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March 2023

## Cheese Packaging

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## INDUSTRIAL VACUUM & BLOWER SYSTEMS

### 16 Hygienic Vacuum Packaging for Cheese

By Allen Fletcher, Busch Vacuum Solutions



## AERATION BLOWER SYSTEMS

### 20 Design Tips for Aeration Blower Rooms

By Tom Jenkins, JenTech Inc.

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# From the Editor



## Industrial Vacuum & Blower Systems

Allen Fletcher, the Business Development Manager-Food Market, for Busch Vacuum Systems has sent us an excellent article titled, “Hygienic Vacuum Packaging for Cheese.” His article provides excellent detail on the difference between creating an air-tight seal for cheese and protective gas packaging (a mix of carbon dioxide (CO<sub>2</sub>) and nitrogen (N<sub>2</sub>)).

## Aeration Blower Systems

Tom Jenkins, from JenTech Inc., digs into a very practical topic with his article titled, “Design Tips for Aeration Blower Rooms.” This is a must-read for design firms laying out blower rooms. The article comments on these elements in a blower room; general arrangement, heat dissipation, foundation and cranes, noise abatement, piping, and electrical systems. We agree with his conclusion, “The layout of the blower room and ancillary equipment is just as critical to project success as the blowers themselves.”

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

**RODERICK M. SMITH**

Editor

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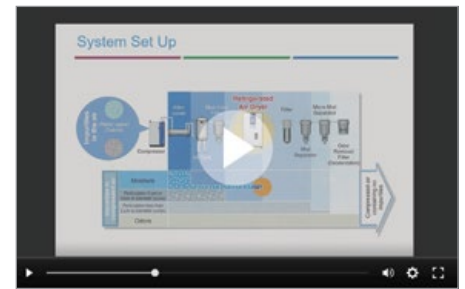
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- **June 8, 2023:** Vacuum Pump Maintenance – *Presenter Tie Duan, Solutions Engineer, E.W. Klein & Co.*  
 Sponsored by Kaishan
- **July 23, 2023:** Engineering Rooms for Aeration Blowers – *Presenter Tom Jenkins, P.E., President, JenTech Inc.*  
 Sponsored by APG-Neuros



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## 2023 MEDIA PARTNERS



# Blower & Vacuum Industry News

## Busch Awarded Family Entrepreneurs of the Year

A company founded in an equal partnership, a cross-generational team at the top, and cultural and professional backgrounds complement each other: The Busch family demonstrated diversity when the concept was just a buzzword. For 25 years, Ayhan, Dr. Karl, Ayla, Sami, and Kaya Busch have jointly managed Busch Vacuum Solutions and collaborated on important decisions. For this corporate culture, the Busch family has been awarded “Family Entrepreneurs of the Year” by the INTES Academy for Family Business. This award began in 2004 and is the most prestigious family business award in Germany.

“With its lived diversity between generations, genders and cultures, the Busch family stands for a form of forward-looking, economically very successful entrepreneurship that exceptionally implements the long-term securing of the company in the hands of the family,” said jury member and INTES\* Managing Director Catharina Prym from the jury’s statement.

The family-owned company with worldwide annual global turnover of around one billion Euro is managed by the founding couple Ayhan and Dr. Karl Busch and their children Ayla, Sami and Kaya Busch. Decisions are made jointly by the Busch family. With this attitude, they cultivate a culture of discussion which requires a great deal of discipline and strength, but at the same time ensures the best results.

“We are all Co-CEOs,” said Kaya Busch, and Ayla Busch said, “Everyone has



Ayla, Dr. Karl, Sami, Ayhan and Kaya Busch (left to right).

a different view, criticism takes us further.” A constructive critical view, diverse perspectives and open words are also expected from the 3,800 employees worldwide who work at six production sites and subsidiaries in 45 countries.

This discussion-oriented corporate culture and cooperation can be traced back to the married couple Ayhan and Dr. Karl Busch. In 1963, the engineer Karl Busch invented the first vacuum pump for packaging foodstuffs, the HUCKEPACK, in the basement of his home. From this innovation, the family company developed leading vacuum and overpressure technology. However, the ingenious invention would never have become so successful without Ayhan Busch. She expanded the organization and ensured the appropriate marketing of the product. From the very beginning, the founding couple pursued an equal partnership in which engineering spirit and entrepreneurship complement each other. The three children were “born into the startup,” as Sami Busch puts it. From an early

age, they had the opportunity to accompany their parents on business trips and share their opinions on the company.

The company has remained loyal to its headquarters in Maulburg for decades, as local anchoring and regional commitment are important to the family. Busch Vacuum Solutions has already received awards for its social and cultural commitment. The family company is not worried about its long-term existence: Six grandchildren are already in the starting blocks to follow their parents and grandparents. “They all want to work for Busch once,” said Dr Karl 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,*

## Blower & Vacuum Industry News

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).

### Edwards Opens Two New Manufacturing Facilities

Edwards, the leading supplier of vacuum and abatement services and solutions to the global semiconductor industry, is opening its new state-of-the-art manufacturing facilities in Chandler, Arizona and Haverhill, Massachusetts, to support the fast-growing North American semiconductor market with services and solutions for the efficient and environmentally sustainable production of chips. The new facilities, which begin operations this quarter, will add valuable manufacturing and service capability to support the rapidly growing US semiconductor industry.

The company's new 200,000-square-foot facility in Chandler began operations in November to provide remanufacturing and assembly of vacuum pumps and other equipment essential to meet the demand for new semiconductor fab requirements. The facility uses advanced automation and data solutions to disassemble, clean, inspect, repair, replace and reassemble pumps.



Edwards' New facility for cryopump manufacturing in Haverhill, Massachusetts.

The Chandler investment will create approximately 200 new jobs in the local area, with scope to grow along with the market.

Meanwhile, Edwards' new facility for cryopump manufacturing and R&D located in Haverhill, 36 miles north of Boston, Massachusetts, will begin operations in mid-December. The 136,000-square-foot building will accommodate all new cryopump product design and manufacturing activities currently performed in the Edwards facility in Chelmsford, Massachusetts.

Edwards will transfer around 280 roles from Chelmsford to Massachusetts and expects to create an additional 60 roles covering skilled manufacturing, engineering and technology.

Environmental sustainability has been a key consideration in the construction of both facilities. Chandler is certified to the Green

Globes science-based building rating system, and features water recycling, electric vehicle charging and solar panels to contribute to more sustainable manufacturing operations. Haverhill incorporates a high-efficiency HVAC system, solar panels and two underground water retention units to collect water to feed surrounding trees and landscaping.

"We are increasing our presence in the US to be close to our customers, who are committing large investments in US semiconductor manufacturing," said Geert Follens, Business Area President Vacuum Technique. "Agile operations, increased capacity and local-for-local supply are essential to supporting our customers, and our Chandler and Haverhill investments will play a key role in the continued growth of safe, productive and environmentally sustainable chip manufacturing in North America."



In addition to the new facilities in Chandler and Haverhill, Edwards recently announced an investment in a new dry pump manufacturing facility in Genesee County, New York, expected to generate around 600 jobs.

#### 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).*

#### Aerzen USA Acquires Aquarius Technologies, LLC

Aerzen USA acquired Aquarius Technologies, LLC, a recognized and innovative municipal and industrial wastewater treatment solutions provider in Saukville, WI. Established in 2006, Aquarius engineers and manufactures diffused aeration products and systems. The

company is globally recognized for its aeration system design, automated aeration system manufacturing, patented Nebula® MultiStage Biofilm technology, and their Quantaer® Diffused Aeration Systems.

“The acquisition of Aquarius Technologies supports Aerzen’s global strategy to expand and enhance the company’s wastewater treatment capabilities and offerings. More importantly, Aquarius sources exclusively from US-based suppliers, presenting a highly desirable solution for contractors and municipalities focused on meeting “Buy American” requirements here in the United

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## Blower & Vacuum Industry News

States,” said Tony Morris, President of Aerzen USA. “Aquarius is poised for growth, and we are excited to have the opportunity to support them with their future growth plans.”

Ann Warnimont, President of Aquarius, said, “The strategic fit between Aerzen and Aquarius offers tremendous opportunities for growth in the markets each company serves. Becoming part of the Aerzen group will enable us to serve our customers while strengthening our overall position more effectively. This acquisition is a significant step forward in offering more complete solutions to the market.”

### About Aerzen USA

*Aerzen USA was founded in 1983 and is a wholly owned subsidiary of Aerzener Maschinenfabrik GmbH, a recognized world leader in the production of rotary positive displacement machines since 1868. Aerzen USA is headquartered in Coatesville, PA, with multiple offices and service centers throughout the United States. Aerzen USA designs and manufactures positive displacement blowers, hybrid blowers, screw compressors, and high-speed turbo blowers with installations around the world. The company specializes in wastewater treatment aeration, pneumatic conveying of bulk materials, and process gas conveying with high-efficiency equipment and world-class product service and support. For more information, visit [www.aerzen.com](http://www.aerzen.com).*

### Ingersoll Rand to Acquire Everest Group and Airmax Groupe

Ingersoll Rand Inc., a global provider of mission-critical flow creation and industrial solutions, has entered into agreements to acquire Everest Blowers Private Limited and Everest Blower Systems Private Limited (collectively, “Everest Group”) and Airmax Groupe (“Airmax”) for a combined all-cash upfront purchase price of approximately \$86 million with additional potential consideration based on achievement of Everest financial targets.

Everest Group expands Ingersoll Rand’s presence in India with complementary products



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under a leading brand. Everest Group is the Indian market leader for customized blower and vacuum pump solutions with a significant focus on innovation and exposure to high-growth, sustainable end markets including water treatment, pharma and food and beverage. Everest Group operates through two manufacturing locations near Delhi, India and has approximately 420 employees.

Airmax is a French compressed air specialist with strong end-user relationships and a technician network focused on aftermarket service. Airmax has approximately 100 employees and nine locations across France.

“Everest Group is the leading domestic manufacturer of blowers and vacuum systems in India and significantly expands our presence in this key growth market. Additionally, it expands our vacuum product line with opportunities to grow both domestically and globally,” said Enrique Minarro Viseras, senior vice president and general manager of the ITS EMEIA business. “Airmax is our largest channel partner in France and we have worked with them for multiple decades. The team has deep local market knowledge, a commitment to customer service and energy optimization expertise and I am thrilled they are joining the Ingersoll Rand family.”

Everest Group and Airmax have combined external revenue of approximately \$35 million and are accretive to segment adjusted EBITDA margins. Both acquisitions are expected to close in the fourth quarter of 2022 and will join the

Industrial Technologies and Services (ITS) segment of Ingersoll Rand.

#### **About Ingersoll Rand Inc.**

*Ingersoll Rand Inc., driven by an entrepreneurial spirit and ownership mindset, is dedicated to helping make life better for our employees, customers and communities. Customers lean on us for our technology-driven excellence in mission-critical flow creation and industrial solutions across 40+ respected brands where our products and services excel in the most complex and harsh conditions. Our employees develop customers for life through their daily commitment to expertise, productivity and efficiency. For more information, visit [www.IRCO.com](http://www.IRCO.com).*

#### **Pfeiffer Vacuum Welcomes this Year's Röntgen Prize Winner**

This year, the prestigious Röntgen Prize was awarded by the Justus Liebig University Giessen (JLU) to the astrophysicist and science advocate for her groundbreaking research in X-ray astronomy. In the JLU's academic ceremony, the prize, which is worth €15,000, was awarded to the Junior Research Group Leader of the Eberhard Karls University in Tübingen and Science Advocate of the ESA. The prize money is donated by Pfeiffer Vacuum and the Ludwig Schunk Foundation. The JLU has been awarding this prize since 1960, in memory of Nobel Prize winner Wilhelm Conrad Röntgen, who was a professor in Giessen from 1879 to 1888.



# Eurus Blower

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## Blower & Vacuum Industry News

JLU's assessment panel dubbed Dr. Victoria Grinberg "an outstanding junior researcher in the field of X-ray astronomy, who has enormous development potential". Prof. Dr. Markus Thoma of the I. Institute of Experimental Physics at JLU said, on behalf of the panel, "She has already forged an internationally recognized leadership role for herself in the field of stellar winds of massive stars."

Dr. Victoria Grinberg studied physics at the Ludwig Maximilians University in Munich and received a PhD in 2013 from the Dr. Karl Remeis-Observatory of the Erlangen-Nuremberg University. Her dissertation was concerned with black holes and, since then, she has focused on the investigation of stellar winds. So-called X-ray binaries play a large role here: Matter from a massive star is transferred via stellar winds to a compact star, such as a black hole, in whose accretion disk (a rotating disk that transports matter toward the center) the X-rays develop.

Dr. Victoria Grinberg investigated the variability of these X-ray sources based on observational data from X-ray satellites and obtained some interesting results concerning stellar winds, which are extremely important for the development of massive stars and X-ray binaries. Using numerical models, she demonstrated that the variability properties provide an insight into the structure of the winds. Dr. Victoria Grinberg was also able to investigate the ionization structure of the winds using X-ray spectroscopy.

This groundbreaking research in X-ray astronomy was carried out by Dr. Victoria Grinberg herself, or by her research group under her leadership, and has already been published in 63 peer-reviewed papers. She was awarded a Margarete von Wrangell Habilitation Grant for Women for her research. In addition to her excellent scientific achievements, she has also excelled in the fields of teaching and science advocacy. She has also given numerous

public presentations and improved the visibility of female scientists in the field of astronomy and astrophysics in German-speaking countries via Twitter, under the hashtag #Astrophysikerinnen.

"The support of young scientists in cutting-edge research is of great importance to Pfeiffer Vacuum. X-ray satellites are developed and tested in space simulation chambers. This happens in large vacuum recipients in which space conditions are simulated. We congratulate Dr. Victoria Grinberg and are pleased that vacuum technology continues to contribute to research," said Daniel Sälzer, Managing Director of Pfeiffer Vacuum, at the award ceremony.

### 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).*



Pfeiffer Vacuum receives this year's Röntgen Prize winner Dr. Victoria Grinberg.

## Brown and Caldwell Recognized by WEF

The Water Environment Federation (WEF) has announced the winners of its annual Operational and Design Excellence Awards competition. The coveted awards honor examples of top-of-industry excellence in operations and design, which contribute to the advancement of the water environment industry. The 2022 installment of the awards features several individuals, technologies, and projects encompassing water reuse, community engagement, nutrient removal, utility optimization, and more.

Highlights include:

- Industrial Water Quality Achievement Award – Bush Beans Process Water Reclamation Facility – (Bush Brothers & Company, Brown and Caldwell/Haskell Company joint venture)
- Project Excellence Award – Water Renewal Utility Plan – (City of Boise, Brown and Caldwell)
- Project Excellence Award – Seneca Water Resource Recovery Facility – (WSSC Water, Brown and Caldwell)

The Industrial Water Quality Achievement Award is presented to a corporation and, if applicable, to its engineering firm that best demonstrates significant, lasting, and measurable excellence in water quality



*The Industrial Water Quality Achievement Award is presented to a corporation and, if applicable, to its engineering firm.*

improvement or in the prevention of water quality degradation as demonstrated by innovative design and operation of an industrial wastewater, pretreatment or source prevention program.

Awarded in this category is Bush Brothers & Company's (Bush's® Best Baked Beans) new Process Water Reclamation Facility (PWRF) located in the Great Smoky Mountains, approximately 40 miles from Knoxville, Tennessee. Designed and built by a joint venture of Brown and Caldwell and Haskell Company, the 2.1 million gallons per day (mgd) facility treats production process water to a high effluent quality to irrigate more than 900 acres of Bush Brothers & Company-owned agriculture. Additionally, some of the treated water is reused in non-food-contact applications to reduce the demand for source water.

The innovative PWRF was heralded for its water recycling capabilities and cost-effective, aesthetically pleasing solution to complement the surrounding landscape. The socially responsible project was delivered significantly under budget.

WEF's Project Excellence Award pays tribute to excellence and innovation in the execution of projects and programs in the water sector.

The City of Boise's Water Renewal Utility Plan (Utility Plan) was recognized for its community-centric approach. The Utility Plan is the culmination of integrating thousands of pieces of public input, technical evaluations, and comprehensive analyses of the regulatory, affordability, and environmental implications for the future of how Boise collects, cleans, and beneficially reuses over 10 billion gallons of water every year.



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## Blower & Vacuum Industry News

Led by Boise's Water Renewal Services and Brown and Caldwell, the Utility Plan includes strategies to address climate change concerns and regulatory requirements while meeting the water renewal demands of a community expected to grow by 20 percent over the next 20 years.

Furthermore, the plan prioritizes capital investment strategies for replacing Boise's aging water renewal infrastructure and mechanisms to address future capacity needs with community affordability in mind.

Nutrient removal optimizations at the Seneca Water Resource Recovery Facility (WRRF) in Maryland were recognized by WEF for demonstrating energy and chemical cost savings projected to be \$575,000/year, resulting in decreased carbon footprint and reduced financial burden to customers.

The demonstration project, spearheaded by WSSC Water and Brown and Caldwell, relied on advanced aeration control and other operational changes to use the inherent carbon in the influent wastewater more efficiently to continue to meet stringent nutrient limits and help protect the Chesapeake Bay.

The successful demonstration of the new optimization strategies has led to plans to expand these cost-saving strategies at the six WRRFs owned by WSSC Water, which can be instrumental in maintaining affordable and sustainable service.

"Our warmest congratulations go to Bush Brothers & Company, the City of Boise, and WSSC Water for recognition and celebration

of their visionary leadership, innovation, and environmental stewardship," said Brown and Caldwell Chief Technical Officer Wendy Broley. "We appreciate the partnership and collaboration in advancing leading-edge projects that make a difference within the industry and for the communities they serve."

### About Brown and Caldwell

Headquartered in Walnut Creek, California, Brown and Caldwell is a full-service environmental engineering and construction services firm with 52 offices and 1,800 professionals across North America and the Pacific. For 75 years, our creative solutions have helped municipalities, private industry, and government agencies successfully overcome their most challenging water and environmental obstacles. As an employee-owned company, Brown and Caldwell is passionate about exceeding our clients' expectations and making a difference for our employees, our communities, and our environment. For more information, visit [www.browncaldwell.com](http://www.browncaldwell.com).

### Eastern Controls Brings Expertise to New Northeast Markets

Endress+Hauser announced its representative partner of seven years, Eastern Controls, is the new, exclusive authorized sales and service provider for the municipal markets in east Pennsylvania, New Jersey and Delaware, effective Dec. 1, 2022.

"We are pleased to announce Eastern Controls is now our municipal representative for our east Pennsylvania, New Jersey and Delaware markets," said Shaun Beauchesne, Area Vice President (East Central Area) at Endress+Hauser. "Eastern Controls is no stranger to this market. They have a team



Long-time Endress+Hauser representative partner is now the exclusive authorized sales and service provider for municipalities for the east Pennsylvania, New Jersey and Delaware markets.

of sales and service professionals who have been working in this market for decades. They understand this market and have a great team to support our existing and future customers.”

With years of experience and vast industry knowledge, Eastern Controls aims to continue solving customers’ challenges and meeting their instrumentation, valves, heat trace and gas detection needs to optimize processes in the water and wastewater industry and other process industries. Eastern Controls specializes in calibration and maintaining high-quality service capabilities.

“For more than 40 years, Eastern Controls has supported the Mid-Atlantic’s water and wastewater industry with world-class services, instruments, gas detection, valves and actuators,” said Cliff McLaughlin, President of Eastern Controls. “Our comprehensive solutions are growing further with the expansion of our Endress+Hauser water and

wastewater territory. We are extremely pleased to include Endress+Hauser’s water/wastewater instrumentation and analysis portfolio with Eastern Controls’ gas detection, valves, actuators, and services to provide the highest level of solutions and support.”

#### **About Endress+Hauser**

*Endress+Hauser is a global leader in measurement and automation technology for process and laboratory applications. The family company, headquartered in Reinach, Switzerland, achieved net sales of approximately 2.9 billion euros (3.3 billion U.S. dollars) in 2021 with a total workforce of more than 15,000 worldwide. Endress+Hauser devices, solutions and services are at home in many industries. Customers thus use them to gain valuable knowledge from their applications. This enables them to improve their products, work economically and at the same time protect people and the environment. For further information, please visit [www.us.endress.com](http://www.us.endress.com).*

## **ProVac Reaches 25-Years in the Irish Vacuum Equipment Market**

A leader in vacuum solutions, throughout the 32 counties of Ireland, reaches a quarter of a century in business and celebrates a prosperous future. Founded in 1997, the Wexford based company, ProVac Ltd, provide a level of support for customers vacuum pumps and systems that was previously unavailable in the region.

The ProVac name is synonymous with vacuum expertise, exceptional customer service and trusted vacuum solutions. While the core business involves the sales and service of vacuum pumps and related equipment, the company is differentiated in the market by its capability to design and specify customized solutions for customers in performance critical process industries, including pharmaceutical, medical devices, and semiconductor.

Ian Dorman, General Manager, sees the company on a very good path. "Since the acquisition by Atlas Copco, ProVac is able to serve its customers even better, and further strengthen the market presence of the Leybold brand across Ireland. Being part of the Leybold EMEA North Customer Centre, allows the regional ProVac team to deliver local support, backed by Leybold’s global product and application network when needed. We are committed to selling and servicing Leybold products in the Irish market and see great potential for the future.”

Quality and customer proximity have always been a tradition at ProVac. Each factory trained service engineer is qualified to handle the maintenance and repair of virtually



## Blower & Vacuum Industry News

any brand and model of vacuum pump.

“We have service options available for all customers’ challenges and budgets,” said John Whelan, Service Manager. “Whether annual preventative maintenance contracts, or rapid response support, our skilled service team is on hand to keep customers up and running, and downtime to a minimum.”

As a local employer we want to attract, develop and retain motivated and resourceful people, and encourage diversity in all forms. “Although the ProVac celebrates the 25 year business milestone, we are only beginning our people journey,” said Sarah Cogswell, HR Manager. “Our mission is to promote a culture of lifelong learning, continuous feedback and self-development to enable people’s full potential. All employees have a ‘mission’, which includes performance and development goals, and take part in our Performance Enablement cycle. We’re also passionate about encouraging diversity at every level of the business, and nurture an inclusive environment, where everyone has a sense of belonging.”

James Delaney, who founded the company in 1997, along with Helen Delany who has since

retired, sees exciting times ahead and great opportunities for both customers and employees. “ProVac has always felt like a family business, with a strong culture of innovation in vacuum and commitment to our customers,” said James. “Since joining Leybold in December we have been able to further build on our in-house technical expertise by expanding our team, and we’re now introducing common processes, services and tools which make us more efficient and effective. 25 years is a huge milestone which I’m look forward to celebrating over the coming months, with both the team and customers, as we begin the next chapter of the ProVac story.”

### **About ProVac**

*ProVac Ltd specializes in the design, manufacture and installation, of complete vacuum solutions, incorporating vacuum chambers, pumps, gauges, valves and control systems. We serve customers across industries such as pharmaceutical, medical device and semiconductor, traditional industries like food & packaging, engineering and energy, as well as third level research institutes, universities and R&D center. The ProVac name is synonymous with vacuum expertise, exceptional customer service and trusted vacuum solutions. Based in Wexford, Ireland, ProVac Ltd was established in 1997 and in 2021*

*joined Leybold, a member of the Atlas Copco Group. Currently with 11 employees serving customers throughout the 32 counties of Ireland. For more information, visit [www.provac.ie](http://www.provac.ie).*

### **Atlas Copco Acquires German Vacuum and Blower Manufacturer**

Atlas Copco has agreed to acquire CVS Engineering GmbH, a German manufacturer of industrial vacuum pumps and blowers for mobile use on tanker trucks and other types of transport. CVS Engineering GmbH (CVS Engineering) is headquartered in Rheinfelden, Germany, and has 76 employees. In 2021, the company had an annual revenue of approx. MEUR 20 (approx. MSEK 200\*).

“The acquisition will add to our mobile vacuum solutions portfolio, allowing us to expand further in this market,” said Geert Follens, Business Area President Vacuum Technique.

“The acquisition of CVS Engineering will allow us to increase our footprint in Europe.”

The purchase price is not disclosed. CVS Engineering GmbH will become part of the Industrial Vacuum Division within the Vacuum Technique business area. The acquisition is expected to close during Q1 2023.

### **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 2021, Atlas Copco had revenues of BSEK111 and at year end about 43,000 employees. For more information, visit [www.atlascopco.com](http://www.atlascopco.com).*



*A leader in vacuum solutions, throughout the 32 counties of Ireland, reaches a quarter of a century in business and celebrates a prosperous future.*



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**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

**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



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 Senior Consultant,  
 Circle Training  
 & Consulting



**Frank Melch**  
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# Hygienic Vacuum Packaging for Cheese

By Allen Fletcher, Busch Vacuum Solutions



*Vacuum packaging cheese increases the shelf life without forfeiting taste, appearance or quality.*

► Using vacuum or a protective gas during the packaging process is one of today's most common methods for hygienically packaging foodstuffs in portioned packaging that is attractive to consumers. Vacuum and protective gas both reduce the activity of oxygen-dependent microorganisms inside the packaging. This way, vacuum-packaged foodstuffs have a longer shelf life, even without preservatives. There are different types of vacuum packaging. When it comes to cheese, the type of vacuum packaging depends heavily on the specific type of cheese.

Microorganisms generally play a key role during cheese production. But with

packaged cheese, the aim is to avoid these microbes altogether, as they can spoil the cheese. Hard cheeses with low water (below 56 percent) tend to experience mold, while soft cheeses are more likely to be affected by bacteria. Some cheese varieties turn rancid from oxidation

when the fats in the cheese come into contact with oxygen. So there is good evidence that using packaging to protect cheese from microorganisms is beneficial to achieve the longest possible shelf life without forfeiting taste, appearance or quality. This means that it is important to ensure that cheese is not exposed to normal ambient air in the packaging.



*The R5 rotary vane vacuum pump from Busch is perfectly suited for use in vacuum packaging.*

## Extending Shelf Life with Vacuum Packaging

The ambient air and thus most of the oxygen is evacuated from the packaging itself in all types of vacuum packaging. This minimizes the activity of aerobic microbes in cheese and significantly extends the shelf life



of packaged cheese. But there are other factors that also play a key role in how long the shelf life will be. In particular, the ingredients in the cheese and the storage temperature influence the shelf life. For a hard cheese that contains little moisture, the shelf life can be extended from two to as much as ten weeks using vacuum packaging. A soft cheese has a normal shelf life of eight days in ambient air. Packaging under vacuum or with a protective gas can extend this period up to three weeks without impacting the quality.

Along with the extended shelf life, vacuum packaging enjoys other advantages:

- Foodstuffs do not suffer from changes in taste, smell, or look.
- Protection from contact and contamination
- Prevention of drying out
- Excellent storage and presentation options

There are various types of packaging that can be used for cheese. Depending on the type of packaging, the cheese is either vacuum-packaged or the air-free packaging is flooded

with a protective gas. This process replaces the atmosphere in the packaging with a gas or a gas mixture. The most common examples of this packaging process involve the use of plastic bags, prefabricated trays, or heat-sealed plastic foil.

Next to choosing the most suitable type of packaging, the type of vacuum pump used is decisive for the quality of the packaging and thereby the shelf life of the cheese and the preservation of its quality. Each cheese and type of packaging requires an optimally adjusted vacuum level during the packaging process. The lower the ultimate pressure of a vacuum pump is, the more reliably the desired vacuum

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## Hygienic Vacuum Packaging for Cheese

inside the packaging can be precisely set. Modern rotary vane vacuum pumps achieve an ultimate pressure of 0.1 millibar, for example. This corresponds to one ten thousandth of the atmospheric air pressure at sea level.

### Air-Tight Seal for Cheese

Vacuum pumps evacuate the packaging chamber to the desired vacuum level. For cheese, this is usually 100 to 300 millibar. Newly developed technologies make it possible to use vacuum to package cheese with enclosed air without deforming the cheese. The actual evacuation process – meaning the suctioning out of air from a packaging chamber with subsequent aeration and sealing – is essentially similar for all packaging types. The foodstuff goes into the packaging chamber in a bag or a prefabricated tray with a foil covering. The air is then suctioned out by a vacuum pump. This means that the oxygen in the air is also extracted from the packaging chamber and the packaging itself.

When the desired vacuum has been achieved, the packaging parts are sealed together.

The packaging chamber is now aerated to atmospheric pressure, thus pressing the packaging foil tightly against the packaged foodstuff. When using a protective gas, the packaging chamber is filled with a protective gas after the ambient air is evacuated. Instead of using air, the packaging chamber is aerated to atmospheric pressure with a protective gas, followed by sealing.

### Protective Gas Allows Cheese to Continue Maturing in the Packaging

Carbon dioxide (CO<sub>2</sub>) and nitrogen (N<sub>2</sub>) are often used as a protective gas in cheese packaging. For hard cheese, only carbon dioxide is used to ensure the longest possible shelf life. For other types of cheese, the carbon dioxide amount goes down to between 20 and 40 percent. The rest of the gas mixture usually consists of nitrogen.

Using a protective gas for packaging provides the benefit of giving the cheese more space within the packaging chamber, allowing it to breathe and thus further mature, developing more taste. Individual cheese slices can also

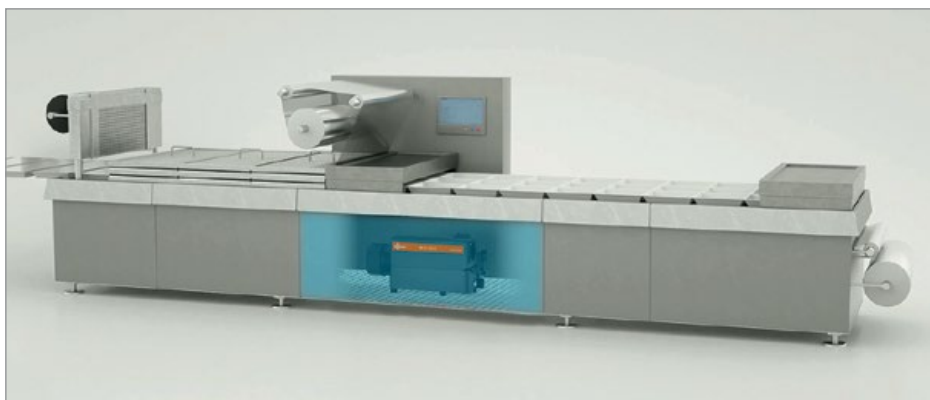
be removed more easily because they are not pressed together by the foil as they are when using pure vacuum packaging.

### The Role of the Vacuum Pump in Packaging

Regardless of the type of packaging and the foodstuffs packaged, the vacuum pump always performs the same function: to extract the air from the packaging chamber. Since the beginning of vacuum packaging, this has been achieved using oil-lubricated rotary vane vacuum pumps. In 1963, Busch Vacuum Solutions introduced the first rotary vane vacuum pump to the market, developed especially for this application. This vacuum technology has been continuously developed over the years, such that R5 rotary vane vacuum pumps from Busch continue to offer state-of-the-art technology for vacuum packaging today.

Beside their reliability and longevity, they are also characterized by a high-water vapor tolerance. The water vapor tolerance of a vacuum pump has a direct influence on the quality of the packaged product. It indicates how much water vapor can be suctioned out of the packaging chamber along with the air to be extracted, without it condensing in the vacuum pump or having a negative effect on the pump-down time.

All types of cheese have fairly high-water content between 56 percent for hard cheeses and up to 80 percent in cream cheese. If a particular vacuum level is achieved



*Thermofforming packaging machine with an integrated R5 rotary vane vacuum pump from Busch.*

during the evacuation process, the water on or in the cheese begins to evaporate and must additionally be suctioned out by the vacuum pump in the form of vapor. If a low-performance vacuum pump is used, it is unable to deal with this situation, and the pump-down time could become significantly longer. In turn, the longer pump-down time can have a negative effect on product quality because moisture is extracted from the cheese.

For this reason, it is essential to use a vacuum pump with a sufficiently high pumping speed at low pressures to achieve the desired vacuum level before water evaporates or gases begin to escape from the cheese. Furthermore, a

vacuum pump has to be designed in a way that, even when used in cooled spaces, an operating temperature can be reached that prevents water vapor from condensing inside the pump, which could have a negative effect on the performance and service life of the vacuum pump. The proper dimensioning of the vacuum pump and its integration into the control system requires a precise analysis of the packaging process. **BP**

**About the Author and Busch Vacuum Pumps and Systems**

*Allen Fletcher is the Business Development Manager-Food Market for Busch Vacuum 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 email [Allen.fletcher@buschusa.com](mailto:Allen.fletcher@buschusa.com) or visit [www.buschvacuum.com](http://www.buschvacuum.com).*

All images courtesy of Busch Vacuum Pumps and Systems.

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# Design Tips for Aeration Blower Rooms

By Tom Jenkins, JenTech Inc.



► Discussions of aeration blowers tend to be dominated by energy considerations and innovative technology. A stable and normally risk-averse industry has recently begun adopting innovative designs rapidly, largely driven by the growing emphasis on energy and sustainability.

The concerns for innovative technology and reduced energy are well placed. However, the design process isn't complete when the evaluation has resulted in a blower selection. Most often the blowers are installed in a blower room or blower building. The benefits of optimized blower selection are lost if the installation design isn't satisfactory. The physical constraints on the installation are largely the same regardless of blower type.

## General Arrangement

Many blower projects involve retrofitting new blowers to an existing plant. This can present challenges that don't exist in greenfield

construction. Design compromises may be needed in retrofit projects, but the compromises should not be made at the expense of operator safety or blower functionality.

Footprint – the length and width of each blower skid or package – determines the necessary floor space. In most cases the contractor will make the final equipment selection based on competitive bidding. That requires the designer's laying out the blower room based on information obtained from several potential suppliers and using the worst-case dimensions.

The most common arrangement is a single row of blowers parallel to each other. This creates a blower room that is longer than it is wide. The inlet and discharge connections are placed closest to the wall and the motors are adjacent to the aisle. This minimizes pipe length.





Figure 1: Example Blower Room Layout with Housekeeping Slabs and Generous Spacing for Service Access

Occasionally it is advantageous to install the blowers at an angle to the building wall to increase the width of the aisle. Another common arrangement is two rows of blowers with a central aisle between them. [See Figure 1]

Regardless of arrangement adequate space must be allowed between each blower for easy access for maintenance and repair. This is typically 36" minimum, but more space may be required for large blowers or some packages.

**Heat Dissipation**

There are multiple sources of heat in any blower system. The most obvious is the heat of compression – the temperature increase that occurs as the air volume is reduced. The temperature increase is a function of the pressure ratio and blower efficiency:

$$\Delta T = \frac{\left[ \left( \frac{p_d}{p_i} \right)^{0.283} - 1 \right] \cdot T_{in}}{\eta_b}$$

Where:

- $\Delta T$  = temperature increase, °R or °F
- $p_{d,i}$  = discharge and inlet pressure, psia
- $T_{in}$  = inlet temperature, °R = °F+460
- $\eta_b$  = blower efficiency, decimal

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## Design Tips for Aeration Blower Rooms

Most of the heat of compression is carried away by the discharge air stream. Some heat is transferred from the blower case and piping to the blower room. Piping is often insulated for personnel protection and noise mitigation, making the heat transfer negligible. The blower case may also be insulated or inside a sound enclosure, minimizing room heating.

The rate of heat transfer from bare piping or a bare blower case is a complex phenomenon, involving conduction, convection, and radiation. It is proportional to the area of the warm body and the temperature difference between it and ambient air. The surface of the blower case is usually ribbed or convoluted.

For most purposes an estimate of the heat rejected is sufficient:

$$H_{b,p} = 2.4 \cdot F \cdot A \cdot (T_d - T_a)$$

Where:

$H_{b,p}$  = Heat rejected to room from blower or piping, BTU/hr

$F$  = Factor for surface area,  $F = 1.0$  for pipes,  $F \approx 1.25$  for a ribbed blower case

$T_{d,a}$  = Temperature of discharge air or ambient air, °F

The other major source for heat rejected by the blower system is inefficiency in the electrical components such as motors and variable

frequency drives (VFDs). This can be quite substantial:

$$H_e = 2544 \cdot P_m \cdot (1 - \eta_m \cdot \eta_{vfd})$$

Where:

$H_e$  = Heat rejected to room from electrical components, BTU/hr

$P_m$  = Motor power draw, hp

$\eta_{m,vfd}$  = Efficiency of motor and VFD, decimal ( $\eta_{vfd} = 1.0$  if constant speed)

Note: 1 hp = 2,544 BTU/hr.

The calculated heat rejected by VFDs is used to size cooling equipment for electrical rooms. If the VFD is in the blower room the large

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room volume and high rate of heat generation usually makes room air conditioning impractical. It is generally feasible to use forced ventilation with outside air to reduce the blower room temperature to acceptable levels. If the outside air extreme temperature is unacceptably high it may be necessary to provide electrical equipment with enclosures and air conditioning or heat exchange systems to maintain acceptable temperatures.

The ventilation air required to reduce blower room temperature can be estimated:

$$Q_{fan} = \frac{H_b + H_p + H_e}{1.08 \cdot (T_r - T_o)}$$

Where:

- $Q_{fan}$  = Required ventilating air flowrate, cfm
- $H_{b,p,e}$  = Heat rejected by blower, piping, and electrical equipment, BTU/hr
- $T_r, T_o$  = Room and outside air temperature, °F

It is necessary to track where the rejected heat goes. Some package designs keep the heat within the blower enclosure or exhaust it into the blower room. Using heated air for the blower inlet affects performance. Other packages exhaust cooling air and heat outside the blower room, which requires fans and ducting. If water is used in a heat exchanger and is sent to a drain the heat won't affect blower operation but there will be added costs

associated with supplying the water and equipment.

Elevation effects temperature ratings because the reduction in air density reduces its cooling capacity. Most electrical equipment and motors are rated for 3,000 ft above sea level (FASL) or less. Higher elevations may require derating or additional cooling.

**Foundations and Cranes**

Blowers can represent a significant structural load. Adequate strength is obviously a consideration, but just as important is providing sufficient stiffness to prevent vibration transmission.



## Design Tips for Aeration Blower Rooms

Anchor bolts are used for positive displacement, geared single stage, and multistage blowers, but some manufacturers recommend omitting or not tightening the nuts to prevent warping the blower skid. These blowers generally include vibration dampening pads at each anchor point between the skid and the slab.

Packaged blowers generally do not need anchors. They are provided with adjustable levelling feet and are merely set onto the floor slab.

Structural considerations may be particularly vexing in retrofit applications. It is not uncommon to have a basement below the

blower room floor to accommodate inlet and discharge piping. This construction was particularly common for large blowers. It is necessary to verify that the slabs and columns are structurally adequate for the replacement blower loads. If the blower room floor is at grade level without a basement the structural considerations are simplified, but adequacy should not be taken for granted.

Housekeeping slabs are commonly used to elevate blower skids above the main floor slab. This simplifies washdown. Reuse of existing housekeeping slabs may dictate equipment layouts in upgrades.

The blower room should have aisles and overhead doors large enough to permit access by fork trucks, flatbed trucks, and lifting equipment. Large facilities and older plants often have overhead cranes installed in the blower room for use in servicing. In new construction it may be more economical to omit the overhead crane and instead make accommodations for portable gantries, mobile cranes, or other temporary lifting devices.

### Noise Abatement

All blowers generate noise. The degree to which that creates a problem is a function of several factors:



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- Noise level produced – dB(A), a logarithmic scale for representing the noise energy
- Distance – noise energy dissipates inversely with the square of the distance from the source
- Frequency – high frequency noise may be more irritating but is easier to attenuate
- Time of exposure – as exposure time extends the potential for harm to personnel increases
- Room geometry and wall treatment – rooms with reflective walls will be louder

The National Institute for Occupational Safety and Health (NIOSH) has created recommendations for maximum safe exposure time relative to noise level:

$$t = \frac{480}{2^{\left(\frac{L-85}{3}\right)}}$$

Where:

t = Recommended maximum exposure time, minutes

L = Noise level, dB(A)

**Recommended Maximum Noise Exposure**

Noise Level, dB(A)	Time
80	25 hours
85	8 hours
90	2.5 hours
95	48 minutes
100	15 minutes



Figure 2: Example Blower Room Layout with 45° Connection to Carbon Steel Discharge Header (Upper Pipe)

If personnel exposure exceeds these limits hearing protection is necessary. Hearing protection earmuffs can reduce noise levels by 20 to 30 dB(A).

Sound attenuating enclosures are standard for packaged blowers and typically reduce noise to 85 dB(A) or less. Custom noise enclosures are available for all types of blowers, although they may not be cost effective. Other noise reduction methods include insulation on piping, acoustic wrapping blowers, and sound deadening panels or blankets on walls.

For many systems silencers in the inlet, discharge, and blow-off valves are used to minimize noise levels. Silencers may be field installed or included with packaged systems. The blower supplier should be consulted for silencer requirements and construction.

**Piping**

Blower room piping should be generously sized to minimize friction losses and noise. This entails keeping air velocities in pipe, fittings, and valves low.

**Typical Distribution Piping Air Velocities**

Nominal Pipe Diameter	Design Velocity, feet per minute
1" to 3"	1,200 to 1,800
4" to 10"	1,800 to 3,000
12" to 24"	2,700 to 4,000
30" to 60"	3,800 to 6,500

Silencers, valves, and fittings in the blower room often create more pressure loss than the longer air distribution piping to tanks. The minimum pressure differential needed for opening the required check valves for each blower may be substantial. The specified blower discharge pressure should include these losses.

## Design Tips for Aeration Blower Rooms

Flow through a tee branch creates a pressure loss equal to 60 diameters of straight pipe. Whenever possible the connection for individual blowers to the main distribution header should be at 45° to the header to reduce losses. [See Figure 2] This can be particularly helpful when bringing additional blowers online against system pressure.

Inlet air is often drawn from inside the blower room. This necessitates adequate screened or louvered wall openings to accommodate maximum air flow into the room. Whether blower inlet filters are external or part of a package, piped inlets should be considered. In cold climates drawing process air from outside into the blower room can create uncomfortably low interior temperatures.

Discharge headers should be above inlet piping to reduce heat gain by the inlet pipe.

Material selection is not usually critical for piping inside blower rooms. Painted Schedule 40 carbon steel is a common choice, but in larger diameters Schedule 5 or 10 may be more economical.

Blower inlet and discharge flanges are not designed to support the weight of external piping. Full support should be provided for piping. A flexible coupling or expansion joint should be installed between the blower and the piping to prevent transferring loads to the blower case and to accommodate thermal growth.

Flow meters are often installed in blower rooms. Accurate measurement requires uniform velocity across the pipe diameter. Because of limited space and the number of valves and fittings achieving this is problematic. The flow meter supplier should be consulted during design to detect installation issues.

### Electrical Systems

Blower building layout should include consideration of electrical power distribution equipment. It is common to provide a separate electrical room for motor control centers (MCCs). This is the typical location for branch circuit protection devices, and motor starters for constant speed applications are usually installed in an MCC. If VFDs are used for control they may be in the MCC or part of package systems. If VFDs are free standing it may be advantageous to install them close to the blower to minimize the length of wiring and decrease the potential for electrical harmonics and bearing fluting from induced shaft currents.

Heat dissipation is especially critical for electrical equipment. Most VFDs are limited to 40°C (104°F) ambient temperature, although units rated at 50°C (122°F) are available. It may be necessary to provide cooling systems for VFD enclosures or the entire electrical room.

Cooling may be by air conditioners or closed loop water-to-air heat exchangers. Large VFDs offer the option of direct water cooling. Closed loop systems with water-to-air heat exchangers for mounting outside the blower room are available.

Access to enclosures for service is as important for electrical systems as it is for the blower itself. The National Electrical Code (NEC) identifies minimum workspace in front of MCCs and enclosures, but some equipment may need more area. Specific requirements should be verified with suppliers.

### Conclusion

Supplying air to process equipment necessitates a system approach. Selecting the blowers is a critical design step, but far from the final one. The layout of the blower room and ancillary equipment is just as critical to project success as the blowers themselves. **BP**

### About the Author

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

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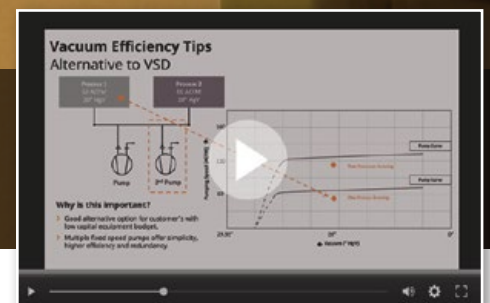


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# Blower & Vacuum Technology News

## Leybold Offers VARODRY VDi System

In industrial vacuum processes, the requirements for smart performance management and energy efficiency are constantly increasing. For more intelligence, variability and efficiency in coating, drying and heat treatment processes, vacuum specialist Leybold has therefore developed the VARODRY VDi vacuum system with integrated VAControl CAB control. The pump systems of the new series consist of the air-cooled, oil-free VARODRY screw pumps, the dry-compressing Roots pumps of the RUVAC series as well as the VAControl CAB control for smart management of all pump processes.

“In concrete terms, users today expect dry, flexible vacuum solutions with a high pumping speed. Therefore, quick and uncomplicated adjustment possibilities of the vacuum performance to the respective process conditions are necessary,” said the responsible Product Manager, Dennis Schröder, outlining



Leybold offers VARODRY VDi system for industrial vacuum processes.

the requirement profile. Schröder said that, especially with rising energy prices, customers do not want to worry about unplanned process and maintenance costs. To meet their profitability and sustainability goals, the energy and resource consumption should therefore be as low as possible and calculable.

To achieve this, the VDi system can be configured by the operator according to the process requirements. This allows users to set their own vacuum capacities as needed to match the pump-down process and the pumping speed. Another advantage is to protect against critical gases and particles. The VARODRY VDi vacuum system can be equipped with gas ballast and purge gas. This increases the service life and system availability. In some application environments where steam or dust is present, additional filter options ensure an uninterrupted vacuum supply. Additional energy savings and even wear are ensured by the Energy Saver Kit.

More intelligence in the applications is provided by the heart of the system – the integrated VAControl CAB control system specially programmed by Leybold. With its smart software functions, the processes can be controlled and optimized in a user-friendly way. Users can choose between local, remote or cloud connectivity. Different authorization levels can be created for the individual user accounts.

During the vacuum processes, all pump data is recorded and stored. The operating logs, which can be viewed at any time, provide maximum transparency for users and ultimately ensure high production and product quality. The

powerful computer generates maintenance and service recommendations depending on use – some of the maintenance, such as changing the belt on the VARODRY, can be carried out by the operator himself. “The software updates are available for download from Leybold. Many additional software options are planned for the future,” said Product Manager Dennis Schröder.

## About Leybold

*Leybold is a part of the Atlas Copco's Vacuum Technique business area and offers a broad range of advanced vacuum solutions for use in manufacturing and analytical processes, as well as for research purposes. The core capabilities center on the development of application- and customer-specific systems for the creation of vacuums and extraction of processing gases. Fields of application are secondary metallurgy, heat treatment, automotive industry, coating technologies, solar and thin films such as displays, research & development, analytical instruments, food & packaging, as well as a multitude of other classic industrial processes. For more information, visit [www.leybold.com](http://www.leybold.com).*

## Eurus Blower Introduces VR Series of Steam Blowers

Eurus Blower, a wholly owned subsidiary of Shandong Zhangqiu Blower Co., Ltd. (SZB) one of the world's largest suppliers of Rotary Lobe Blowers, announces the introduction of the VR Series of steam blowers to the North American market. These blowers are used in thermal separation technology applications (evaporation, distillation, crystallization, concentration, and drying processes) to reduce overall plant energy consumption. Mechanical Vapor Recompression (MVR) applications include dairy, brewing, sugar, saline, pulp,



Eurus Blower introduces the VR Series of steam blowers to the North American market.

chemical, and alcohol industries, among others. MVR is an energy recovery process where energy is added to the steam blower's inlet flow by compressing to a higher pressure, resulting in a smaller volume, higher pressure vapor used to produce useful work.

The VR Series offers evaporation capacities of 66-16,300 lb/hr, with temperature rise of 50-77°F. Materials of construction include CS, SS304, SS316, SS316L, duplex stainless steel, titanium, and special corrosion resistant coatings.

Roger Blanton, General Manager and Marketing Director of Eurus Blower, said, "This exciting VR Series of steam blowers offers customers a greater selection of corrosion resistant choices than other brands. The VR product introduction complements recent success with our multistage centrifugal product. Building on our parent company's high-quality products, Eurus Blower's customer service focus is unmatched in the North American market as we continue meeting needs."

### About Eurus Blower, Inc.

*Shandong Zhangqiu Blower Co., Ltd. (SZB) was founded in 1968. Our manufacturing area is greater than 1,000,000 square feet, and our annual production is more than 13,000 units. Founded on the principles of providing superior product quality, value, and dependability; we hold QMS certifications from ISO9001, ISO14001, and GB/T28001. After 30 years of establishing a solid foundation in China, we began to export our blowers in the late 1990s. The company quickly became known as an industry leader in blower technology across international markets. In 2008, with over 40 years of blower manufacturing experience, Shandong Zhangqiu Blower Co. established Eurus Blower, Inc. in the U.S. with a vision of providing competitively priced, high-quality blowers for new or replacement blower applications to North and South American wastewater treatment and industrial marketplaces. For more information, please visit [www.eurusblower.com](http://www.eurusblower.com)*

### Pfeiffer Vacuum Introduces the SmartVane for Mass Spectrometry

Pfeiffer Vacuum, a leading provider of vacuum technology, introduces the first rotary vane pump for mass spectrometry with a hermetically sealed pump housing. The SmartVane serves as a backing pump for mass spectrometers (ICP-MS, LC/MS), for applications in environmental and food analytics, as well as in pharmaceutical and clinical analytics. This vacuum pump is designed to ensure that no oil leaks occur therefore preventing any contamination. Thanks to the integrated motor, no conventional seal is needed, which means that the SmartVane has longer maintenance intervals.

As Marcel Merkardt, Product Manager at Pfeiffer Vacuum, said, "With SmartVane, oil

leaks in the laboratory are a thing of the past. Here, we combine the advantages of the tried-and-tested rotary vane pump principle with a revolutionary sealed design. In practice, this means that you benefit from the familiar high performance of a rotary vane pump, but without any disadvantageous oil leaks."

The low noise level of the SmartVane ensures ideal conditions in the laboratory. With its typical operating pressure of less than 10 hPA, it is quieter than other pumps used for this type of application. This makes it possible to carry out even challenging tasks in a pleasant working environment. Its compact design makes it easy to incorporate n existing systems. In addition, the pump offers intelligent communication options and can be used as a plug-and-play solution in combination with existing devices.

An additional key benefit is the pump's sustainability. The SmartVane has an integrated energy-efficient IPM motor with a stand-by function. Its low power consumption automatically reduces the operating costs and CO<sub>2</sub> footprint.



The new SmartVane vacuum pump from Pfeiffer Vacuum has a hermetically sealed pump housing for absolute cleanliness.



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## Blower & Vacuum Technology News

### 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)*

### Gamma Vacuum Introduces New Sintered NEG Pump Series

Non-evaporable getter (NEG) pumps have a whole range of functional and ergonomic advantages for applications that require cost-effective and reliable ultra-high vacuum conditions. Unlike most vacuum pumps, NEG pumps are gas-capturing pumps that bind gases by means of sorption. This results in low energy consumption, little noise, and no vibration. NEG pumps have no moving components and are therefore maintenance-free.

With these attributes, they are predestined for a whole range of applications in research, medicine, industry and analytics. In these areas, they reach pressures of less than 1x10<sup>-10</sup> mbar due to their operating principle. A critical requirement in such applications is the absence



Gamma Vacuum Sintered NEG.

of dust particles as those badly influence the performance of the customers' applications. Sintered NEG material is widely believed to strongly reduce emission of such particles into the application. Therefore, Gamma Vacuum developed its new NEG pumps that are based on sintered material. "The increased pumping performance of this NEG series with respect to our conventional NP series (NEG pumps based on pressed material) and their superior hydrogen capacity in comparison to the other NEG pumps available on the market are additional benefits," said Dr. Stefan Lausberg, product manager for Gamma Vacuum.

The NEG series ranges from 50 l/s up to 400 l/s in pumping speed: 50NS, 100NS, 200NS, 300NS, 400NS, 410NS. All pumps are mounted on a DN 40 CF (2.75" CF) flange. The first five pumps have a 3-pin feedthrough which is a common style on the market. In order to fulfill customers' requests, the 410MS is equipped with a special 4-pin feedthrough while it has the same pumping speed as the 400NS.

NEG vacuum pumps can be used in a broad spectrum of scientific and medical applications, like electron microscopes, research and medical accelerators or surface science. Due to their superior hydrogen pumping speed they are especially well-suited in the ultra-high vacuum range where hydrogen is the dominant gas species.

After the NEG pump has been heated up it does not consume any electricity until it is saturated. "This makes it an energy efficient, vibration-free and noiseless pump," said product manager Dr. Stefan Lausberg. Another advantage, a NEG pump can be installed and operated in any orientation, even in confined spaces, and provides a practical way to maintain ultra-high vacuum pressures over a long period of time.

#### About Gamma Vacuum

*Gamma Vacuum specializes in the design, manufacture and distribution of ion and titanium sublimation pumps, serving customers across a diverse range of scientific applications, including R&D and High Energy Physics. Our people are committed to be the foremost source in Ultra High Vacuum knowledge and expertise globally, delivering consistent superior quality, at a low initial and operational cost. Based in Shakopee, Minnesota, USA, Gamma Vacuum was established in 2003, and is an independent organization within the Atlas Copco Group. Currently with 40+ employees, supported by a solid distribution network, the company has a global reach spanning more than 180 countries. For more information, visit [www.gammavacuum.com](http://www.gammavacuum.com).*

#### FIPA Presents New Robust Vacuum Cups

Durable, secure-grip, non-marking: FIPA GmbH, has extended its range with the extremely wear-resistant Monoflex bellows vacuum cups from the SP-BX1 and SP-BX2 series. The vacuum cup material combines the elasticity of rubber with the durability of polyurethane.

The almost non-marking Monoflex bellows vacuum cup is the perfect choice for gripping cartons and other uneven and porous materials, such as cardboard, textured plastics and composites with a raw surface. The vacuum cup is made from extremely wear-resistant polyurethane (hardness 50° Shore A) and adapts perfectly to flat and convex product surfaces. Folds provide good height and angle compensation. Thanks to the excellent resetting the bellows vacuum cup is suitable for applications with short cycle times. The Monoflex bellows vacuum cup is identical in construction to the tried and tested Varioflex® vacuum cup. The SP-BX1 (1.5 folds) and SP-BX2 (2.5 folds) series of the Monoflex bellows vacuum cup are however

targeted at customers in the packaging and plastics sector, who may wish to use the advantages of the Varioflex® vacuum cup, but do not require its flexible sealing lip.

FIPA offers the oil- and ozone-resistant vacuum cups in versions from 10 mm to 75 mm diameter with 1.5 folds (SP-BX1) and 2.5 folds (SP-BX2). Bellow vacuum cups with a filter disc are ideal for use in a dusty environment. On request, FIPA delivers the vacuum cup with integrated filter disc from a diameter of 26 mm. The filter disc is included in delivery from a diameter of 77 mm.

#### About FIPA

*FIPA specializes in vacuum, gripper and lifting technology. The international company develops and sells high-quality products and innovative system solutions for the material flow sector. FIPA GmbH was founded in 1985 and employs around 70 members of staff at its headquarters in Ismaning, near Munich. FIPA also has a global presence, with its own subsidiary in the USA, a representative office in China and a worldwide partner network. For further information on FIPA, see [www.fipa.com](http://www.fipa.com).*



FIPA presents new robust vacuum cups for the packaging and plastics industry.

## Blower & Vacuum Technology News

### Piab Announces New piCOBOT®L Vacuum Pump Unit

Piab has continued to evolve its piCOBOT® program by adding a larger version. Developed with the needs of customers in mind who work with small industrial robots and cobots, its high payload combined with a low building height enables maximum capacity usage.

With its lifting capability of up to 35 lb, the piCOBOT®L is particularly attractive for e-commerce, logistics and warehouse applications as well as for assisting with lifting of heavier items in production. It builds on the same technology platform as the original version, i.e., it consists of a vacuum pump unit and an optional gripper unit. The vacuum pump unit is scalable and can be equipped with a varying number of the newest powerful COAX® cartridge. Offering a significantly higher vacuum performance, it enables fast movement when lifting heavier items for high

productivity in packaging and palletizing, part assembly or machine tending.

Its high vacuum flow further facilitates the deployment of large Kenos® foam grippers that can lift a broad variety of objects, from single large and heavy ones to a multitude of small ones simultaneously. The piCOBOT®L is also an excellent platform for customized end effectors – either developed by Piab’s Custom Line specialists or by the customer or system integrator themselves. Thanks to the vacuum connection at the bottom of the pump no extra cabling is required when attaching a different gripper unit.

While the piCOBOT®L allows manual gripper changes and disassembling the tool from the pump unit, the requirement to speed up tool changes when needed, called for an automated process to ensure continuous operations, provide flexibility for deployment of one

solution for many different tasks at lowest possible cost. Hence, the most important addition is its optional automatic tool changer combined with a docking station for further end-effectors. The automatic tool changer is equipped with a lever to lock or unlock the adapter plate of the end-effector. The lever can be opened and closed automatically by the docking station to remove a gripping unit from the cobot and pick-up and connect a different one without human interference being necessary. Alternatively, the gripper switch at the tool changer can also take place manually.

The piCOBOT®L was developed with easy access to parts that may require cleaning in mind. Accordingly, the ejector cartridges can be extracted in portions and the vacuum stages cleaned where needed. The integration of dust protection filters further maximizes machine uptimes. Thanks to its IP65 compliant robust pump body long operation times are also realized in harsh environments.

#### 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).*



Lifting more with less with Piab’s new piCOBOT®L vacuum pump unit.





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#### 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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#### A Publication of

**Smith Onandia Communications LLC**  
37 McMurray Rd., Suite 104, Pittsburgh, PA 15241

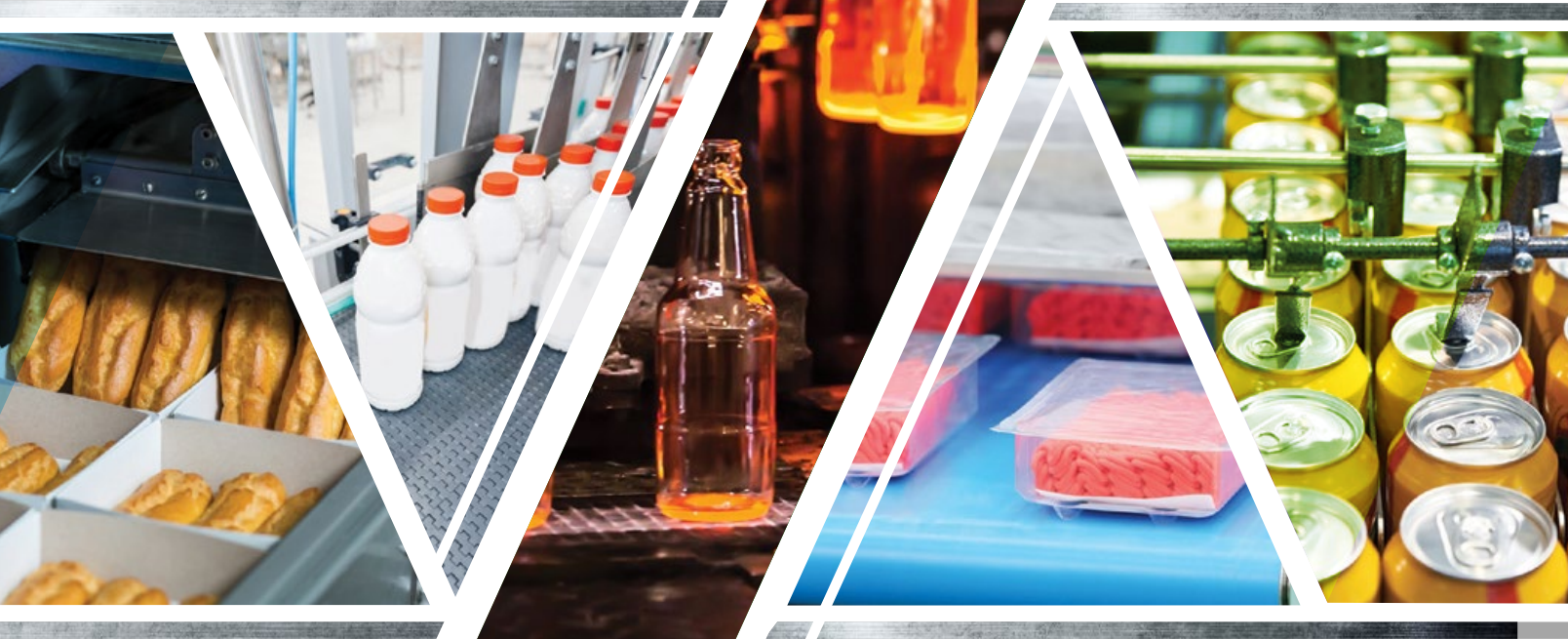
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The Atlas Copco logo is displayed in white text on a blue rectangular background in the top right corner of the image. The background of the entire advertisement is a photograph of a cheese production facility. A worker in a white lab coat, blue gloves, and a green hairnet is seen from the side, reaching for a large yellow cheese block on a stainless steel conveyor belt. The conveyor belt is part of a complex industrial system with rollers and various mechanical components. In the foreground, another worker is partially visible, also handling cheese blocks. The overall scene is clean and industrial, with a focus on the manual and automated aspects of cheese production.

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