Veatch’s Employee Resource Group (ERG) for women, fostering unique perspectives that benefit the company culture and strive to make the workplace more welcoming to those from different backgrounds. She also serves on the board of directors of the GridWise Alliance working to create a transformed grid to support decarbonization of the U.S. economy.

### About Black & Veatch

*Black & Veatch is a 100-percent employee-owned global engineering, procurement, consulting and construction company with a more than 100-year track record of innovation in sustainable infrastructure. Since 1915, we have helped our clients improve the lives of people around the world by addressing the resilience and reliability of our most important infrastructure assets. Our revenues in 2021 exceeded US \$3.3 billion. Follow us on [www.bv.com](http://www.bv.com).*

### Pfeiffer Vacuum Celebrates Future Asslar Factory Expansion

As one of the global leading suppliers of vacuum technology, Pfeiffer Vacuum celebrated the groundbreaking of a state-of-the-art industrial complex at Berliner Strasse in Asslar. The site expansion known as the “Future Factory Asslar” will be brought to life at the premises of the current Pfeiffer Vacuum company. The aim is to significantly expand the company’s manufacturing and logistics capacities. The centerpiece of the development is the 8,000 square meter logistics center with

an integrated, fully-automated warehouse. A further 1,000 square meters will be used to create an additional production area as well as a service environment, in which all service areas will work together centrally. The new logistics center should be completed in 2024. In addition, part of an existing building will be modernized at the same time.

During the groundbreaking ceremony, Ayla Busch, Supervisory Board Chair of Pfeiffer Vacuum Technology AG, and the Management Board team consisting of Dr. Britta Giesen and Wolfgang Ehrk welcomed the County Chief Executive Wolfgang Schuster and Mayor of Asslar Christian Schwarz.

The company is incorporating photovoltaic systems throughout the project, with the plan to feed the electricity generated into the company’s own power network. Heat generated by the production facilities will also be recovered.

Charging stations for employees’ electric vehicles are also planned. The goal pursued for the site is to achieve climate neutrality by 2030.

### About Pfeiffer Vacuum

*Pfeiffer Vacuum is one of the world’s leading providers of vacuum solutions. In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems. Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products in the analytical, industrial, research & development, semiconductor and future technologies markets. Founded in 1890, Pfeiffer Vacuum is active throughout the world today. The company employs a workforce of more than 3,500 people and has more than 20 sales and service companies as well as 10 manufacturing sites worldwide. For more information, please visit [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com).*



Successful groundbreaking ceremony of the “Future Factory Asslar” by Pfeiffer Vacuum.

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

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

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

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

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

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

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

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

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

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

**SEP 14** **Chiller Selections for Central Plants: Lowest Overall Costs for Process Cooling**  
 Presenter Clayton Penhallegon, Jr., P.E., Integrated Services Group – Sponsored by Carrier  
 Thursday, September 14, 2023 – 2:00PM EST

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

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

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

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



**Loran Circle**  
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**Frank Melch**  
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**Paul Edwards**  
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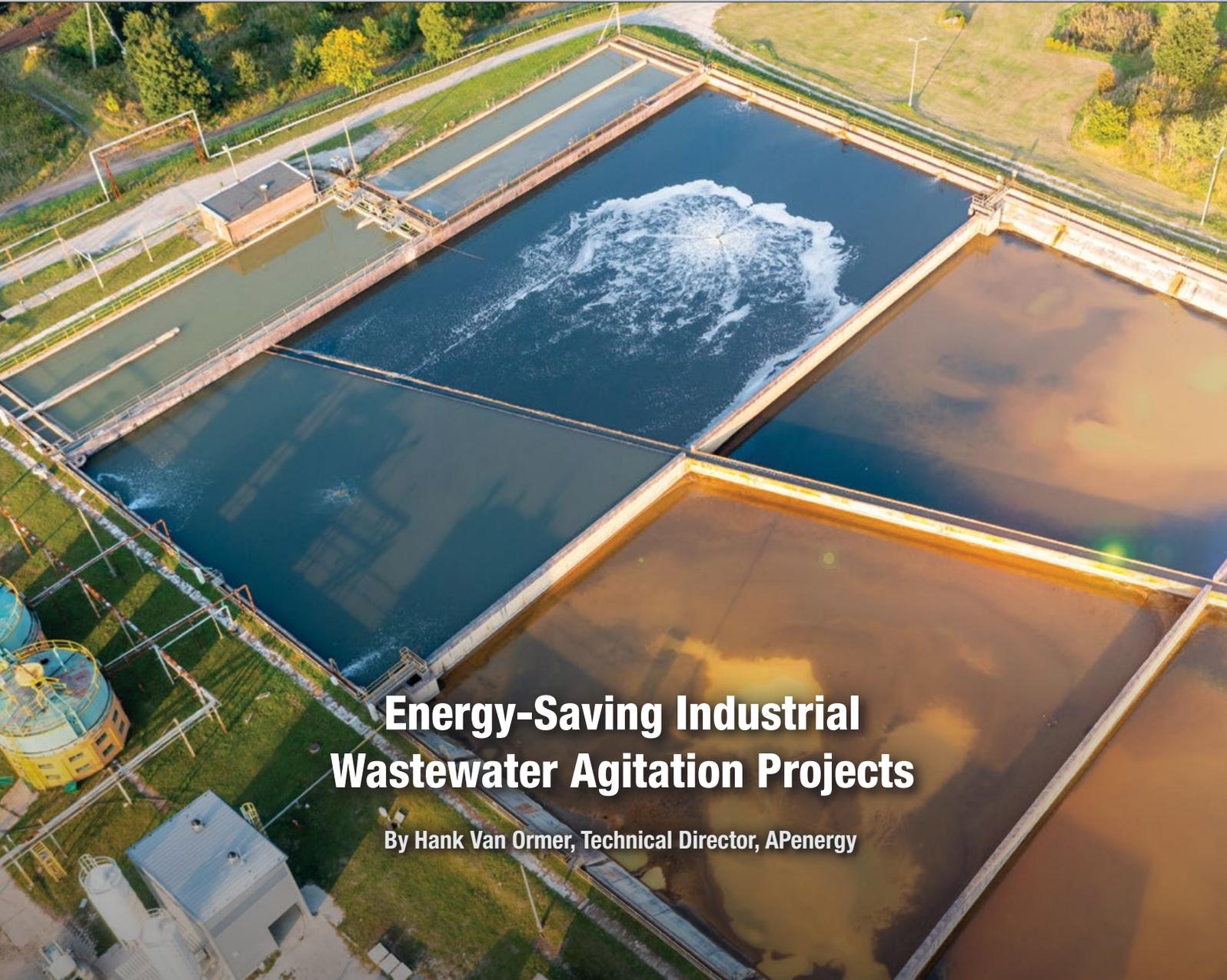
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# Energy-Saving Industrial Wastewater Agitation Projects

By Hank Van Ormer, Technical Director, APenergy

► The objective of this article is to look at typical industrial wastewater agitation processes and share various energy saving compressed air/blower projects that have worked well over the years. These basic fundamentals are a good starting point to begin the evaluation of a project idea.

There are three primary uses of compressed air in all wastewater treatment applications. This article will focus on agitation and movement of materials.

- Aeration to supply the processing bacteria with oxygen support
- Agitation to keep the solids in suspension and,
- A continuous, driving pump to move the material.

## Wastewater Municipal Water & Sewage Treatment

- Compressed air used for agitation to keep solids in suspension
- Compressed air is often needed to supply oxygen support to the processing bacteria

## Air pressure required depends on

- Liquid/slurry depth
- Actual water head pressure 2.31 feet equals 1 psig
- For estimating we use .5 psig per foot of head of H<sub>2</sub>O – specific gravity of water is 1.0. Mixtures and slurries with higher specific gravity will have greater head pressure

**Will Pressure Requirements Allow the Use of a Blower?**

The lower the required pressure, the lower the energy cost, per scfm of delivered volume of compressed air, with the same type and class of compressed air (or blower) operating equipment. This is generally true regardless of the type of compressed air generating unit as long as the pressure flow is within a given machines’ operating parameters.

This sounds somewhat simple – just identify the minimum acceptable pressure that works and the required or current actual compressed air flow being used. Then, select the appropriate blower or air compressor. In an existing plant or operation this can often be challenging since many operators do not have nor know this information.

TABLE 3. TYPICAL OPERATING COST FOR 500 CFM AT VARIOUS PRESSURES (BASED ON \$.06/KWH AND 8,000 HRS/YEAR)		
Electrical Energy Cost to Produce:	500 cfm at 100 psig	\$43,000
	500 cfm at 50 psig	\$26,000
	500 cfm at 15 psig	\$18,000
	500 cfm at 7 psig	\$8,000
	500 cfm at 4 psig	\$5,000

In the field you can measure the flow and inlet pressure, but to accurately estimate the probable lowest usable discharge pressure you will need to know the specific gravity of the solution and the overall height of the liquid or slurry material (depth) to establish the “head pressure” to be overcome.

Unlike a municipal sanitary sewer wastewater treatment facility this data is often not only not readily available but also may well vary over time and application in the industrial wastewater environment.

Generally compressed air is combined with some type of liquid or slurry pump appropriate to handle the material. Often this is an air operated double diaphragm (AODD) pump due to its simple design and versatile application parameters. They are also relatively quick to repair and/or change. Electric driven pumps are often not even considered.

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## Energy-Saving Industrial Wastewater Agitation Projects

### Basic Methods of Aeration / Agitation

When aeration is required for the oxygen supply then the choices (outside of blowers) are somewhat limited. If forced to use 100 psig compressed air, the economic opportunities are:

- Investigate the savings if an electric pump can replace the air driven pump. The primary limiting factors to economic use of an electric in lieu of air driven is the head pressure required (viscosity and depth) and make up of the material.
- If an air operated double diaphragm pump (AODD) is the proper selection,

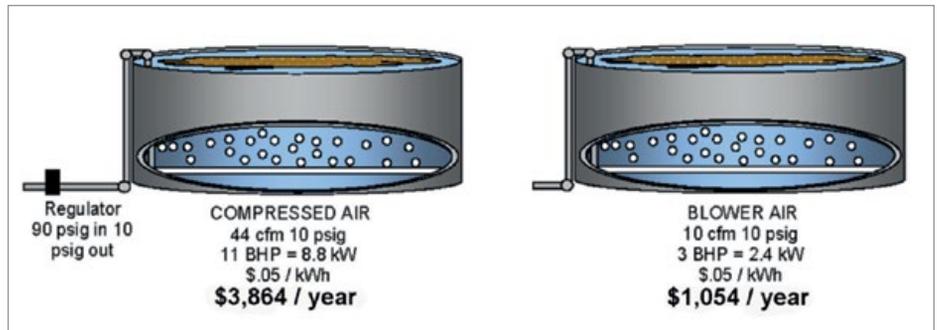


Figure 1.

identify the lowest effective inlet pressure and add an electronic stroke optimizer. These controls can reduce the air use 40 to 50%, delivering the same throughput while incorporating automatic starts/stop if applicable.

- Identify the proper pressure and flow to select the most effective compressed air supply (a blower) as described earlier.

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**Agitation**

When compressed air is used (with or without a process pump) primarily for agitation, additional opportunities exist to deliver the same agitation results at a lower energy cost. Even though compressed air power is very expensive, these other actions should always be carefully evaluated on specific case by case conditions to establish an accurate operation energy cost.

**Liquid Flow Educators Replace Agitation Air at a Refinery**

The principle of operation of a Liquid Flow Educator is that liquid is pumped into the educator nozzles and exits at high velocity,

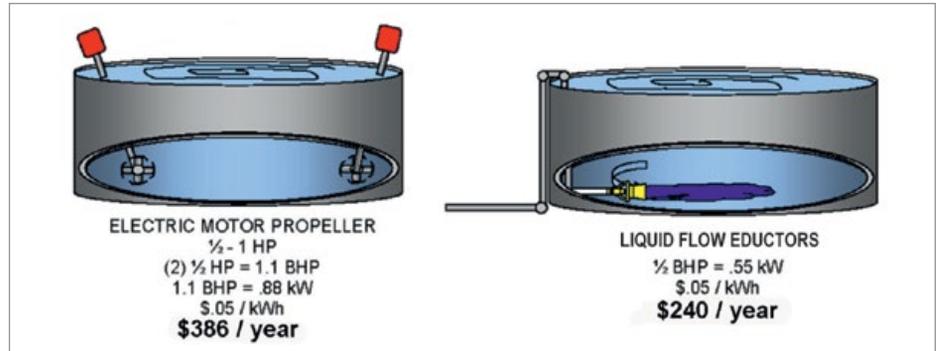


Figure 2.

drawing an additional flow of the surrounding solution through the educator. This additional flow (induced liquid) mixes with the pumped solution and multiplies its volume five-fold. The source of the pumped liquid (input) can be a pump or filter chamber discharge.

Eductor agitation delivers five times the pump output at each nozzle. This effectively helps deliver the required level of agitation to critical areas. When appropriate and properly engineered and installed, this can often supply proper agitation at lower energy input.

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## Energy-Saving Industrial Wastewater Agitation Projects

### Agitation Project at a Chlorine Plant

A chlorine plant had two 40 foot tall wastewater final stage polishing tanks used to treat the wastewater before releasing to groundwater (fluid depth 30 feet). The application used 220 scfm of compressed air at 90 psig, which was regulated down to 15 psig to supply agitation to maintain clarity. The air was delivered to the bottom of each tank from which it bubbled up through the water.

The first alternate technology considered was utilizing the “liquid flow eductors”. However, the power to handle this tall and wide tank was 75 hp (62 kW) which was obviously not a calculated savings so the idea was abandoned.

Supplying the low-pressure air at 16 psig with a single-stage helical lobe blower was next explored.

A helical lobe blower using a 25 hp electric motor with 22 bhp power draw ( $22 \times .746 \div 90 = 18.2$  input kW) will deliver 239 scfm at 15 psig. With this, the primary estimated annual energy cost is \$15,944/yr ( $18.2 \times \$1.10$ /

Estimated Energy Use 240 scfm at estimated 4 scfm per input hp at 100 psig	60-hp
Electric motor driven pump	20-hp
Total energy	80-hp (66.3 kW)
Estimated annual current electrical energy cost ( $80 \times .746 \div .90 @ \$0.06 \text{ kWh} / 8,760 \text{ hrs/yr}$ )	\$34,847/yr
New Energy Use	8 kW
Total electric power operational savings (kW)	58.3 kW
Estimated annual total electric energy savings ( $$.06 \text{ kWh} / 8,760 \text{ hrs/yr}$ )	\$30,642
Total project cost (with installation)	\$20,000
Simple payback	7.8 months

At a refinery, the caustic production utilized two 40' tall tanks with 15' depth. Measured air flow was 240 scfm to both wastewater holding tanks. The air was delivered through three 3/4" lines on three sides of the holding tank. The blowing air was able to keep the solids off the inside walls. There was also a 20 horsepower pump that continually circulates the mixture to keep the solids off the bottom and in suspension.

The project implemented consisted of installing three eductor patterns at appropriate points on the tank walls and a double set on the bottom. The new eductor system held the solids in suspension as required allowing appropriate storage time between cleaning and clearing. The total energy input requirements, of the liquid flow eductors, consisted of the use of a 10 horsepower (8 kW) duplex centrifugal pump.

### Filter Press at a Steel Processing Plant

A filter press, at a steel processing plant, was running an air operated double diaphragm pump (AODD) during a complete four-hour cycle. The filter press would run for a four-hour

cycle with a 30 minute final press requiring 150 feet of head pressure at the end of each cycle. Prior to the final press, head pressure is 30 to 40 feet for 3.5 hours per cycle.

The project was to install a 2-hp electric motor driven centrifugal water pump to complement the AODD to operate the press the first 3.5 hours of the 4-hour cycle. The AODD will now run the last half hour of each cycle. The production process runs 24 hours a day, 7 days a week, 365 days a year with a blended power rate of \$.10 kWh.

Current air flow to 2" AODD	80 scfm
80 scfm at 90 psig at estimated input power ( $20 \text{ hp} \times .746 \div .90$ )	16.6 kW
Estimated annual electrical energy cost ( $16.6 \text{ kW} \times \$1.10 \text{ kWh} \times 8,760$ )	\$14,542/yr

### Modified Operation

AODD: $16.6 \text{ kW} \times 12.5\% (1,095 \text{ hours out of } 8,760) \times \$1.10 \text{ kWh}$	\$1,817.70/yr
Centrifugal pump: $1.7 \text{ kW} (2\text{-hp motor}) \times 7,665 \text{ hrs/yr} \times \$1.10 \text{ kWh}$	\$1,303.05/yr
Total estimated annual operating air	\$3,120.75/yr
Total annual savings	\$11,421.25/yr
Total project cost	\$5,000
Simple payback	5.3 months

Estimated electric power to produce the 220 scfm at 4 cfm per input hp	55 hp
Estimated electric power x .746 ÷ 90	45.6 kW
Operating cost (8,760 hrs @ \$.10 kWh)	\$39,945/yr

kWh x 8,760 hrs) or an annual electrical energy savings of \$24,000/yr. The installed cost of the new blower package and piping was \$14,000 (up to \$28,000 depending on the package). This provided an anticipated simple payback of 7 to 12 months.

**Steel Mill Wastewater Agitation Project**

The last case study example is in a steel mill’s wastewater treatment area where the limestone slurry tank is agitated with a 30 hp progressive Moyno cavity pump in a 12 foot tall by 8 foot diameter tank. The lime must be effectively kept in suspension to avoid channeling with solids buildup around the pump entry blocking effective agitation.

The solids can block the recirculation volume, which accelerates the fouling factor and significantly increases the number of expensive cleanings. This can be a significant environmental and time-consuming issue to clean out. This situation is in all probability also affecting production.

The goal was to keep the solids in suspension until the regular scheduled maintenance time.



Figure 3.

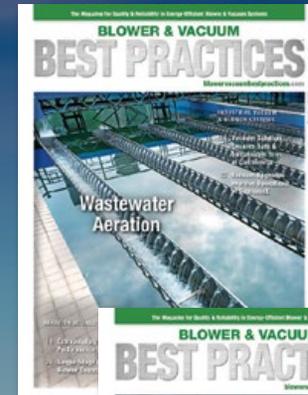
Premature fouling was currently avoided by adjusting fluid tank levels as required when maintenance personnel found time. This situation was not only troublesome but could lead to unplanned significant downtime with the current manpower situation.

After the tank was cleared of solids and reset to avoid a reoccurrence, a 3/4" air line at 90 psig entry pressure was opened into the bottom side of the tank. The measured flow was 80 scfm, it did do the job.

Total estimated pump power (30-hp [x .746 ÷ 90])	24.9 kW
Total air flow 80 scfm (80 ÷ 4 sec/input hp = 20-hp x .746 + .9)	16.6 kW
Total estimated power utilized (8,760 operating hours/yr @ \$.10/kWh)	41.5 kW
Total current estimated electrical operating energy cost	\$36,354/yr

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## Energy-Saving Industrial Wastewater Agitation Projects

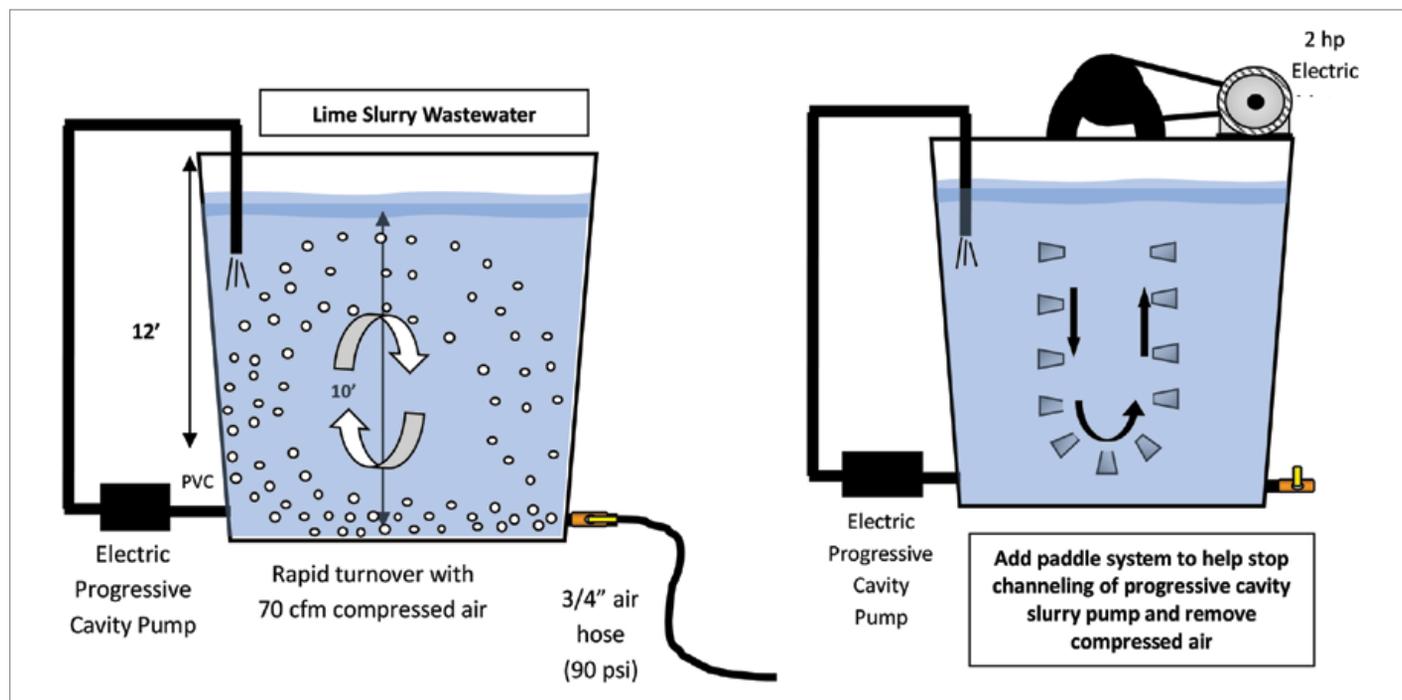


Figure 4.

A mechanical mixing assist with paddles was added to replace the 1" air line (see Figure 4). This arrangement was driven by a 2-hp electric motor ( $2\text{-hp} \times .746 \div .85$ ) or 1.75 kW. This has proven to be very successful.

### Summary

If air is needed for the wastewater treatment process and agitation alone is not enough, then there are really two choices – blower air or air compressor air. The proper choice will have a very positive impact on energy costs and correctly applied and maintained, should enhance productivity.

The second opportunity is pump selection – electric or air driven. With or without flow enhancers like liquid flow eductors, if air operated, the use of microprocessor stroke optimized controls on AODD pumps should be considered.

New configuration electrical operating energy:	
30-hp progressive cavity pump	24.9 kW
Mechanical paddle pump	1.75 kW
Total electrical operating energy power	26.65 kW
Total electrical operating annual energy cost	\$23,345/yr
Total electrical energy savings	\$13,009/yr
Cost of project	\$2,540
Simple payback	2.3 months

If only agitation is required, it is usually to keep solids in suspension, and then there are a range of options to replace or reduce compressed air usage including such mechanical devices as propellers, paddles, etc.

As you look at your industrial wastewater system, let your imagination be your guide. As they say, “think outside the box”. **BP**

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# Six Steps to a Tailor-Made Vacuum Solution

By Fabian Falbusch, Head of Content Marketing, Busch Vacuum Solutions



*The Port of Gothenburg, Sweden, required a tailor-made vacuum solution to minimize the amount of hydrocarbon vapors that can be released into the atmosphere during the loading and unloading of tanker vessels. Photo Source: Mikael-stock.adobe.com*

► Vacuum has the ability to significantly improve manufacturing. Using a vacuum system solution in the right context and for the right reason can dramatically change costs, effectiveness, and sustainability as they relate to manufacturing – because using one vacuum pump alone is often not enough.

Tailor-made vacuum systems and modular systems can provide the right solution for individual process requirements – from initial analysis to design, from installation to subsequent top-quality service.

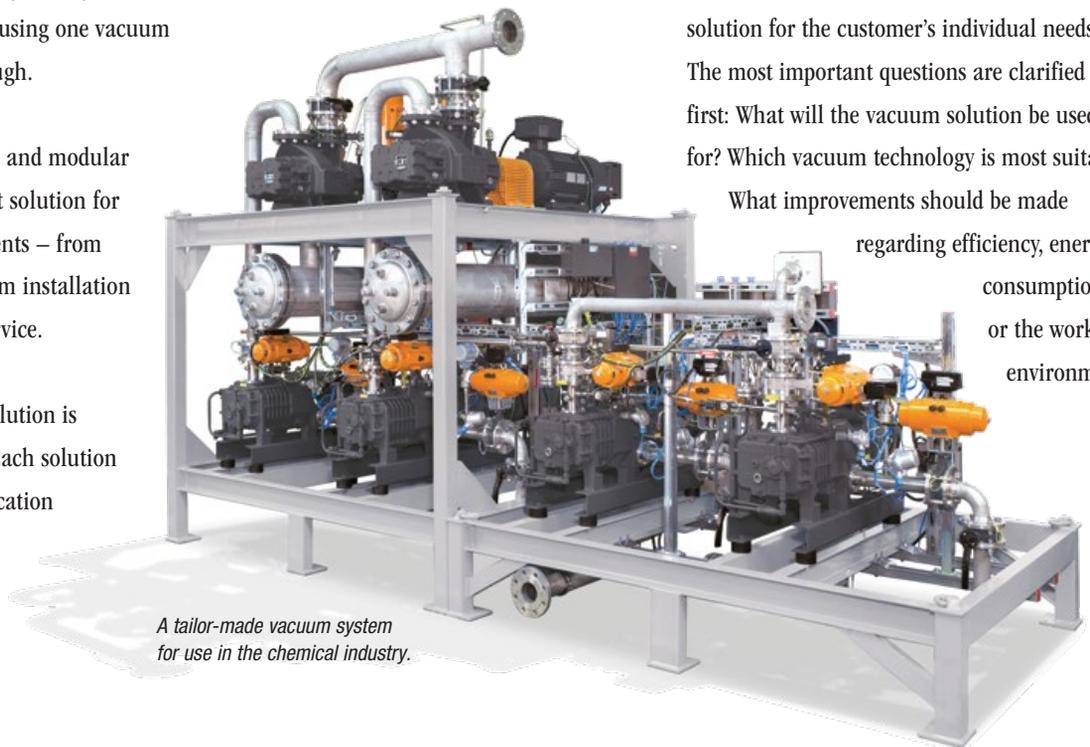
Building a vacuum system solution is always a joint undertaking. Each solution aims to be compliant with location regulations, as well as to be reliable, energy-saving, sustainable and economical. An essential

part of the process is including the customer and their requests during the planning process. There are six steps to find the optimum vacuum solution for the respective application.

## Step 1: Consultation and Analysis

This important initial step is to examine and understand the customer's challenges and expectations. A vacuum expert collaborates with the customer on site to discover the best solution for the customer's individual needs. The most important questions are clarified first: What will the vacuum solution be used for? Which vacuum technology is most suitable?

What improvements should be made regarding efficiency, energy consumption or the work environment?



*A tailor-made vacuum system for use in the chemical industry.*



A modular centralized vacuum system solution makes it possible to generate significant savings when it comes to energy and maintenance costs.

**Step 2: Design and Quotation**

After discussions with the customer, the local technicians draft an initial overall concept. This concept creates the framework for designing and building the future vacuum system. The process takes many factors into consideration, among other things, the local conditions, compliance, safety, performance, and easy operability. A clear and comprehensive quotation for the tailor-made vacuum solution is then drawn up based on this concept.

**Step 3: Manufacture and Installation**

The vacuum system solution will be built in one of Busch’s local systems building centers. The global network of experts provides support during this stage. Once the system has been built, it is then installed. This means not only delivering it, but also having local service engineers integrate it into the customer’s ongoing production processes and connecting

it to the piping system. Once installed, we will verify tightness, proper functionality, and conformity. We also perform necessary test runs and final start-up.

**Step 4: Training**

Training is a vital component. The vacuum experts will fully train staff on site to guarantee safe and reliable operation of the new vacuum system. They will learn how to maintain maximum performance.

**Step 5: Service**

The new vacuum system solution is now fully operational and can be run by the trained staff. Service ensures that things will stay that way in the long term, too – with preventive maintenance. This is handled on site or with remote support via digital services. Customer service always supports customers and with all potential issues or errors.

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## Six Steps to a Tailor-Made Vacuum Solution

### Port of Gothenburg Deploys Safe and Environmentally-Friendly Tanker Loading/Unloading

With 130 direct services to destinations in Europe, Asia, the Middle East, Africa and North America, the Port of Gothenburg is the biggest in Scandinavia and the gateway to the world for a large part of Swedish industry. More than 11,000 ships call at the port every year, including many tankers. The aim during the loading and unloading of tankers is to prevent hydrocarbon vapors from escaping. This is where a tailor-made vacuum solution comes into play: in a vapor recovery unit that captures hydrocarbons.

The Port of Gothenburg is classified as one of the world's greenest ports. It is actively working to minimize the impact of maritime

operations on the environment and to contribute to sustainable transportation. For this reason, the Port of Gothenburg takes extra precautions to minimize the amount of hydrocarbon vapors that could be released into the atmosphere during the loading and unloading of tankers. This is achieved through vapor recovery.

Vapor recovery is the adsorption of hydrocarbon vapors using activated carbon regenerated under vacuum. The vacuum unit collects the vapors that would otherwise be released into the atmosphere. The vapor is turned into liquid and returned to the transport tank of the ship. In addition to the main objective of avoiding emissions, vapor recovery is also used for safety reasons and to prevent major fuel losses.

The vacuum pump previously used in the vapor recovery unit at the Port of Gothenburg was very old and needed maintenance. However, spare parts were no longer available, and the port's managers were looking for a better solution for vapor recovery during the loading and unloading of the tankers. Since the unit is in permanent and daily use, a replacement had to be found as soon as possible. The vacuum experts from Busch recommended a DOLPHIN liquid ring vacuum pump. Thanks to their preparation and support, the old vacuum pump was removed, and the DOLPHIN was installed in the vacuum unit. The changeover took place within two days from stop to restart.

The new vacuum solution has a larger capacity. Therefore, it ensures better recovery of hydrocarbon vapors and, thus, better protection of the environment. The process is highly reliable for the Port of Gothenburg and the loaded and unloaded tankers. The new DOLPHIN liquid ring vacuum pump even showed another benefit when in operation. It is significantly quieter than the previous solution. This makes working close to the vapor recovery unit much more comfortable for the employees. The customer is very satisfied with the new vacuum solutions and informed that it works perfectly and is more efficient than the previous one. The tankers can now be loaded and unloaded in a safe and environmentally friendly manner.



*The tailor-made DOLPHIN liquid ring vacuum system solution installed in the vapor recovery unit at the Port of Gothenburg, Sweden. Source: Busch Sweden.*



**Step 6: Customer Satisfaction**

A fully functional vacuum system ensures seamless production processes and customer satisfaction. Premium customer service provides process reliability and planning security.

A tailor-made vacuum system solution is sustainable and will also continue to adapt to future process requirements. **BP**

*About Busch Vacuum Pumps and Systems*

*Busch Vacuum Pumps and Systems is one of the largest manufacturers of vacuum pumps, blowers and compressors in the world. Our products are at the forefront of vacuum and low-pressure technology. For more information visit [www.buschvacuum.com](http://www.buschvacuum.com). All images courtesy of Busch Vacuum Pumps and Systems.*

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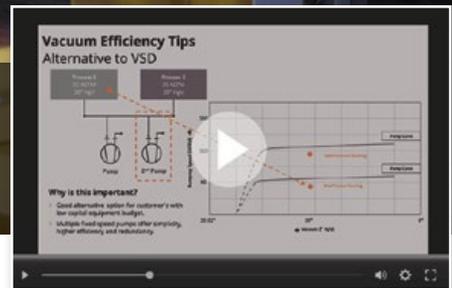
Standard vacuum systems are the perfect choice if a cost-effective vacuum generation concept is needed for a production process.



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# Blower & Vacuum Technology News

## Kaishan USA Launches New Industrial Vacuum Pump

Kaishan USA, a leading worldwide manufacturer of industrial air compressors, has introduced a new series of industrial vacuum pumps, the KRSV. The new Kaishan KRSV oil-flooded rotary screw vacuum pumps are fully packaged, out-of-the-box ready to be plugged into any system or operate independently. Featuring a combination variable speed drive and variable discharge port a/rend, the vacuum pumps are universally applicable and an industry leader in energy efficiency.

Whereas most vacuum manufacturers utilize a fixed port, which means these systems operate at a static volume ratio, a variable discharge port enables Kaishan KRSV vacuum pumps to ensure the proper volume ratio at all ranges and demands, delivering stable, optimal control for the most energy savings. From woodworking, printing, glass production

and ceramics to medical and laboratory applications, the KRSV can improve a wide range of industrial processes while reducing both maintenance and electrical costs.

“Our engineers have been diligently working on this product for over two years,” said Henry Phillips, marketing manager, of Kaishan USA. “We are proud to deliver a universal vacuum solution that leverages our expertise in rotary screw compressor technology to give customers peace of mind in reliability and total cost of ownership.”

For more information about Kaishan USA’s industrial vacuum pumps, please visit <https://kaishanusa.com/industrial-vacuum-pumps/>.

### About Kaishan USA

*Kaishan USA engineers the highest quality rotary screw air compressors that enable us to build a better, more efficient future. We streamline our*

*operations by taking direct ownership of 85% of our product content. This process enables us to vigorously control the cost and caliber of our equipment while improving its energy efficiency and safe use. Our solutions range from 5-600 horsepower and are used in a variety of industries. Based in Loxley, Alabama, our new 65,000-square-foot, state-of-the-art manufacturing facility fully stocks over 300 finished units and aftermarket parts that serve customers around the world. We are a proud American manufacturer, with military veterans comprising more than 20% of our staff. To learn more, please visit [www.kaishanusa.com](http://www.kaishanusa.com).*

## Dekker Expands Product Line with Gryphon Dry Claw Pumps

With a reputation in the industry for manufacturing rugged and reliable vacuum solutions, Dekker Vacuum Technologies’ is excited to announce the Gryphon dry claw vacuum pumps as the newest addition to its extensive portfolio of industrial vacuum pumps. Expertly engineered and built for exceptional performance in harsh environments, the Gryphon dry claw pump series is the ideal pump of choice for plastic extrusion, woodworking, medical, thermoforming, conveying, and material handling. While simple in design, this plug-and-play solution comes packed with innovative features that make it more durable, easy to service, facility friendly, and efficient than its competition.

Designed and manufactured with superior construction materials and stainless-steel corrosion resistant coatings, the Gryphon’s durable build ensures longevity of the pump and industry leading performance. Depending



The new Kaishan KRSV oil-flooded rotary screw vacuum pump.



*Gryphon dry claw pump series is the ideal pump of choice for plastic extrusion, woodworking, medical, thermoforming, conveying, and material handling.*

on the application process, space can be limited, and employees find themselves in close proximity to the vacuum pump. Part of the innovative design of the Gryphon dry claw vacuum pump is its compact design and lower noise levels, making for an all-around improved working environment. While its facility friendly design is sure to be popular feature, its serviceability makes it even more desirable. If and when the Gryphon requires routine service or repair, the dry claw pump is engineered for easy maintenance. Long life bearings and seals, a separate and isolated pumping element, and the simplest of designs suited for quick access to the pumping chamber makes for easy cleaning in the event of product carry-over. All expertly designed for swift repair and service to minimize potential downtime.

So where other vacuum pump solutions might fall short, the Gryphon dry claw vacuum pump is equipped with everything needed to excel in improving the efficiency of applications and the quality of the end product. From its robust plug-and-play design to its ease of serviceability, the Gryphon dry claw pump series is ready to be put to the test.

#### **About Dekker Vacuum Technologies**

*Dekker Vacuum Technologies, based in Michigan City, Indiana, is an industry leader in the manufacturing of tough and reliable vacuum solutions. The vacuum solutions designed and built at Dekker play a critical role in the demanding manufacturing processes like those in woodworking, food processing, medical, plastics and power generation. Backed by service and support you*

*can always count on, Dekker's desire to exceed expectations is built into every vacuum product and is easily recognizable in the service and support after the sale. Dekker Vacuum Technology employees are proud to have earned the reputation of being – Dedicated. Dependable. Dynamic. Dekker. To learn more about the newest editions to the Dekker® Gryphon® series, visit the product page for more details: <https://www.dekkervacuum.com/store/?cid=gryphon-oil-free-claw-vacuum-pumps>*

#### **Pfeiffer Vacuum Introduces AccessLink for HiScroll® Series Pumps**

The HiScroll series from Pfeiffer Vacuum consists of three dry and hermetically sealed scroll pumps with a nominal pumping speed of 6 – 20 m<sup>3</sup>/h. These vacuum pumps are characterized not only by their high performance when evacuating against atmosphere but also by their very high energy efficiency that reduces their carbon footprint.

Pfeiffer Vacuum is now introducing its intelligent new accessory interface AccessLink, which permits the use of a wide range of optional accessories. Its presence is automatically detected by the HiScroll's electronics. Before this, accessories had to be configured by hand. A uniform accessory interface of this kind enhances convenience and safety during operation.

A new gas ballast valve detects the specific process requirements automatically. The valve is controlled by the vacuum pump, either according to a specific time interval

## Blower & Vacuum Technology News

or depending on the inlet pressure, in conjunction with an additional accessory, the HiScroll integrated sensor RPT 010, which is available exclusively from Pfeiffer Vacuum. The automatic gas ballast valve can also be switched manually by a higher-level controller connected to the HiScroll or by the Pfeiffer Vacuum OmniControl.

The operating reliability is enhanced by the new vacuum safety valves. These valves prevent a pressure rise at the vacuum flange when the pump is switched off. This brings a notable increase in safety, particularly in the case of power outages. It also prevents any backflow into the vacuum chamber,

including in the form of residual gas that may be present in the pump system. Delayed opening when the HiScroll starts up prevents a pressure surge towards the vacuum side, and this is particularly advantageous for high vacuum systems operated in combination with turbomolecular pumps, such as the Pfeiffer Vacuum HiPace.

The optional integral RPT 010 vacuum gauge ensures fully automatic pressure control. This minimizes pump wear and extends the maintenance intervals, while lowering electricity use and reducing the carbon footprint of the HiScroll.



*Pfeiffer Vacuum scroll pumps from the HiScroll series.*

As Fabian Böcher, product manager at Pfeiffer Vacuum, said, “Proven Pfeiffer Vacuum quality, combined with the new accessories,

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ensures a long lifetime and reduces operating costs and the environmental impact. Easy pump maintenance makes for shorter service times and maximum availability. Its safe operation is guaranteed by the integrated safety valve at the outlet and the self-regulating operation of the pump.”

With these properties, HiScroll vacuum pumps are able to embrace numerous applications in the field of analytics, biomedicine, pharmaceuticals and research & development. These pumps are used in mass spectrometry, electron microscopy and surface analysis as well as in accelerators and laboratory applications, and are also found in semiconductor technology, coating or gas recovery.

#### About Pfeiffer Vacuum

*Pfeiffer Vacuum is one of the world's leading providers of vacuum solutions. In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems. Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products in the analytical, industrial, research & development, semiconductor and future technologies markets. Founded in 1890, Pfeiffer Vacuum is active throughout the world today. The company employs a workforce of more than 3,500 people and has more than 20 sales and service companies as well as 10 manufacturing sites worldwide. For more information, please visit [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com).*

### ABB Expands its Family of Baldor-Reliance EC Titanium Motors

ABB, a global technology leader in electrification and automation, has added IEC frame options to its integrated motor-drive offering of Baldor-Reliance EC Titanium motors. Standard features include aluminum housed top-mount of axial mount integrated drive, IP55 enclosure, internal shaft grounding brush and class-F insulation. EC Titanium motors are rated for inverter use per IEC 60034-18-41. The IEC integrated motor drive can operate as a top-mount drive in ratings of 1 to 10 HP (0.75 – 7.5 kW), or axial-mount drive in ratings 1 to 7.5 HP (0.75 – 5.5 kW.)

EC Titanium motors incorporate a highly efficient rotor technology, and when paired with ABB's ACH580 variable speed drive, the platform provides a superior and sustainable solution for fan arrays in HVAC applications. With the patent-pending simple firmware update, a single new or installed ACH580 drive can operate as many as 16 EC Titanium motors, saving significant space and component costs. ACH580-01 drives produce exceptionally low harmonic content and exceed requirements set by low harmonic standards, making these the ideal drive to control EC Titanium motors. Lower harmonics and full motor voltage at all times mean reduced system losses, better overall system efficiency, higher reliability and extended equipment life.

EC Titanium is also available in a plenum-use design which replaces plastic external parts with aluminum to reduce the risk of fire hazards and noxious fumes in environmental air spaces. Bluetooth capability is removed from the plenum-use integrated motor-drive model, a requirement for certain applications, such as data centers, which prohibit broadcast communications.

Baldor-Reliance EC Titanium combines synchronous reluctance and permanent magnet technologies for the most efficient motor available in the market today. The rotor design incorporates no rare earth elements, resulting in a motor solution that is highly efficient, quiet, reliable and easy to operate – all in an eco-friendly package.

EC Titanium is offered in two styles: stand-alone motors and integrated motor-drive units, both



ABB expands its family of award-winning, ultra-efficient, Baldor-Reliance EC Titanium Motors.

## Blower & Vacuum Technology News

of which exceed the IE5 efficiency level. They offer excellent performance across a wide speed load range and above base speed conditions. Additionally, the integrated motor-drive solution saves considerable control panel space and reduces wiring costs by placing the drive on top of or on the opposite drive end of the motor.

### About ABB

*ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 105,000 talented employees in over 100 countries. For more information, visit [www.abb.com](http://www.abb.com).*

### VAC-U-MAX Offers Signature Series™ Vacuum Receivers

VAC-U-MAX Signature Series™ provides processors a quick and easy solution to convey many types of powders and bulk solids, from handfuls to 3,500 pounds per hour. Each unit consists of 5 parts: a vacuum receiver

(stand or sanitary design), a pick-up nozzle, convey tubing, vacuum producer, and UL-listed controls. Signature Series™ vacuum receivers feature static conductive filters and pulse filter cleaning for continuous “keep clean” filters, maximizing system performance, plant and personnel safety, and overall plant hygiene. VAC-U-MAX Signature Series is designed with four airflow options including single or twin-jet venturi power units which operate using compressed air, positive displacement pumps for dilute and semi-dilute applications, high vacuum pumps for dense phase conveying, and regenerative blowers that offer lower vacuum at higher airflow and are ideal for conveying granular or pelleted product. Various finishes and discharge types are available.

### About VAC-U-MAX

*Since 1954, VAC-U-MAX has been a worldwide leader in the design and manufacture of bulk material handling systems incorporating pneumatic, aero-mechanical, and flexible screw conveying technologies. Product line includes a full range of custom and pre-engineered vacuum receivers, bad dump stations, bulk bag unloading systems, mobile vacuum conveying systems, ColumnLift™ systems,*

*batch weighing systems and more. Product range also includes portable, continuous duty and central vacuum cleaning systems, with combustible dust vacuum cleaners operating on compressed air. For more information and RFQ visit [www.vac-u-max.com](http://www.vac-u-max.com).*

### Coval Launches CMS HD VX Multistage Vacuum Pumps

After the launch in 2022 of the CMS HD series of multistage vacuum pumps, COVAL is completing its offer with the VX range, a version with embedded intelligence. It has the design pedigree of COVAL's vacuum pump ranges, which combine operating power, robustness, modularity, compactness and communication. The multi-stage vacuum generation technology ensures that the CMS HD VX vacuum pumps have a high suction flow rate, up to 1600 NI/min, as well as silent operation and reduced air consumption. They are particularly suitable for handling porous parts, such as cardboard boxes, or emptying large-volume tanks.

The heavy-duty design offers high resistance and a long service life even in the harsh environments (dust, oil, humidity) typical of production lines. The CMS HD VX pumps are extremely robust, with an IP65 protection rating and a service life of 50 million cycles. A contributing factor to their longevity is their modular design which allows specific configurations and targeted maintenance of specific parts to optimize the rate of reparability.

The principal enhancements to the CMS HD VX multistage vacuum pumps provide a more ergonomic user interface and permanent communication with the operations environment. The CMS HD VX multistage



*Signature Series Vacuum Receivers available in 1500 Series for conveying from handfuls to 1,500 lbs/hr (680 kg/hr), and 3500 Series for conveying rates up to 3,500 lbs/hr (1600 kg/hr). Custom units are available for conveying up to 25,000 lbs/hr (11,000 kg/hr).*

pumps are thus fully connected to Industry 4.0. Above all, the design of the Human Machine Interface (HMI) has been designed with particular care, to improve information to the operator and help them react to problems more efficiently. To better facilitate operation, diagnosis and maintenance, users can more easily read and understand the status and take the appropriate actions. The 1.54" color LCD display is intuitive, with clear messages in 5 languages.

The IO-Link communication interface, which complies with the international standard IEC 61131-9, makes the CMS HD VX vacuum pump



*New CMS HD VX multistage vacuum pumps from COVAL, with added intelligence and communications capability.*

 An aerial photograph of a wastewater treatment plant. Several large rectangular aeration basins are visible, filled with blue water and equipped with mechanical aerators. There are also circular clarifiers and other structures. The surrounding area includes green grass and some buildings.
 

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### The Magazine for Sustainable, Safe and Reliable Blower & Vacuum Systems

Blower & Vacuum Best Practices is part of a family of magazines dedicated to **Sustainable, Safe and Reliable On-Site Utilities Powering Automation**. This is a technical magazine, reaching 14,500 subscribers, who are dedicated to optimizing industrial blower and vacuum systems and municipal wastewater aeration blower systems.

#### Industrial Blower & Vacuum Systems

Highly targeted manufacturing and process industry readers optimize the use of industrial blowers and vacuum pumps. These readers work together with sales engineers from industrial distributors of blowers and vacuum pumps prepared to provide "Best Practice" advice. The projects include replacing compressed air with blowers for pneumatic conveying, centralizing vacuum systems, replacing liquid ring with dry vacuum pumps and deploying VSD technology to match load with demand.

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

— Jasmin Markanic and Uli Merkel, Busch Vacuum Solutions

#### Aeration Blower Systems

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

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

— Tom Jenkins, JenTech Inc.

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easy to use and allows for fast and cost-effective installation, continuous diagnostics, centralized parameterization and efficient communication with higher-level protocols (EtherNet/IP, PROFINET, EtherCAT, etc.). All parameterization and diagnostic functions are available and modifiable on mobile devices (Android and IOS) thanks to NFC technology and the dedicated COVAL Vacuum Manager application. This pairing makes it easy to copy parameters from one pump to another and makes it possible to store up to 5 different parameter configurations. The application also allows the user to benefit from technical support from COVAL experts at any time, based on the data transmitted.

### About COVAL

Established in the south of France, COVAL SAS designs, produces and markets high-performance vacuum 1/2 components and systems throughout the entire world for industrial applications in all lines of business. COVAL is an ISO 9001 V2015 certified company that innovates on a global scale in the area of vacuum handling using optimized components with integrated, intelligent and reliable features. Its solutions can be adapted to any industrial context and their primary goal is to improve productivity with safety in mind. COVAL's clients are present in all major industrial fields in which vacuum handling is critical for efficiency and productivity. These fields include packaging, automotive, plastic processing, aeronautics, and palletizing. COVAL markets its products and services throughout Europe as well as in North and South America through its subsidiaries and its network of authorized distributors. For more information, visit [www.coval-inc.com](http://www.coval-inc.com).

### Piab Introduces piCOMPACT®10X SMART

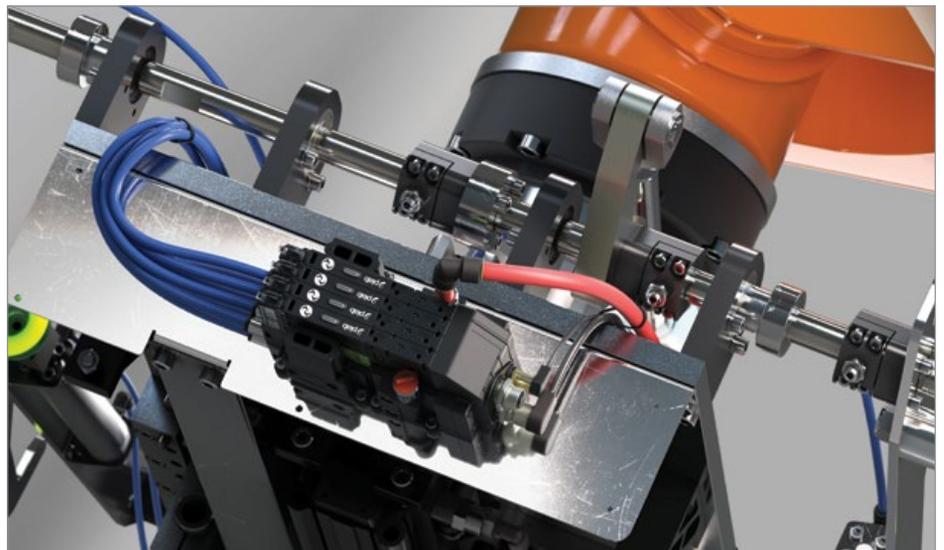
piCOMPACT®10X SMART is a compact, efficient, and intelligent ejector that enables you to take the next step in production control and ease of use. Based on COAX® technology and integrated IO-Link technology, piCOMPACT®10X SMART offers enhanced flexibility, quicker installation, and improved customization to fit your needs.

Building on the air-driven, multistage ejector piCOMPACT®10X, it comes with integrated controls such as on/off valve, blow-off valve, vacuum switch, and energy-saving function, and is built on a configurable platform, making it easy to customize. The upgraded SMART version piCOMPACT®10X SMART also includes smart features that enable predictive maintenance in addition to special preventive features like Leakage Warning, Performance Monitoring Timers, and Vacuum Cycle Counter.

piCOMPACT®10X SMART is perfect for advanced packaging applications within industries such as pharma and electronics, helping producers to quickly and easily realize complex, yet tidy, smart systems.

### About Piab

Piab is evolving automation through progressive gripping, lifting, and moving solutions and has done so since 1951. We believe in an automated world where no resources are wasted, and no humans are injured. With annual sales of ~1.9 billion SEK, 900 employees and a global presence in more than 100 countries, we help our customers improve their operations for the better on a daily basis. Since 2018, Piab is owned by Patricia Industries, part of Investor AB. Evolving ourselves. Evolving you. Evolving automation. For more information, visit [www.piab.com](http://www.piab.com).



piCOMPACT®10X SMART adds functionality to a small footprint ejector.

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