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EVERY ISSUE

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FROM THE EDITOR

Compressed Air as a Food Ingredient

This May 2024 Issue has a lot of content for plants in food processing and packaging. The lessons taught apply to all industries, starting with monitoring compressed air quality and compressed air leaks.

Does your plant identify the multiple locations where compressed air is contacting the food product, or its' packaging, which you manufacture in a hygienic manner? Does your plant verify that the compressed air contains no moisture, bacteria, oil or solid particulates at those high-risk locations? Please review the article I wrote on page 36 titled, "Food Packaging OEMs, Vacuum and Air Quality at IPPE," where some of the largest food packaging equipment OEMs express their concerns at average compressed air quality in plants.

Did you know compressed air leaks introduce moisture into compressed air? This is why compressed air quality measurement, at the point of food contact, is critical.

Don Van Ormer has sent us an excellent article titled, "Beyond Leaks-Factory Continues Reducing Compressed Air Demand." If your plant does have an on-going compressed air leak management program, this article is for your maintenance staff.

We have more ideas and articles on how to reduce compressed air use. Air cannons (page 14) and AODD pumps (page 36) can be heavy users of compressed air. Upgrading to newer technologies can significantly reduce compressed air use.

We are now accepting speaker abstracts for the Best Practices 2024 EXPO & Conference, taking place October 29-31 in Atlanta at Cobb Galleria. Please mark your calendars to visit us! https://cabpexpo.com/conference/speaker-submission/

Thank you for investing your time and efforts into ***Compressed Air Best Practices.***

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Compressed Air Industry News

JHFOSTER Acquires HTE Technologies

John Henry Foster Minnesota, Inc. (JHFOSTER), a strategic collection of engineers, support and service teams, compressed air experts, and automation and robotics solutions provider, has announced the acquisition of HTE Technologies, a leading automation supplier operating in Kansas, Missouri, and Illinois. To be run as an independent division of JHFOSTER, the company will continue to serve its existing customer base, operate under its existing brand, and remain at its headquarters in St. Louis.

This acquisition accelerates JHFOSTER's ongoing expansion in the manufacturing and automation industry and will bring numerous benefits to customers and employees of both entities.

Nicholas W. Martino, CEO of JHFOSTER, said, "We are thrilled to welcome HTE to our team as this acquisition is a pivotal moment for both JHFOSTER and HTE. More than just the combination of two companies, adding HTE to our group of businesses will help bolster our collective capabilities and enhance the customer experience by providing access to more robust resources, products, and solutions."

This acquisition, an essential milestone in JHFOSTER's growth strategy, expands its geographic footprint to become the trusted source for compressed air, robotics, and automation with operations in nine states. Over the past year, JHFOSTER has made significant acquisitions in the automation space, including Accu Tech USA, Celco, and DevLinks.

"HTE Technologies, backed by our incredibly skilled engineering, sales and service teams, has significantly contributed to the advancements in manufacturing processes and overall productivity gains for more than six decades," said Jason Price, President of HTE Technologies. "Joining JHFOSTER enables us to deliver enhanced value to our customers and expand our technology and service offerings to make an even greater impact across our diverse market segment and the thousands of loyal customers we have been fortunate to serve."

JHFOSTER has acquired HTE Technologies, which will be run as an independent division of the company.

Customers of HTE will continue to receive the exceptional service they are accustomed to, now broadened by JHFOSTER's comprehensive range of resources and solutions. This enhancement includes advanced integration, engineering services, and a dedication to ensuring optimal performance tailored to specific applications.

About JHFOSTER

Headquartered in Eagan, MN, JHFOSTER is a strategic collection of industry-leading compressed air experts, skilled engineers, support teams, and distributors of automation & robotics. Specializing as a provider in automation motion control, compressed air, and robotics, JHFOSTER is dedicated to advancing technology, driving innovation, and delivering comprehensive solutions nationally and globally. For more information, visit www.jhfoster.com.

About HTE Technologies

Manufacturing productivity is what HTE Technologies has been focused on for 65 years as a leading Midwest expert in factory automation, traditional and collaborative robotics, machine vision, compressed air systems, and with its unmatched rental compressor resources. HTE's experienced engineering, programming, fabrication, sales, service, and rental resource teams are all backed by large local inventories of products from industry-leading equipment manufacturers. With HTE's own innovative means of helping customers overcome CAPEX budget shortfalls, such as rent-to-own, robots-as-a-service (RaaS), and compressed-air-over-the-fence plans, HTE helps to ensure that customers have access to advanced technology solutions as they compete globally. For more information, visit www.htetech.com.

Dave Sullivan Celebrates 25 Years at Atlas Machine & Supply

Atlas Machine & Supply is proud to announce and celebrate the 25-year milestone of Dave Sullivan, current President of the Industrial Products Group (IPG) – Compressed Air Division. Dave's incredible journey with the company began on March 8, 1999, when he joined the Cincinnati facility as a truck driver. His unwavering commitment and exceptional leadership have since propelled him through various roles within the organization.

Dave Sullivan, President of the IPG – Compressed Air Division at Atlas Machine & Supply, celebrates 25 years with the company.

Compressed Air Industry News

Dave's initial week as a truck driver quickly evolved into a pivotal role in IPG service support. Over the years, Dave has contributed significantly to Atlas, holding positions such as Service Administrator, Service Manager, and Rental Manager.

In 2010, Dave assumed the role of Vice President of IPG, overseeing the expansion of Atlas into Indianapolis, Nashville, and Lexington. Simultaneously, he played a key role in establishing a dedicated oil-free group within the IPG Division. Under his leadership, the IPG's financial performance has soared from approximately $11 million in 2010 to an impressive $36 million.

After a proven track record of success and growth, Dave ultimately moved into the role of the President of IPG in 2023.

One of Dave's standout achievements was navigating the transition from a long-time OEM partner, Gardner Denver, to Sullair in 2018. His strategic decision-making and adept leadership ensured a seamless transition, further solidifying Atlas's position in the industry.

Reflecting on his tenure, Dave said, "I try every day to make people laugh whenever I can. I've hired a lot of people much smarter than me to make us successful!" His commitment to fostering a positive workplace culture has undoubtedly contributed to Atlas's success.

Atlas Machine & Supply expresses its deepest gratitude for Dave Sullivan's quarter-century of service and dedication. Dave's impact on the company has been immeasurable, and his leadership has taken the IPG Division to new heights. As we celebrate this milestone, we look forward to many more years of collaboration and success with Dave at the helm.

About Atlas Machine & Supply

Atlas Machine & Supply, Inc. is a fourth-generation family business established in 1907, renowned for its excellence in the industrial services industry. The company re-engineers, repairs, and manufactures complex manufacturing equipment, and is an expert in all compressed air services, products, rentals, repairs, and more, for the region. With a passion for excellence and a legacy of success,

the company continues to lead the way in machining and compressed air solutions. For more information, visit https://www.atlasmachine.com.

Atlas Copco Appoints New President of Compressor Technique

Atlas Copco Group has appointed Philippe Ernens President of the Compressor Technique business area and member of Group Management, effective May 1st, 2024. Philippe Ernens is currently President for the Oil-free Air division within Compressor Technique.

"Philippe has broad experience, excellent technical competence and is an appreciated leader," said Mats Rahmström, President & CEO of the Atlas Copco Group. "He also has a strong record of delivering business results."

Philippe Ernens, a Belgian citizen, started as a product engineer in the Airtec division within the Compressor Technique business area in 1995. After several positions as team leader and engineering manager, he became General Manager and continued to a role as Vice President Operations High Pressure. In 2012 he became President of the Airtec division and in 2016 he took up the position as president for the Oil-free Air division.

Philippe holds a degree in Electromechanical Engineering from the University of Liege, Belgium. He will be based in Antwerp, Belgium. Philippe succeeds Vagner Rego, who as previously communicated will take up the position as President and CEO for the Group.

Philippe Ernens, President of the Compressor Technique business area, Atlas Copco Group.

Compressed Air Industry News

In 2023 Compressor Technique had revenues of MSEK 75 552. The business area has almost 24,000 employees.

About Atlas Copco Group

Atlas Copco Group enables technology that transforms the future. We innovate to develop products, services and solutions that are key to our customers' success. Our four business areas offer compressed air and vacuum solutions, energy solutions, dewatering and industrial pumps, industrial power tools and assembly and machine vision solutions. In 2023, the Group had revenues of BSEK 173, and at year end about 53 000 employees. For more information, visit www.atlascopcogroup.com.

Rogers Machinery Company Appoints New President

Rogers Machinery has appointed Chris McKillop President of the company. Chris McKillop started with Rogers Machinery in 1994 as an inside sales representative for the company and oil-free KNW Series group. In 1997, he served as Corporate Administrator and Corporate Counsel before becoming the Vice President of Corporate Administration for 18 years. He moved into his most recent role as Executive Vice President in 2020 before assuming the position of President.

Chris McKillop, President, Rogers Machinery Company, Inc.

"We are excited and confident about promoting Chris McKillop to President of Rogers Machinery Company, Inc. He has had an exemplary 30-year career here at Rogers with a wide range of responsibilities: Sales, Legal, Risk Management, Property Management, Healthcare and Retirement Program, Payroll and Human Resources. He is dedicated and creative and will lead us as we continue to grow our business with a focus on serving our customers, employees, vendor partners and the greater communities where we operate," said Andrew Ragen, CEO.

Chris is based in Portland, Oregon at the corporate headquarters and succeeds Andrew Ragen who retains the role of CEO for the company.

About Rogers Machinery Company, Inc.

Rogers Machinery Company, Inc., founded in 1949 by WWII veterans Ned Rogers and Walter M. Novak, is a veteran-founded and veteran-owned company dedicated to providing high-quality process and plant utility equipment including compressed air, vacuum and pump systems and services. With a nationwide presence and branches in 13 states, Rogers Machinery is committed to innovation, excellence, and unmatched customer service. For more information, visit https://rogers-machinery.com.

Power Equipment Direct Partners with Kaishan USA

Power Equipment Direct has partnered with Kaishan USA to offer a wide breadth of high-performing commercial and industrial air compressors. The partnership promises to streamline costs and lead times for end users while providing some of the most efficient rotary screw air compressors on the market.

Kaishan air compressors serve a wide assortment of industries, including machining, metalworking, food production, packaging, automotive, and many more. Lean manufacturing and vertical integration allow for streamlined costs and fast lead times on these units.

"Here at Kaishan, we're trying to maintain a very reasonable market price for high-quality products, despite being in an industry that has seen prices rise roughly 25% in the past few years," said Dave George, President of Kaishan USA.

Key to this ability is Kaishan's large manufacturing capacity and vertical integration. The U.S. business is currently expanding its state-of-the-art manufacturing facility in Loxley, AL., to 130,000 sq. ft. It is 85% vertically integrated, giving it almost complete control over the supply chain, component costs, and quality. This allows Kaishan to deliver premium quality products at affordable prices while having some of the fastest lead times in the industry.

Kaishan and Power Equipment Direct will collaborate to bring top-of-the-line, efficient rotary screw air compressors to a wide assortment of industries, including machining, metalworking, food production, packaging, automotive, and many more.

Among the initial offerings will be the 15 hp KRSB belt drive rotary screw air compressor with an integrated tank and dryer. Designed for manufacturing, automotive, and heavy industrial applications, this belt drive unit requires a low capital investment thanks to Kaishan's vertical supply integration and lean manufacturing methods.

End users can also expect a world-class 12-month standard warranty on complete air compressor packages.

Kaishan is a member of the Compressed Air and Gas Institute (CAGI) as well as its Performance Verification Program. This third-party testing program validates performance claims made by rotary screw air compressor manufacturers like Kaishan.

"By belonging to this testing program, all of our air compressor performance claims are independently verified, so you can trust what you're getting," said George.

"Kaishan has a stellar reputation in the air compressor industry, which is why I'm thrilled about this partnership," said Drew Dudek, Category Manager at Power Equipment Direct. "Together with Kaishan, we look forward to exceeding the expectations of the growing

Thanks to vertical integration, Kaishan can reduce costs and hasten delivery in an inflationary air compressor industry.

Compressed Air Industry News

commercial air compressor market in terms of quality, affordability, and lead time."

About Kaishan

Kaishan Compressor USA is a diversified industrial equipment manufacturer centering around rotary screw technologies. Based in Loxley, Alabama, Kaishan USA operates an expansive state-of-the-art manufacturing facility that was built using lean manufacturing methodologies to provide the industry's best lead times. For more information, visit https://kaishanusa.com.

About Power Equipment Direct

Since 2002, Power Equipment Direct's mission is to "Make buying technical products simple." Utilizing industry-trained product experts, its wide selection of power equipment and HVAC products, and its U.S.-based support team, Power Equipment Direct provides a streamlined shopping experience designed to save customers time, money, and hassle. For more information about Power Equipment Direct, visit https://www.powerequipmentdirect.com.

Jay Mottley Joins Tamturbo as Director of Sales, North America

Jay Mottley has joined Tamturbo as the Director of Sales, North America. Jay comes to Tamturbo with extensive experience in Compressed Air. Jay and his brother owned one of the largest Ingersoll-Rand distributors for compressed air equipment and systems in the United States. After selling their business, he has worked for multiple large manufacturers in sales of compressors and air systems.

Jay Mottley joins Tamturbo as Director of Sales, North America, bringing extensive compressed air expertise.

Jay has an exceptional expertise, especially in oil-free air compressors, their applications and customer needs. He has worked closely with Channel Partners (Distributors) and end users. Before coming to Tamturbo, Jay worked as a National Sales Manager for Atlas Copco high pressure gas compressors.

About Tamturbo

Tamturbo was founded in 2010 around the idea that the world needs a more environmentally friendly alternative to producing compressed air. Our unique technological advances have brought to life a range of compressors that far surpasses the legacy technologies both in performance and in significantly lower life cycle cost. Our technology is delivered globally in cooperation with multiple channel partners. Our 100% Oil-Free units with years in 24/7 operation have proven full reliability and zero maintenance without any risks of compressed air contamination. In the end, we provide exactly what the customers need – Just Air. For more information, visit www.tamturbo.com.

Prevost Earns ASME Certification for Supplier Quality Program

Prevost Corporation, an international manufacturer of pneumatic equipment, is pleased to announce that it has obtained The American Society of Mechanical Engineers (ASME) Quality Program for Suppliers (QPS) General Industry certification, Certificate QPS-1, a world-first.

For over 45 years, Prevost has been designing and manufacturing a comprehensive range of products for compressed air and fluid distribution systems. Innovation and quality have always been the central pillars of the company, which is headquartered in Europe and operates in over 80 countries. The entire Prevost team, who are constantly striving to demonstrate the quality and conformity of its processes and products, took another industry-

Prevost earns ASME certification for their Supplier Quality Program.

Compressed Air Industry News

leading step by obtaining the first in the world ASME QPS General Industry certification.

As a manufacturer of pipe fittings and subassemblies for compressed air and pressurized fluid systems, Prevost underwent a long and rigorous certification program and demonstrated once again its commitment to quality processes in all its manufacturing activities, including design, R&D, assembly, and testing. With its certificate QPS-1, the company reaffirms its commitment to supplying quality products to industrial users of compressed air systems and being a key partner for all industrial engineering projects involving compressed air and fluid distribution in North America.

Through rigorous research and development processes, stringent manufacturing operations, and thorough quality inspections, the Prevost Piping System is the ideal choice for clean air and sterile environments. Their products meet the following international requirements: ISO 9001 for quality management, ISO 8573-1 Class 0.0.0 for air quality, ASME B31.1 & ASME B31.3 for pressurized equipment, Fire Classification UL 723 – ASTM E84, and ATEX approved for gas, areas 1 & 2, then dust, areas 21 & 22.

About Prevost

Since 1978, Prevost has been developing, manufacturing, and marketing a complete range of products suitable for air, fluid, and vacuum systems. Innovation has always been the core value and why the entire team strives to develop professional-grade, safe, and sustainable products. Prevost specializes in safety couplings, blowguns, piping networks, air filtration, and pneumatic equipment. For more information about the company and its products, visit www.prevostusa.com or connect with a Regional Sales Manager by calling 800-845-7220.

Nikita Patel Selected as Women in Compressed Air, Vacuum & Cooling Networking Group Executive Council Member

Best Practices Magazines & EXPO is excited to announce the selection of Nikita Patel as an Executive Council Member of the Women in Compressed Air, Vacuum & Cooling (WCVC) Networking Group. Nikita works as a Sales Engineer at Sherman Engineering Company, a leading manufacturer's representative for Gardner Denver Nash, BeaconMedaes, Gardner Denver Compressors, Elmo Rietschle, and others. She brings nearly 10 years of expertise in compressed air and vacuum system design, collaborating with engineers, contractors, and end users on various projects. She holds a Bachelor's degree in Mechanical Engineering and an MBA with a focus on Strategic Planning for Multinational Businesses. She is also a licensed engineer in PA.

When accepting this role, Nikita commented, "I'm excited to join you all at WCVC! I look forward to all the opportunities this networking group will bring me, especially the chance to share my experiences and knowledge of compressed air and vacuum system with others."

Nikita Patel, PE – Sales Engineering at Sherman Engineering Company, was selected as Executive Council Member, WCVC Networking Group.

Join us in our mission to provide women with personal and professional development opportunities including the ability to establish meaningful connections with their peers, gain valuable industry insight to further their careers and improve their leadership and communication skills. If you are interested in a leadership role within the group and would like to become a member of the WCVC Executive Council, please send an email to Kimberly Hill, WCVC Administrator at kimberly@airbestpractices.com.

About WCVC Networking Group

The Women in Compressed Air, Vacuum and Cooling (WCVC) Networking Group provides support to women who have chosen or are thinking of choosing a career in the compressed air, vacuum or cooling industries and welcomes individuals from every job function – engineering, marketing, sales, human resources, finance, production and every job in between. The WCVC Networking Group offers quarterly virtual meetings and networking opportunities in the hopes of empowering women in the compressed air, vacuum and cooling sectors. The group will meet in-person annually at the Best Practices EXPO & Conference. Apply for your free membership today. Join our LinkedIn group.

About Best Practices 2024 EXPO & Conference

The Best Practices 2024 EXPO & Conference is the leading North American event focused on Sustainable, Safe & Reliable On-Site Utilities Powering Automation. The event takes place October 29-31, 2024 at Cobb Galleria Centre in Atlanta. Attendees come from engineering firms, manufacturing plants and equipment companies responsible for specifying, purchasing, operating, selling and maintaining on-site utility equipment in industrial compressed air, vacuum and cooling water systems. For more information visit cabpexpo.com.

Automation24 Now Offering Norgren Pneumatic Components

Automation24 announces the addition of Norgren pneumatic components to its portfolio, marking a significant milestone in the company's journey. With this strategic move, Automation24 broadens its scope and capabilities to better serve its customers.

Norgren air preparation products currently offered by Automation24 include regulators, filters, combination units (filter/regulator/lubricator), valves, and accessories. These proven air preparation products are built to overcome the common challenges of using compressed air.

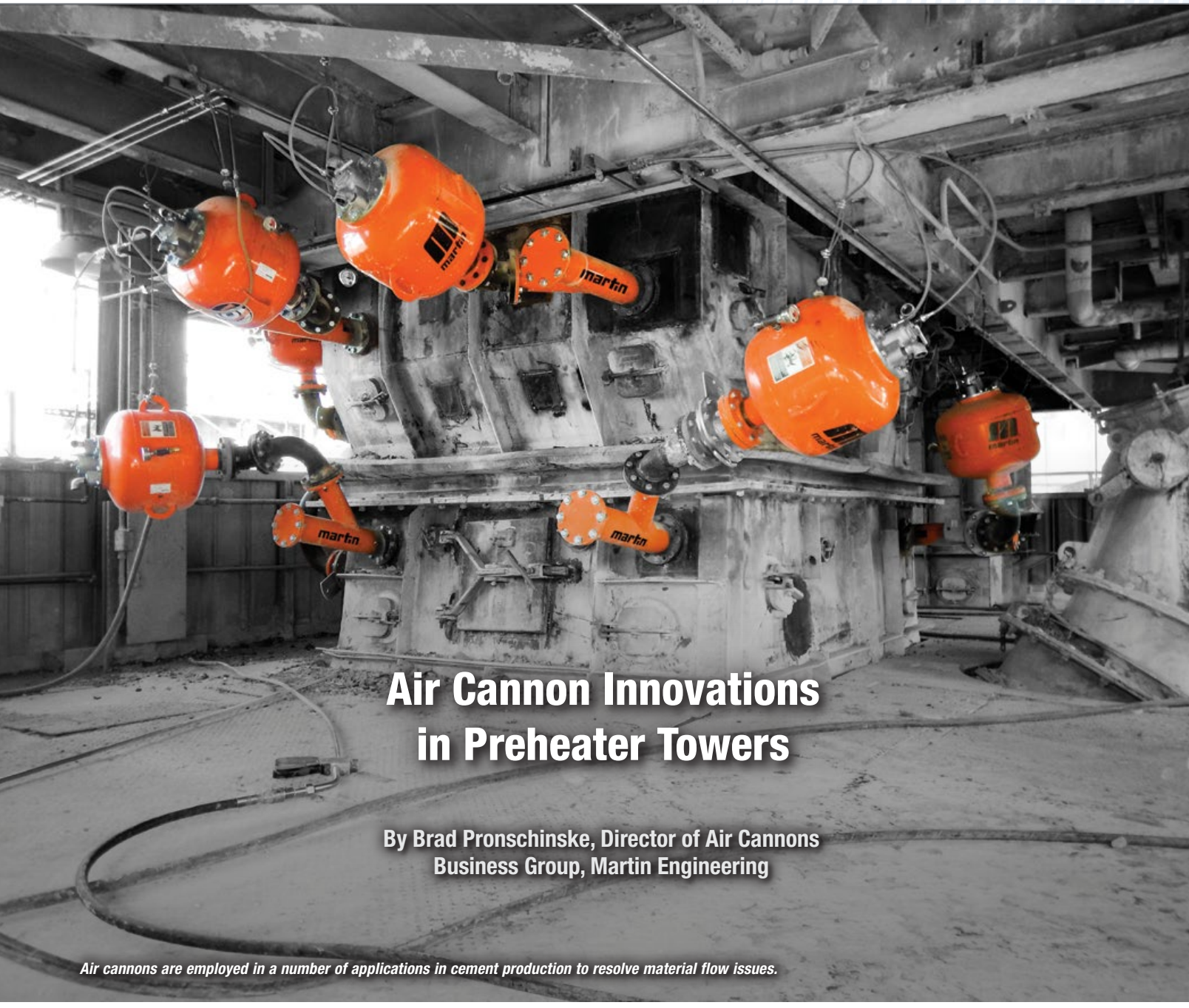
The Norgren Excelon Plus 1/4" PTF combination unit, for example, combines several system-critical components: a 40 µm filter for particle and moisture removal, a high-performance pressure regulator, and a highly effective lubricator. The combination of these elements ensures efficient compressed air control while protecting sensitive equipment and extending the life of all system components.

Additional lines from Norgren will be added throughout 2024, including pneumatic and electric actuators, control valves, vacuum generators, and air preparation solutions for process/food and beverage applications. With this expanded portfolio, Automation24 will ultimately be able to provide customers with a comprehensive suite of Norgren compressed air solutions to meet the demands of applications that include factory automation, material handling, commercial vehicles, rail, life sciences, packaging, process control, and food and beverage.

About Automation24

Automation24, which has its US headquarters in King of Prussia, PA, is at the forefront of the automation industry. The company is passionate about delivering cutting-edge automation solutions to various industries. Extensive expertise and a forward-thinking approach position Automation24 as a leading player in the market. The company's wide range of high-quality products, including sensors, controllers, drives, and other automation components, serve to optimize industrial processes and improve productivity. Automation24 takes pride in its commitment to customer satisfaction and its ability to meet changing market demands. The company is a trusted partner to businesses across America, providing them with reliable and cost-effective automation solutions that enhance their operations and drive success. Automation24 is an authorized distributor of all brands listed in its portfolio. For more information, visit www.automation24.com.

With the addition of Norgren pneumatic components to its portfolio, Automation24 broadens its scope and capabilities to better serve its customers.



Air Cannon Innovations in Preheater Towers

By Brad Pronschinske, Director of Air Cannons Business Group, Martin Engineering

Air cannons are employed in a number of applications in cement production to resolve material flow issues.

An essential part of the cement production process is the consistent flow of bulk materials, as poor material flow can put a stranglehold on a plant's profitability. Accumulations in storage systems and process vessels can choke material movement, causing bottlenecks that create expensive obstacles to equipment performance and process efficiency. Poor material flow also raises maintenance expenses, diverting manpower from core activities. If they become severe enough, flow problems can bring production to a complete stop.

Air cannons have a long history of resolving material flow issues associated with bulk handling. Also known as air blasters, they are employed in a number of applications in cement production, from unclogging hoppers to moving super-heated material through the cooling process. Recent innovations in the engineering, installation, assembly and design of air cannons have been particularly effective in maintaining safe, efficient flow in preheater towers.

"As raw materials travel through the conveying, crushing, calcining, mixing and packaging processes, air cannons are instrumental in maintaining process flow," explained Sid Dev, Martin Engineering Product Manager for Air Cannons. "They function by releasing a powerful shot of pressurized air from a tank through a pipe assembly to a specialized nozzle, removing collected material from surfaces and directing it back into the process stream."

In the preheater, air cannons dislodge buildup from the walls of riser ducts, feed pipes and other locations to avoid clogging and promote the free flow of material. Before their widespread adoption, when operators detected a flow bottleneck, production would be halted and the process shut down for manual cleaning, typically by workers in high heat PPE using air lances, widely considered one of the least desirable jobs in cement production.

Early Technologies

Early air cannon designs exposed several issues, including compressed air consumption, safety and the downtime associated with installation and maintenance. Until recently, cannons relied on air tanks that often weighed hundreds of pounds, with inward-facing valves firing straight across the vessel. To perform maintenance on the valve, the whole tank required removal, involving significant labor and time, and posing potential safety issues due to the weight of the units.

Some equipment created a significant drain on other systems sharing the compressed air system, raising the cost of operation. Older models featured negative firing valves that had the potential to misfire due to drops in pressure, throwing off the firing sequence and further burdening the compressed air system.

In preheater applications, nozzles are still commonly welded to the vessel wall, protruding through the refractory. The abrasive high-heat environment wears them down quickly, with replacement needed in as little as 3 to 6 months in some applications. Each time, a complete cooldown is required, along with confined space entry for the removal and replacement, a process that can contribute to microfractures in the refractory. Further, common pipe nozzle designs can allow material buildup inside the pipe, potentially reducing the cannon's effectiveness and contributing to the need for replacement.

Modern Air Cannon Design

"The last decade has seen a revolution of sorts in air cannon technology," said Dev. "Engineers have gone back to the drawing board and completely reinvented the equipment from the moment air enters the tank to its contact with material. It has become more efficient, cost-effective and safer to service."

Today, design and engineering advancements are producing air cannons that are more compact and lighter, with greater efficiency and power. Suppliers are innovating the way they're built, installed, serviced and powered in order to maximize production and reduce both

These air cannons are strategically located and fired in a specific sequence for maximum effect.

Air Cannon Innovations in Preheater Towers

downtime and the overall cost of operation, while contributing to improved safety.

To extend service life, high heat retractable nozzles are now available for especially abrasive locations, extending into the vessel to fire, then retracting back into the protective pipe. Both the rugged construction and reduced exposure to punishing environments extend nozzle life. They are also designed to be easily removed from a flange by a single worker and serviced as individual units outside of a Y-pipe assembly, without shutting down production. The new Y-pipe is intended to be a long-lasting, permanent addition to the preheater, allowing all the components (including the tank, valve and nozzle) to be mounted and maintained externally without disruption of the vessel wall or costly downtime. When space considerations are an issue, a special tee is also available as an alternative to the Y-pipe, so technicians can stagger the positioning of the cannons to accommodate tight spaces. Together, these new component options create a modular system that delivers unprecedented ease of access and serviceability.

The new tank designs generally range from 35 to 150 liter capacity, and deliver more force output with less air consumption at half the size of previous designs. Units fire a shot of air at up to 120 PSI (8.27 BAR) from the pressurized tank, with an effective area of up to 22.6 ft^2 (2.10 m^2). At the heart of the system is the valve assembly, which requires regular inspection and occasional service or replacement. To avoid the need for tank removal and confined space entry, engineers have designed new cannons with outward-facing valves. This provides easy access by a single worker from outside the vessel.

To prevent the risk of unintentional firing due to sudden drops in pressure, the new positive-firing valves require an air pulse signal from the solenoid to trigger discharge. Safely located up to 200 feet away from the highest heat areas, solenoids can be connected to a plant's central control room, allowing operators to maximize results by monitoring and adjusting firing sequences from a remote location. The cannons can also be fired manually.

Core drilling during production by a trained technician.

Installation Innovations

"Bringing material up to temperatures as high as 2400°F (1315°C) takes a tremendous amount of energy," said Dev. "The cost of downtime for cooling the preheater tower, performing the work and reheating the kiln is astronomical. The ability to avoid shutdowns and yet safely service these systems has been a fundamental priority in new equipment designs."

Martin Engineering was the original inventor of low-pressure blasting with plant air for improved bulk material handling, and the firm has recently commercialized a patented new technology for installing air cannons without a process shutdown. The system allows specially-trained technicians to mount the units on furnaces, preheaters, clinker coolers and in other high-temperature locations while production continues uninterrupted.

Specialized core drill bits are engineered to create the exact diameter hole at the precise angle needed. Once a core is safely installed in the vessel wall, an isolation gate is inserted to protect from heat and blowback. Trained technicians then attach the Y-pipe assembly with no downtime or process disruption. The technology dramatically reduces expensive downtime associated with traditional installation methods, which require that high-heat processes be halted to allow core drilling and mounting of the cannons.

Case Study: Chittor Cement, India

The Chittor Cement Plant in Northwest India had considerable residue buildup in the kiln inlet and riser ducts of its preheater tower, and the manual cleaning schedule struggled to keep up. If left untreated, the accumulation would clog the duct and bring production to a halt in order to remedy the problem. To address the

issue, plant managers initially installed ten massive air cannons, 150-liter and 300-liter models weighing hundreds of pounds apiece, which could only be moved with a crane. Each was connected to straight pipe assemblies with fan jet nozzles set into the refractory.

Operators discovered that the large tanks overtaxed the plant's compressed air system, without completely resolving the problem. As a result, they were forced to continue manual cleaning, losing valuable production time as workers in protective gear braved the unpleasant conditions. In addition, because of the abrasive high-heat environment, the fan jet nozzles failed quickly. Replacing the nozzles required certified workers to enter the confined space, resulting in excessive downtime, and the

The old 150 L cannons with fixed pipe assemblies.

Air Cannon Innovations in Preheater Towers

Two 70-liter cannons on Y-pipe assemblies, the bottom one fitted with retractable nozzle.

frequent replacement disrupted and degraded the refractory lining. Managers sought a safer, more sustainable solution that effectively removed the build-up.

Martin Engineering India was invited to examine the issue and offer a solution. Technicians removed the large, unwieldy tanks and installed eight 70 liter Martin Typhoon Air Cannons, 6 fixed nozzles and 2 retractable nozzles. Using innovative core-drilling technology, the preheater tower remained operational as the holes were drilled and the Y-pipe assembly was welded to the duct wall.

"The Typhoon features a hybrid valve concept that provides more force with less air using only one line to fill the tank and trigger the valve. Mounted on a permanent Y-pipe assembly, the tank has an outward facing valve, allowing easy access for maintenance," observed Flow Aids Business Leader Jayesh Patil. A flange secures the nozzle inside the assembly, making replacement and maintenance a one-person job with no system downtime. The retractable nozzles feature a 360° head that withdraws after firing, protecting it from abrasion and extreme temperatures.

After 6 months of operation, workers and managers report being happy with the performance. "The higher-efficiency tanks have reduced the burden on the compressed air system by about 50%, allowing the plant to easily supply all of the new cannons," Patil

said. "The equipment life of the nozzles has also increased, while nozzle maintenance and replacement requires fewer man-hours, with no process downtime." The plant subsequently placed an order for 21 more sets of cannons and nozzles for other locations in the process, as well as five extra nozzles to retrofit existing cannons.

"The safety and ease of maintenance have improved plant performance," said an operator involved in the project. "The lower labor cost and increased uptime offer an excellent return on investment."

Conclusion

Preheater tower downtime is costly in cement processing, both from a production and energy standpoint. Old air cannon solutions raise labor costs and put workers at potential risk in a daunting job that degrades morale. Operators are now able to implement a long-term strategy using modern air cannon technology that improves safety, mitigates downtime, increases efficiency and reduces the overall cost of operation. BP

All photos courtesy of Martin Engineering

About the Author

As Global Product Manager–Flow Aid Division, Bradley Pronschinske is responsible for the development and management of Martin Engineering's air cannon products and vibration systems. Brad joined Martin Engineering in 1998 as a Product Specialist–Air Cannons, became Global Product Manager–Air Cannons in 2005 and continues in that role today. He holds many US and International patents on air cannon models with additional patents on nozzles for air cannon systems. Pronschinske received his BS in Electronics Engineering from Hamilton Technical College in Davenport, Iowa.

About Martin Engineering

Martin Engineering has been a global innovator in the bulk material handling industry for more than 80 years, developing new solutions to common problems and participating in industry organizations to improve safety and productivity. The company's series of Foundations books is an internationally-recognized resource for safety, maintenance and operations training, with more than 22,000 print copies in circulation around the world. For more information, visit www.martin-eng.com.

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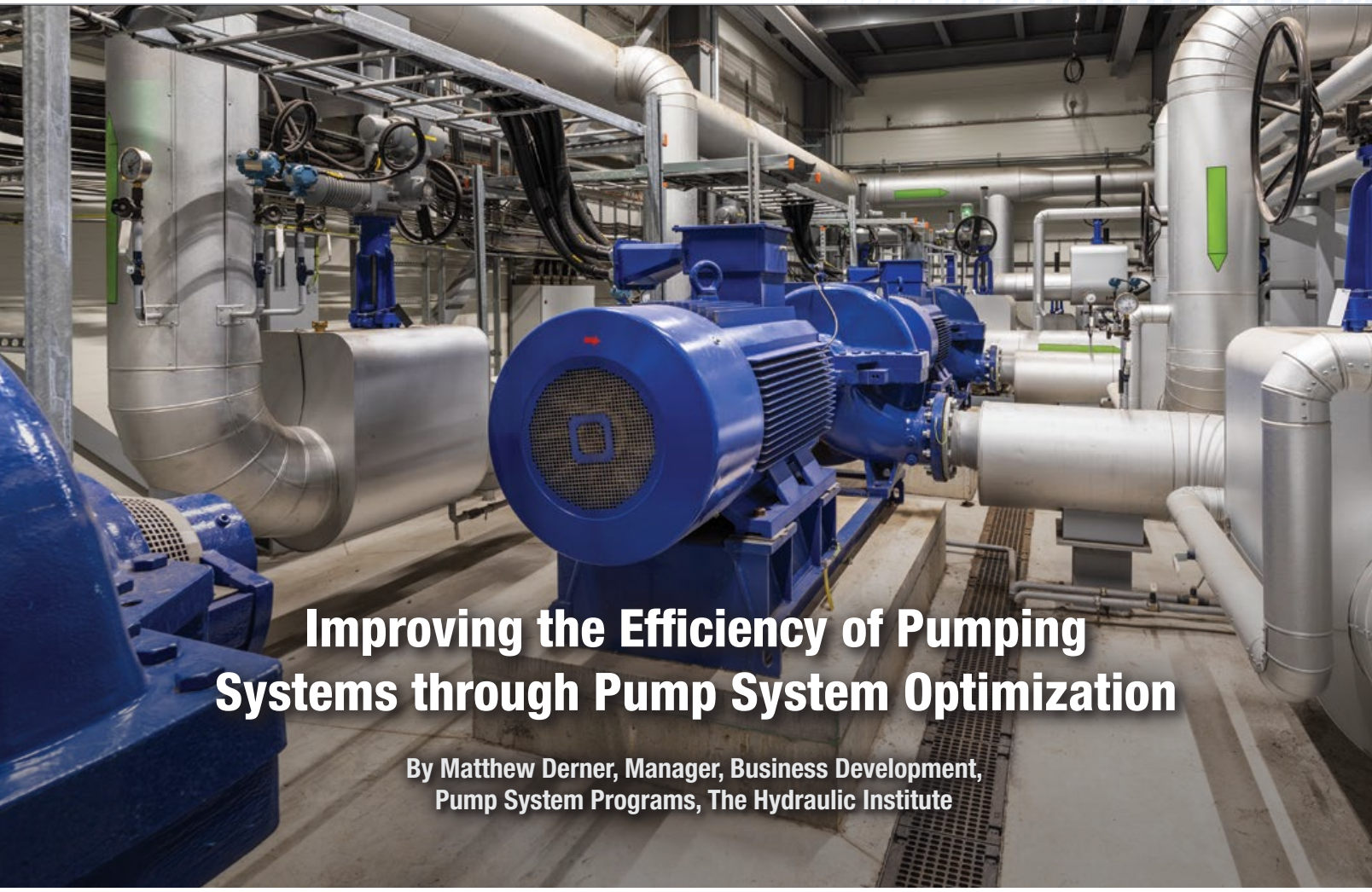


Improving the Efficiency of Pumping Systems through Pump System Optimization

By Matthew Derner, Manager, Business Development, Pump System Programs, The Hydraulic Institute

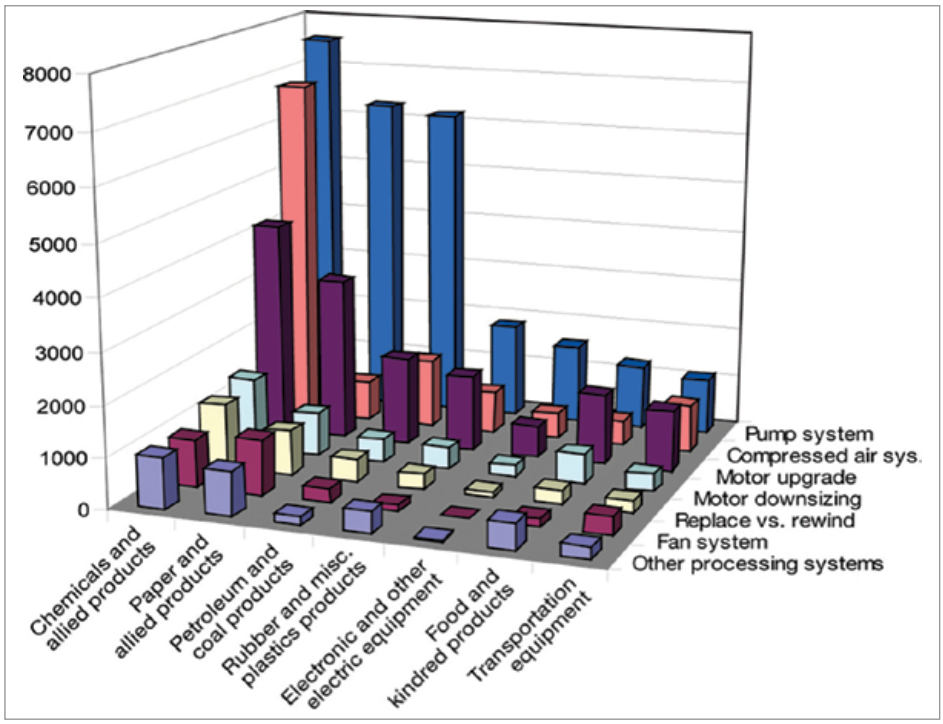
The Hydraulic Institute (HI) defines pump system optimization as follows:

"The process of identifying, understanding and cost-effectively eliminating unnecessary losses while reducing energy consumption and improving reliability in pumping systems, while meeting process requirements, minimizing the cost of ownership over the economic life of the pumping systems."

Getting there is a process that requires a few steps. For utilities to mine energy efficiencies while optimizing their clean water pump systems, they need to do the following:

See the Bigger Picture

The U.S. Department of Energy's 2002 Motor Market Assessment established that pumping systems offer the greatest optimization potential



Source: U.S. Industrial Motor Systems, Market Opportunities Assessment, U.S. Department of Energy

of all types of fluid systems, with potential savings up to 75% and an average net savings of 20.1%.

Maintaining the balance and correlation between spend and output is essential: Either a reduction in spend or an increase in output boosts optimization. However, if the pump system can minimize utility costs via reduced consumption of water and energy in a way that does not compromise reliability or output, optimization is achieved.

Power utilities may incentivize system optimization by subsidizing assessment costs and providing rebates that cover a portion of the energy savings upgrade. In fact, HI recently launched digital resources to assist utilities in establishing and maintaining incentive programs to assist in overall energy reduction.

It's important to understand that all pumps are selected to meet system requirements – never the other way around. Once the application is determined, engineers can assess criteria, which vary greatly between different uses. For example, a condensate pump intended to pump saturated water requires different flow rates and design attributes than a cooling water pump. The energy consumption required for any system depends on the flow rate of the entire system including the pressure (head) and how often the pump(s) are operating.

When it comes to pumps, energy and cost savings for utilities will vary depending on a variety of factors for different settings, but properly selecting pumps and ensuring they have an HI Energy Rating Label will increase the savings.

By reviewing the entire system and not just the individual pump, engineers and specifiers lay the foundation to select the right pump or system for the application and the proper control methodologies to manage the flow of energy and ensure reliability.

Build the Best Assessment

To achieve optimization in an existing pump system, it's important to start with an assessment. Proper assessments provide a host of results to justify costs for improvements to the system's design, control, operation and

Improving the Efficiency of Pumping Systems through Pump System Optimization

maintenance. Improvements to pump systems for optimization can result in reduced system head (pressure), reduced system flow rate or operating time, more efficient equipment or controls and/or improved installation, maintenance or operation procedures.

This assessment should be built in three levels. First, the paper audit begins with pre-screening and gathering system information for pumping systems. This data draws from equipment information, control schemes, operating parameters, reliability issues, and performance curves. With this information, potential for energy savings can be quantified, and recommendations for level two or three assessments can be made.

Level two assessments entail physically measuring the system for a specific amount of time to provide a snapshot of how the system is operating. It is important to note, however, that a level two assessment will not be sufficient for systems with significant variable flow or pressure over time.

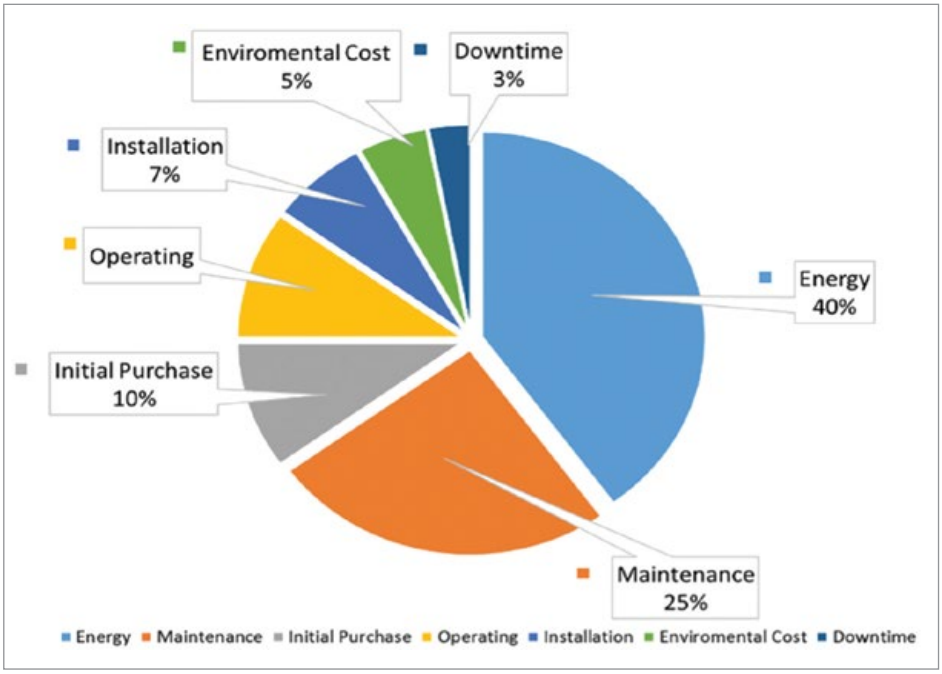
Level three assessments include a longer-term system measurement to establish how the system operates over a period of time. This assessment documents how the system varies so that the complete picture can be seen. This type of assessment is accomplished with the use of in situ monitoring combined with any available historical site data.

Make Energy Efficiency Part of the Cost Assessment

A variety of factors for different settings can affect energy savings resulting in long-term potential for significant cost savings. Upfront costs can often deter specifiers from considering overall savings throughout a pump's lifecycle.

For a typical pumping system, 65% of the total cost of ownership (TCO) is related to energy and maintenance, while the initial cost accounts for only 10%. For example, a double-casing between bearing multi-stage pump (BB5) will cost more than an axially split multistage pump (BB3), but the BB5 is designed for high reliability in high-pressure and temperature applications. Trying to

reduce costs upfront by extending the pressure and temperature range of the BB3 pump could result in a much higher TCO due to maintenance costs. Enhancing the energy efficiency of pumps can also go a long way to save on utilities. To help identify the most efficient pump for the system requirements, the Hydraulic Institute (HI) offers an Energy Rating database for selecting pump types below 200 horsepower.



Build an Assessment Team

It's important to understand that collaboration is essential when undergoing pump system evaluations and assessments. Because of the complexity of such systems, the assessment team should be comprised of personnel from cross-functional backgrounds including:

- Host organization representative that has management support and overall responsibility and ownership
- Assessment engineer with broad pump system analysis competencies
- Specialists on system processes, operations and functions
- Specialists on the maintenance practices and history
- Specialists who can provide the team with cost data

There are certified professionals who can assist with this, known as a Pump Systems Assessment Professional (PSAP). These experts have completed HI's PSAP program, a certification program that sets the standard for the discipline of pump systems assessment and the use of pump system optimization techniques. Professionals with the PSAP certification have demonstrated that they have the requisite

Improving the Efficiency of Pumping Systems through Pump System Optimization

knowledge and experience to perform high-quality pump system assessments.

Identify Optimization Opportunities

To be accurate in the determination of energy consumption, the next step is to evaluate opportunities for efficiency gains in system flow, pressure/head, and pump, motor or drive efficiency and operating time. In existing systems, the energy requirements can be measured over time as a benchmark to aid in identifying where energy consumption can be optimized.

The time for this process may need to account for seasonal variations, so an entire year may be needed. In contrast, a batch process for a system's specific task (e.g., provide 100 gallons per minute [gpm] of water around a reactor to maintain 200 degrees Fahrenheit for one hour), will be a much shorter benchmark because the periodic operation is known and consistent.

Remember that Footprint Matters

Space availability and the pump system's footprint are important factors in the selection process. Given the accessible space, a frame mounted (a pump that has its own bearing frame), close coupled (motor bearings carry pump loads), or inline pump may be appropriate based on the power and speed requirements. However, these options will not have an interchangeable footprint.

Think Smart

Consider using smart pumps that integrate a Variable Frequency Drive (VFD), which have the pump performance programed in from the factory, instead of retrofitting with a separate VFD. Both solutions reduce the pump speed to meet a designed set point for greater efficiency and cost savings. However, the more conventional approach of installing a separate VFD requires the additional legwork of installing the VFD near the pump, installing instrumentation and connecting it and programing the VFD, which can also create opportunities for error. Additionally, having the performance of the pump programed into the VFD allows control based on the VFD speed and power, without other external instrumentation.

Carefully Assess Flow Requirements and Fluid Properties

Fouling, corrosion and erosion of pumps and pipes over time can be attributed to biological, chemical, and abrasive factors, so understanding fluid properties can be critical to avoid failure or the need for continuous and costly maintenance. Additionally, fluid viscosity and temperature are also critical considerations in the pump selection process.

For example, positive displacement pumps are often used in the industrial and petrochemical sectors and in many applications with viscous products. These pumps come in many designs, but generally deliver consistent volume with every rotation of the shaft, efficiently handling viscous liquids and delivering a nearly consistent flow against low or very high pressures. A benefit is that adding a variable speed drive allows these pumps to be dialed into a precise flow rate, or possibly have their flow extended to meet future system demands.

Ultimately, selecting the right pump design for the application is vital for efficient and reliable operation. The process designer must have a thorough understanding of the treatment process, its liquid composition, industry standards, and best practices, and must work collaboratively with trusted pump manufacturers to ensure a successful outcome. It is difficult to cover every detail of pump selection procedures, but focusing on what was included in this article ensures you are aware of the most important aspects of pump selection. BP

Matthew Derner, Manager, Business Development, Pump System Programs, The Hydraulic Institute

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"Crazy" Systems & Maintenance

Edited by Troy Dreier, Senior Editor, Compressed Air Best Practices® Magazine

Manufacturing plants perform admirably under "crazy" profit expectations to remain viable. Plants often experience "crazy" staffing and operational budget reductions. Our editorial staff salutes our subscribers who keep on-site utilities up and running reliably every day, with fewer resources at hand. These subscribers requested we publish some observed "crazy" system designs and maintenance practices, present due to budget reductions in plants. Our goal is to raise awareness, providing a learning opportunity and encourage increased investments in staffing and systems.

Reduced Pipe Diameter Accommodates a Flow Meter While Causing Pressure Drop

Albert Williams is a freelance energy auditor and energy engineering training instructor based in South Africa. Visit https://www.linkedin.com/in/albertedwardwilliams/

He writes: "I'll never forget this plant since I visited it over a dozen times. Audit measurements indicated a loss in compressed air pressure and we had to discover why this was occurring. The compressed air supply-side set-up was immaculate, each air compressor was paired with a dedicated dry receiver tank before the dryers. Pressure loss was minimal.

Reduced diameter piping caused significant pressure drop and energy expense. Photo credit: Albert Williams

"We then followed the common manifold header heading straight above the air compressors into a mezzanine, which was only accessible by ladder. This is where we discovered the pictured reduced diameter piping causing the significant flow restriction and pressure drop.

"Why did they do this? It turns out they had purchased an inexpensive compressed air flow meter requiring a smaller pipe diameter and shorter run of straight pipe. It was providing inaccurate real-time data, was not connected to a data logger and had been ignored for a long time. It had only caused a significant pressure drop and higher air compressor energy costs for many years.

"We recommended replacing this piping with a larger diameter and installing a larger insertion-probe type flow meter, with data logging capabilities, in the air compressor room. Gotta love compressed air system audits!"

A Barrier to Good Maintenance

Ruthie Carlo is the Industrial Marketing Coordinator for Northwest Pump, based in Portland, Oregon and with branches across the Western U.S. and Mexico. Visit http://www.nwpump.com

She writes: "Perhaps the sturdy metal yellow bars in this photo were meant to protect this air compressor from all manner of free-roaming hazards found on the plant floor. When one of our Northwest Pump service technicians paid a maintenance visit, he found this barrier also stopped him from getting easy access to the air compressor's airend and most of its vital components. Yes, he was able to reach what he needed by going through the other side, but it added a bit of challenge to an otherwise routine appointment!"

360 degree machine access helps maintenance technicians do their job – but it's not always provided! Photo credit: Ruthie Carlo, Northwest Pump.

Confusing Pressure vs. Flow in the Slovak Republic

Subscriber Dušan Dorčík is the CEO of Doem Compressed Air System, based in Žilina in the north-central region of the Slovak Republic. Visit https://doem.sk

He writes: "I visited a Peugot car dealership and maintenance/repair center where the owner told me he wanted a 12 bar (176 psig) air compressor. I asked him why he needed such high pressure and he said, "It's simple, we need 6 bar (88 psig) for the paint guns and 6 bar for the other applications in the machine shop."

After spending some time explaining to him the difference between flow and pressure and that he only needed a standard 7 bar (103 psig) air compressor, the customer remained unconvinced and insisted upon a 12 bar model. Since the customer is always right, they are now happily operating a 12 bar compressed air system!

Doem Compressed Air System is based in Žilina, Slovak Republic. The city is an important industrial center and the largest city on the Váh river.

Submission Guidelines

We invite our subscribers to send their observed "Crazy" Systems & Maintenance experiences to Troy Dreier at troy@airbestpractices.com. Please send a high-resolution picture as a JPG or PDF file and a note describing the installation, what was wrong and what the solution should be. We will edit the text and remove equipment brand names and references from all materials. If we publish your submission, we'll thank you with a $25 Amazon gift card.

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Readers From Around the World

We salute all Best Practices Magazine Subscribers from around the world who own, operate, maintain, engineer and provide expertise for the on-site utilities (compressed air, nitrogen generation, vacuum, blowers, chillers, cooling towers, pumps) powering modern plant automation. This subscriber-driven monthly column hopes to build community and recognize all subscribers!

In Saudi Arabia, reader Melchor Operiano services a Wye strainer to keep cooling water free from obstruction. Melchor is an environment and sustainability coordinator for Middle East Battery Company. Visit https://mebco.com

There's always something good to read at Fluid-Aire Dynamics. Just ask sales engineer Zach Stewart (left) and national sales director Jeremy Gaitsch (right), spotted in the company's Chicago branch. Fluid-Aire Dynamics specializes in the design, installation, maintenance and repair of industrial and commercial compressed air systems. It delivers outstanding customer support backed by a four-hour emergency response guarantee. Visit https://fluidairedynamics.com

Submission Guidelines

We invite our subscribers to send in pictures so we can see the people who read our Best Practices magazines! Those holding a recent magazine issue will receive first consideration. Please send a high-resolution picture as a JPG or PDF file and a note describing the team and company to Troy Dreier at troy@airbestpractices.com. If we publish your submission, we'll thank you with a $25 Amazon gift card.

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How to Boost the Energy Efficiency of Rotary Screw Air Compressors
Presenter Andrew Smith, P.E., Co-Founder, SMARTCAir – *Sponsored by FS-Curtis/FS-Elliott*
Thursday, January 11, 2024 – 2:00PM EST

JAN 25
ASME PTC13 in Action: Practical Approach to Blower System Performance Testing
Presenter Julie Gass, Lead Mechanical Process Engineer, Black & Veatch and Hiran de Mel, Senior Project Manager and Principal Technologist, Jacobs – *Sponsored by Inovair*
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FEB 08
Centrifugal vs Rotary Screw Air Compressor Performance: Full Load and Part Load Efficiency
Presenter Mike Lenti, Senior Auditor, Compressed Air Consultants – *Sponsored by Rogers Machinery*
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FEB 22
Storage Tank and Pipe Sizing for Large Plants: How to Meet CFM Needs
Presenter Ron Marshall, Chief Auditor, Marshall Compressed Air Consulting – *Sponsored by Unipipe*
Thursday, February 22, 2024 – 2:00PM EST

MAR 07
Sizing Vacuum Pumps and Piping for Various Applications
Presenter Andy Smiltneek, President, Growth Solutions Consultants – *Sponsored by Busch Vacuum Solutions*
Thursday, March 7, 2024 – 2:00PM EST

MAR 21
Control of Distributed Systems with Multiple Air Compressor Rooms
Presenter Tim Dugan, P.E., President, Compression Engineering Corporation – *Sponsored by CALMS Air and Comate Intelligent Sensor*
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APR 04
Refrigerated vs. Desiccant Dryers – Choosing the Right One
Presenter Don Van Ormer, Auditor, APEnergy – *Sponsored by Trace Analytics and BEKO Technologies*
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APR 18
CTI STD-201RS Thermal Certification for Cooling System Heat Rejection Equipment Part 2
Presenter Mike Womack, Thermal Certification Administrator, Cooling Technology Institute
Thursday, April 18, 2024 – 2:00PM EST

MAY 09
How to Identify and Eliminate Artificial Demands
Presenter Tom Taranto, Owner, Data Power Services – *Sponsored by Kaishan*
Thursday, May 9, 2024 – 2:00PM EST

MAY 23
Sensors for Compressed Air Systems: Data Management and Analysis
Presenter Andrew Smith, P.E., Co-Founder, SMARTCAir – *Sponsored by VPInstruments and Kaeser Compressors*
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JUN 13
Advanced Aeration Control for Blowers
Presenter Tom Jenkins P.E., President, JenTech Inc. – *Sponsored by APG-Neuros*
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JUN 20
Simultaneous Cooling & Heating System Design
Presenter Phil Johnston, P.E. Technical Manager, Woodard & Curran
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Presenter Mike Flowe, President, Flowe Nitrogen Systems – *Sponsored by Pneutech*
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JUL 25
Instrumentation and Monitoring for Vacuum Systems
Presenters Emma Larrabee, Marketing Manager and Todd Dunn, Vice President Sales & Marketing, Zorn Compressor & Equipment – *Sponsored by Quincy Compressor*
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AUG 08
How to Diagnose and Fix Common Issues in Rotary Screw Air Compressors
Presenter Tom Taranto, Owner, Data Power Services – *Sponsored by FS-Curtis/FS-Elliott*
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AUG 22
Thermal Performance of Evaporative and Dry Cooling Systems
Presenter Clayton Penhallegon, Jr., PE, Integrated Services Group – *Sponsored by EVAPCO*
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Aeration Blower Sizing and Selection
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Selecting PSA vs. Membrane Nitrogen Generation Systems
Presenter Mike Flowe, President, Flowe Nitrogen Systems – *Sponsored by Pneumatech*
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Presenter Don Van Ormer, Auditor, APEnergy – *Sponsored by Kaishan*
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NOV 21
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Presenter Andy Smiltneek, President, Growth Solutions Consultants – *Sponsored by Rogers Machinery*
Thursday, November 21, 2024 – 2:00PM EST

DEC 12
Compressed Air Leak Detection: Techniques, Methods, Tips, and Tools
Presenter Ron Marshall, Chief Auditor, Marshall Compressed Air Consulting – *Sponsored by Rogers Machinery and Teledyne FLIR*
Thursday, December 12, 2024 – 2:00PM EST

DEC 19
Selection Criteria for Oil-Free Air Compressors
Presenter TBD – *Sponsored by FS-Curtis/FS-Elliott*
Thursday, December 19, 2024 – 2:00PM EST

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Beyond Leaks – Factory Continues Reducing Compressed Air Demand

By Don Van Ormer, Senior Auditor, APenergy

A significant manufacturing operation, in the U.S. Midwest, had successfully deployed a compressed air leak management program. This on-going leak management program, along with tuning the air compressor control system, had delivered energy savings and a more reliable compressed air system.

Plant maintenance and facilities management then asked our firm to identify more ways to reduce compressed air demand, while they continued on with the leak management program.

Our compressed air audit found the following further compressed air demand reduction opportunities. The objective of this article is to provide examples of how plants can further reduce compressed air demand – after having implemented a successful, on-going compressed air leak management program.

All projected savings in this audit reflect an air compressor control system able to translate demand reduction into energy savings. The system operates 8,760 hours per year and the local electric rate was $0.07 per kWh. Average system pressure is 90 psig. Please note, due to article space limitations, this is an excerpt from a larger audit, and should be used only as an idea generator.

Project #1: Compressed Air Leak Survey

Prior to our site visit, plant personnel have aggressively found and repaired a significant number of compressed air leaks. As a result, we found a very small number. Plant personnel have acquired an ultrasonic leak detector able to help them detect, photograph, quantify and record leaks.

Summary of Demand Reduction Projects

DEMAND-SIDE Project and Savings	CFM	Peak kW	kWh	$ Savings	Project Costs
Repair identified leaks and continue leak management program	40 cfm	6.0	52,303	$3,700	$1,500
Install thermal control on vortex controls in control room	18 cfm	2.7	23,536	$1,700	$500
Install venturi nozzle on Grit Blast; remove and plug unnecessary blows	278 cfm (5,431 hours)	66.9	363,505	25,500	$2,000
Remove compressed air blows for Pickling; install two 10-hp low pressure blowers	170 cfm	14.4	125,928	$15,600	$25,000
Install automatic no-air-loss condensate drains	33 cfm	4.9	43,150	$3,000	$5,500
TOTAL	**539 cfm**	**94.9 kW**	**608,422 kWh**	**$49,500 per year**	**$54,500**

Project #1: Compressed Air Leak Survey					
No.	Location	Description	Est Size	Est Cfm	Comments
1	R-1	Push pull fitting	Small	1	
2	R-1	Filter	Small	2	
3	R-1	2 air switches	Medium	5	Sonic air tank
4	R-1	Regulator	Small	3	Sonic air tank
5	R-1	Cylinder	Medium	5	Sonic air tank
6	R-1	Purge regulator	Medium	5	Dryer in east compressor room
7	R-1	Regulator	Medium	5	Crane
8	R-1	Top of filter	Medium	5	2 high kickoff table
9	R-16	Hose reel fitting	Small	2	Dept. 300
10	R-16	Hose reel fitting	Medium	5	Dept. 400
11	R-45	Regulator	Small	3	Reclaim
TOTAL SAVING (cfm)				40	

Most plants can benefit from an ongoing air leak management program, like the one this plant has deployed. Generally speaking, the most effective programs are those that involve the production supervisors and operators working in concert with the maintenance personnel.

A partial survey of compressed air leaks was conducted at the plant and 11 leaks were identified, quantified, tagged, and logged. Potential savings totaled 41 cfm for the 11 leaks that were identified.

Number of leaks	11 leaks
Air reduction	40 cfm
Recoverable savings from air flow reduction	$91.53/cfm yr
Annual electric cost savings with proposed project	$3,661/year
Unit cost of leak repairs ($25 materials per leak and $75 labor per leak)	$135
Overall cost of leak repairs	$1,500

Project #2: Install Automatic No-Air-Loss Condensate Drains

These condensate drains come in a number of varieties, including ones that receive the signal to open from a condensate high level and the signal to close from a condensate low level. These drains waste no compressed air and are the best selection from a power cost standpoint. Their reliability is usually many times greater than the level operated mechanical drains.

Ensure that automatic condensate drains are set up to work effectively. Some guidelines include making sure all drains:

- Are not tied together to a common header
- Can be checked easily for operation
- Are properly "vented" to atmosphere, if necessary
- Are sized, piped "to" and "from" with the full capability to handle anticipated highest humidity weather loads

Beyond Leaks – Factory Continues Reducing Compressed Air Demand

- Include a bypass bleed on the feed pipe
- Can be easily checked to see if they are passing condensate.

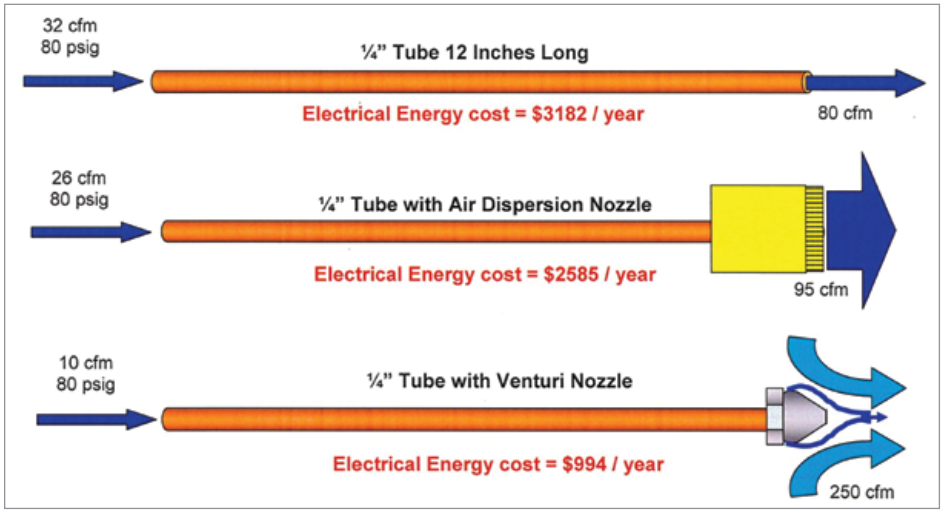
Connect each drainage point (after-cooler, pre-filter, dryer, after-filter, receivers, and all risers) separately to individual drains to collect and direct the condensate to a proper handling point. Be sure maintenance personnel can effectively and visually monitor the drain's action.

Air flow (cfm) savings per drain (each)	3 cfm/yr
Total of number of drains	11
Total compressed air saved	33 cfm
Recoverable energy savings from air flow reduction [Section 2.3]	$91.53/cfm yr
Total annual energy savings (33 cfm x $91.53/cfm year)	$3,020/yr
Cost per drain (materials and installation)	$500 each
Cost of project (11 drains x $55 per drain)	$5,500

Project #3: Open Blows / Blow-off Air

Many plants have "open blows" where turbulent compressed air blasts straight out of the pipe or tube in order to dry a product or "blow off" unwanted materials from a product. This not only wastes huge amounts of compressed air, but also violates OSHA noise and dead ended pressure requirements.

One savings approach is to use an **air amplifier,** which requires less compressed air. Air amplifiers use "venturi" action to pull in significant amounts of ambient air and mixing it directly into the air stream, which amplifies the amount of air available at the point of use. Air amplifiers have amplification ratios up to 25:1. Using 10 cfm of compressed air can supply up to 250 cfm of blow-off air to the process and generate a savings of a 15 cfm compressed air per 1/4-inch blow off. Savings may be available



using 1/8-inch lines, but the cost effectiveness will not be as great.

In many cases, an appropriately selected and applied venturi amplifier will deliver lower net energy cost blow-off air than blower-generated blow-off air. The capital cost for the amplifiers is relatively low.

Tips for Using Air Control Nozzles

- Always select the lowest flow nozzles that will achieve the desired result to maximize air consumption savings and noise reduction.
- Install a pressure regulator and gauge in the air line before the air control nozzles and regulate pressure down to the absolute minimum necessary to achieve the desired result. Lower pressures improve safety, reduce noise, and could save hundreds of dollars a year in electricity operating costs.
- To minimize noise, increase the distance between the target surface and the nozzle, if possible. Remember that noise is caused by air impacting on the target work piece, particularly edges or holes.
- Install adjustable ball joints in the supply line, if required, with air control nozzles to provide simple, accurate adjustment of nozzle orientation.
- Do not aim the nozzle straight at the target for cleaning applications. Angle the nozzle 15° to 45° to ensure that the contaminants are removed from the product surface.
- Most nozzles, in an appropriate material, can be used with CO_2, Nitrogen, steam, or other compatible gases for special heating or cooling applications.
- To create an air curtain, nozzles do not always need to be positioned as closely as on an air knife. Nozzles can be up to 12" (30 cm) apart depending on the application.
- You can aim the nozzle to "wipe" sideways across a moving target at a comparatively shallow angle for many blow-off applications. This can reduce the number of nozzles needed.

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Venturi Inducer Nozzles in Place of Open Blow										
Location		Qty	Type/ Size	Utilization %	Current Application		Proposed Application			Net Savings (cfm)
					Air Flow Capacity (cfm)	Net Usage (cfm)	Recommended Venturi Nozzle	Air Flow Capacity (cfm)	Net Usage (cfm)	
1	Grit blast	64	Lechler	62	14	555	48008	7	277	278
TOTAL						555			277	278

- Angle the nozzle manifold like a snowplow above a moving conveyor so that the contaminants are forced off the belt, rather than back.
- Proper filtration of compressed air is important for efficient nozzle performance. Be sure to use a filter/separator to remove excess oils and water just prior to your nozzle application.

Estimated high pressure air used currently	585 cfm
Estimated high pressure air used saved installation of venturi nozzles	277 cfm
Estimated compressed air saved with venturi nozzles	278 cfm
Recoverable savings from air flow cfm reduction [Section 2.3]	$91.53 cfm/yr
Total electrical energy cost recovery by installing venturi nozzles to reduce blow by	$25,445/yr
Cost of nozzles and installation (62 nozzles x $32 per nozzle)	$2,000

Misapplied Compressed Air

High-pressure compressed air (90-120 psig) being used for low-pressure applications (7-60 psig), is not an efficient use of energy. A close review of the plant's system should be made and measurements taken to identify whether there are any potential energy savings from using an alternate source of low-pressure air for specific applications in the production area. Typical misapplications include aeration and spraying.

In this plant, there are three dip tanks being aerated. Two of them are rinse tanks, being aerated using 90 psig compressed air, and the acid tank is being aerated by a 25 horsepower roots blower at 7 psig. This blower is oversized and is being throttled back.

We estimate approximately 85 cfm is being used in each tank. All tank liquids were "boiling" very well, with a lot of turbulence in the tanks.

Our recommendation is to replace the 90 psig compressed air aeration with the 7 psig low pressure blower system already being used in the acid tank and adding a 10 horsepower low pressure blower able to produce 96 cfm at 10 psig with a maximum working pressure of 17 psig.

Estimated air flow in current low pressure application at 7 psig	170 cfm
Recoverable savings from air flow reduction	$91.53/cfm yr
Annual electric cost in current application	$15,560/year
Electric demand of new unit	11 kW
Annual hours of operation for current equipment	8,760 hours/year
Annual electric cost in proposed application (at 170 cfm and 10 psig)	$6,745/year
Net annual electric savings	$9,665/yr
Total cost to purchase and install a new blower	$25,000

Conclusion

Plant maintenance and facilities personnel should implement on-going compressed air leak management programs. Once up and running, there are many other ways to reduce compressed air demand – beyond leaks. BP

For more information on APenergy visit apenergy.com or call 740.862.4112.

To read similar ***Compressed Air System Assessment*** articles, visit https://www.airbestpractices.com/system-assessments.

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Food Packaging OEMs, Vacuum and Air Quality at IPPE

By Roderick M. Smith, Editor, Compressed Air Best Practices® Magazine

We visited the 2024 International Production & Processing Expo (IPPE) with the objective being to discuss hygienic vacuum and compressed air system designs within thermoforming and other meat/poultry/cheese packaging systems. We were able to discuss the sanitary designs they deploy and some protective measures they have in place, should the manufacturing plant provide compressed air which is not clean and dry and therefore conducive to hygienic manufacturing.

The 2024 International Production & Processing Expo (IPPE) had a terrific year with 1,432 exhibitors covering 620,850 square feet of exhibit space, setting two new records. IPPE is the world's largest annual feed, meat, and poultry and egg industry event of its kind and is one of the 25 largest trade shows in the United States. IPPE is sponsored by the U.S. Poultry & Egg Association, American Feed Industry Association and the Meat Institute.

The 2024 IPPE had 31,353 registered attendees from the poultry and egg, meat and animal food industries. There were 9,063 international visitors, a third new record, from 133 countries represented at IPPE. The largest group from a single country outside the U.S. was Canada, with 14.9% of registered attendees. As in previous years, Latin America had the strongest international presence, representing 45% of international visitors.

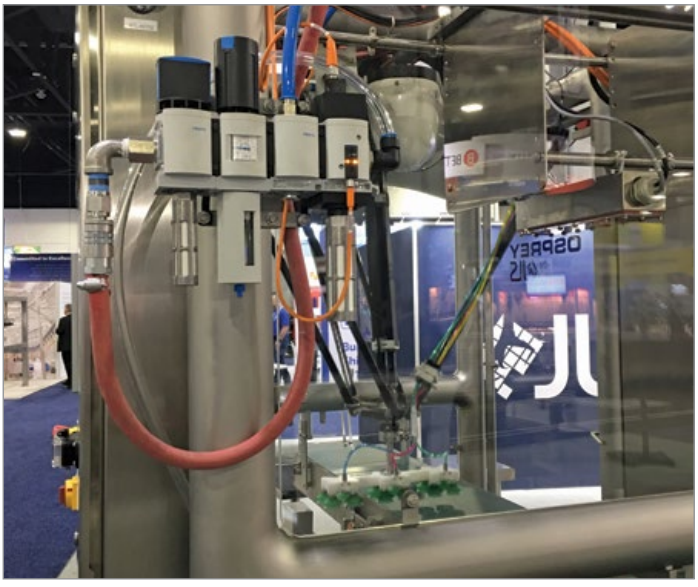
"We are very pleased and excited about our strong attendance numbers and this year's record-breaking trade show floor. The turnout for the 2024 IPPE was outstanding, and the feedback from attendees has been extremely positive regarding time spent on the trade show floor, education sessions offered and opportunities to connect with colleagues and vendors. We expect next year's IPPE to build on this success to ensure we continue to provide

Scott Werner and Meghan Babineaux at the Aerzen Rental booth.

Rob Woodward at the Graco booth with their electric AODD pumps.

Scott Schroeder and Max Mather at the Hixson booth.

The Multivac R105 thermoforming machine



John Kertesz and Garrett Wampler at the JLS booth. Their robotic packaging systems equipment can feature compressed air filtration and pressure regulation units. (left to right)

the best possible experience for attendees and exhibitors," the three organizations said.

A week-long comprehensive schedule of education programs, which updated industry professionals on current issues and complemented the exhibit halls, helped drive attendance. This year's educational line-up featured more than 80 hours of education sessions, ranging from food safety design principles to worker safety to sustainability initiatives for the meat, animal food, and poultry and egg industries, and more.

Compressed Air Purity for Hygienic Meat Packaging

JLS Automation was exhibiting their range of robotic packaging systems, from product loading through case packing, for food-safe meat and poultry packaging. Their machines feature "VOB Vacuum on Board" technology featuring single-stage venturi systems for pick and place. VOB 2.0 was developed in conjunction with Penn State University and the firm states compressed air consumption has been reduced by more than 50% vs. prior field installations. John Kertesz, the Director of Sales for JLS® South said, "Our high-speed VOB technology is virtually clog-free and assures sanitation as there are no clogged airlines to contend with or clean." When

Hygienic Compressed Air and Vacuum Designs in Meat Packaging Automation

asked about compressed air purity they find at manufacturing plants he said, "Although we regularly specify ISO 8573.1 (at specific Quality Classes) compressed air from the manufacturing plants, we often still find water in the compressed air arriving at our machines." For this reason, the JLS Automation systems feature compressed air filtration modules.

A senior sales engineer, at a significant food packaging OEM, requested not to be identified but said, "We often recommend the use of servo-motor driven cylinders (in our machines), instead of pneumatic cylinders, because we can't count on the manufacturing facility to consistently provide clean, dry compressed air."

Sealed Air had a large booth and I spent some time looking at their Cryovac® Auto Load 75 High Speed Bay Loader. At the front end of the machine I could see compressed air blowing a bag open. "We use a high velocity nozzle to give a quick burst to open the bag and then two air amplifiers provide the compressed air volume needed to inflate it," said Sealed Air Mechanical Engineer, Jeff Iocco. He continued, "Since

The Reiser VARIOVAC Optimus featured a rotary vane vacuum pump and compressed air inlet filtration.

The AMCOR MODA VAC with DSS + V supported by rotary screw vacuum pumps.

meat products are then inserted into these barrier bags, we require completely dry, oil-free compressed air to ensure a hygienic system." He explained that for this reason, the Bay Loader features a significant bank of compressed air filters (and a flow meter) on-board to protect the system from impurities, which might arrive from the plant's compressed air system.

There are many laboratory testing and regulatory consulting firms, supporting the meat/poultry/dairy industries with their sanitary and hygienic manufacturing processes. I've spent the last couple of years speaking with many of them and what I've found is that most offer the service of testing compressed air purity focusing on microbiological contamination. Sue Ann Seitz is the Senior Director of Sales for Certified Group, a firm with labs across the country. She said, "Certified Labs has 32 laboratories in North America and we offer compressed air as a service. Our consultants use systems like the Parker CAMTU for compressed air and the Sampl'Air system to ensure there is no microbiological risk coming from ambient air." When I asked her if this was an important part of their business she said, "There are some customers who request this testing, but no there is not a high level of demand."

Most people agreed that acceptable compressed air purity, supplied by the manufacturing plants, is inconsistent and usually unmonitored. The solution being provided by the food packaging manufacturers is to offer on-board filtration systems to protect the food products from contamination.

Hygienic Vacuum Systems in Thermoforming and Chamber Packaging

Vacuum thermoforming machines can use either compressed air or vacuum (or both) to create the pocket where food products are then placed. Kansas City based MULTIVAC is a leading manufacturer. I spoke to their Director of Marketing, Jeff Ray, who has been in the industry for more than thirty years. He said the design trend today is leaning more towards vacuum systems to pull the pocket, as opposed to compressed air pushing to create the pocket. "Multivac leads with hygienic system design down to the smallest details including using different nozzles for compressed air than for vacuum." Clarifying that not every OEM performs hygienic design to this level he continued, "As a leader in thermoforming in medical packaging, we've brought these principals to protein packaging and also make sure we vent out the exhaust valve on the vacuum system." This ensures that no hydrocarbons or contaminants are in the ambient air around the thermoformed trays.

The most prevalent vacuum pump I saw, within the thermoforming machines on display, was oil-lubricated rotary vane technology. Examples were spotted within a MULTIVAC thermoforming system and the REISER Variovac Optimus thermoforming system.

The Amcor Moda Vac high-speed rotary vacuum chamber packaging machine is used for meat, fish, seafood and cheese packaging. As I walked up, I saw two large rotary screw vacuum pumps standing next to the packaging line. There was a gentleman there who turned out to be Shelly Oliverios, from Atlas Copco. "Rotary meat packaging machine OEMs are switching to rotary screw technology to reduce maintenance costs, save energy with VSD's and increase the speed of the machine." When asked how they are able to increase machine output he said, "the system provides two stages of vacuum down to 0.5 Torr and the screw provides more flow per horsepower."

Hygienic Compressed Air and Vacuum Designs in Meat Packaging Automation

An Energy Efficiency Idea – AODD Retrofits

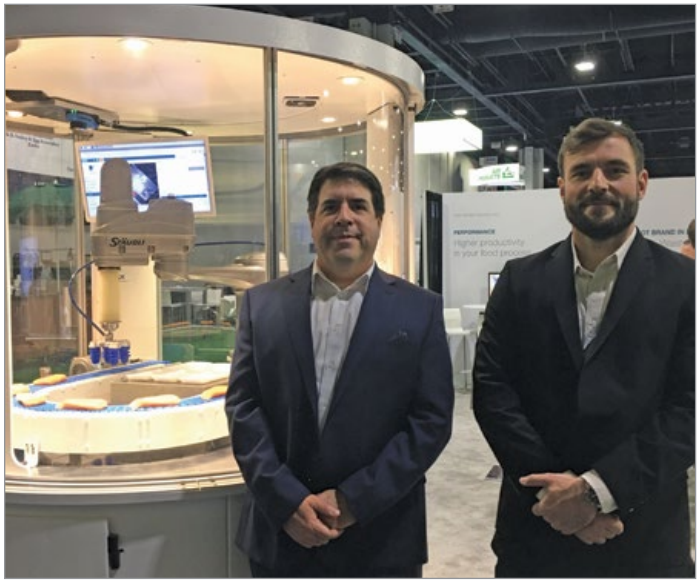
The fun thing about trade shows is one runs into ideas, people and technologies spontaneously. This occurred when I saw the GRACO booth talking about their AODD Husky pump, which uses 30% less compressed air than their prior design. Optimizing AODD pumps is on the short list for factories wondering how to reduce compressed air demand – after they've gotten their compressed air leaks under control.

Now, some knowledgeable readers might say, "hey, that pump was launched in 2010 so big deal." Well, they're right. The real news is Graco's Rob Woodward told me they launched a drop-in replacement, all-electric, AODD pump with patented FluxCore technology featuring a direct drive permanent magnet motor with a control system at the end of 2022 – still old news, but hold on. During the second half of 2024, the unit will accept 480 volts, which according to them is a game changer for installation of retrofits in the field. They say the FluxCore system is 83% efficient vs. 17% for their legacy pneumatic AODD pumps.

Jeff Iocco at the Sealed Air Cryovac booth. Their units feature compressed air filtration, regulation and flow measurement.

Compressed air blows directly into a bag to open it before being filled with product.

Brock Simmons and Shawn Simmons (left to right) at the Multi-Skill Training booth.



Will Sumner and Mathias Konne at the Staubli booth.

John Medemblik next to a Central-Vac Air Purge System at the Walinga booth.

Next year's IPPE will be held Jan. 28 – 30, 2025, at the Georgia World Congress Center in Atlanta. Show updates and attendee and exhibitor information are available at ippexpo.org. BP

About IPPE

The International Production & Processing Expo (IPPE) is a collaboration of three shows – International Feed Expo, International Meat Expo and the International Poultry Expo – representing the entire chain of protein production and processing. The event is sponsored by the American Feed Industry Association (AFIA), the Meat Institute and U.S. Poultry & Egg Association (USPOULTRY).

About AFIA

Founded in 1909, the American Feed Industry Association (AFIA), based in Arlington, Va., is the world's largest organization devoted exclusively to representing the business, legislative and regulatory interests of the U.S. animal food industry and its suppliers. The organization's membership is comprised of more than 650 domestic and international companies that represent the total feed industry-manufacturers of commercial and integrated feed and pet food, ingredient suppliers, pharmaceutical companies, industry support and equipment manufacturers. AFIA members manufacture more than 75% of the feed and 70% of the non-grain ingredients used in the country. AFIA is also recognized as the leader on international industry developments and holds membership in the International Feed Industry Federation (IFIF).

About the Meat Institute

The Meat Institute is the leading voice for the meat and poultry industry. Formed from the 2015 merger of the American Meat Institute (AMI) and North American Meat Association (NAMA), the Institute has a rich, century-long history and provides essential member services including legislative, regulatory, scientific, international and public affairs representation. The Meat Institute's mission is to shape a public policy environment in which the meat and poultry industry can produce wholesome products safely, efficiently and profitably. Together, the Institute's members produce the vast majority of U.S. beef, pork, lamb and poultry and the equipment, ingredients and services needed for the highest quality products.

About USPOULTRY

U.S. Poultry & Egg Association (USPOULTRY) is the All Feather Association progressively serving its poultry and egg members through research, education, communications and technical services. Founded in 1947, USPOULTRY is based in Tucker, Georgia.

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Compressed Air Technology News

Bobcat Announces Lineup of New Products

Bobcat Company, a global equipment, innovation and worksite solutions brand, has expanded its product portfolio with the introduction of forklifts; industrial air compressors; turf renovation equipment; and portable power products including air compressors, generators and light towers.

"Through our unwavering commitment to innovation and excellence, we have significantly broadened our product portfolio to not only meet the needs of our loyal customers but also to inspire and empower new customers to conquer their toughest job site challenges," said Scott Park, CEO and vice chairman of Doosan Bobcat Inc. "With an expanded range of solutions, we're empowering even more customers to accomplish more."

These products are now available at select Bobcat dealerships throughout North America.

Last year, Bobcat announced Doosan Industrial Vehicle, Doosan Portable Power, Doosan Industrial Air and RYAN turf renovation products would change to the Bobcat brand as part of the organization's global brand strategy. All product lines have officially rebranded under Bobcat in North America with transitions on these product lines also happening globally in applicable markets.

Customers can now purchase these Bobcat branded products, which includes:

- Forklifts: Internal combustion cushion and pneumatic tire forklifts, electric counterbalance forklifts, narrow aisle forklifts, pallet trucks/stacker forklifts and warehouse vehicles.
- Industrial air: Industrial air compressors ranging from 30- to 200-hp, with both fixed and variable speed offerings.
- Turf renovation equipment: Aerators, sod cutters, dethatchers, overseeders, and other specialty products that serve landscaping and grounds care professionals across a variety of industries including golf, sports turf, landscaping and rental.
- Portable power: Air compressors ranging from 185 to 1600 CFM, mobile generators ranging from 25 to 570 kVA and light towers with runtime up to 105 hours.

Bobcat's rebrand initiative reflects the company's focus on an expanded portfolio, including forklifts, industrial air compressors, turf renovation equipment and portable power products.

About Bobcat Company

Since 1958, Bobcat Company has empowered people to accomplish more. As a leading global manufacturer, Bobcat has a proud legacy of innovation, delivering smart solutions to customers' toughest challenges. Backed by the support of a global dealership network, Bobcat offers an extensive line of worksite solutions, including loaders, excavators, tractors, utility vehicles, telehandlers, mowers, turf renovation equipment, light compaction, portable power, industrial air, forklifts and industrial vehicles, attachments, implements, parts and services. With its North American headquarters in West Fargo, North Dakota, Bobcat leads the industry with its innovative offerings designed to transform how the world works, builds cities and supports communities for a more sustainable future. The Bobcat brand is owned by Doosan Bobcat, Inc., a company within Doosan Group. For more information, visit www.bobcat.com.

New PEAK Scientific Horizen 24 N_2 Generator

Following the launch of the newest addition to its laboratory gas generator portfolio, PEAK Scientific is pleased to announce it can now take orders for Horizen 24, the most energy efficient nitrogen generator for Single Quad LC-MS.

PEAK Scientific is the industry leader in laboratory gas generators and, with Horizen 24, has brought to market a solution that

The PEAK Scientific Horizen 24 laboratory gas generator.

will save laboratories money, space and environmental impact while enhancing gas quality and reliability.

Designed for Single Quad LC-MS, Horizen 24 combines a number of proprietary technologies to provide the ideal solution for nitrogen gas supply; the culmination of over 25 years' of dedication to manufacturing nitrogen generation solutions for LC-MS.

Horizen 24 has been designed with new technology inside, including heat optimization technology to protect the membrane from water droplets, enhancing performance and reliability in the gas stream. This exciting innovation also houses advanced multi-stage purification to produce ultra-dry, high-purity nitrogen gas for LC-MS analysis.

With demand growing, PEAK Scientific set out to manufacture the most energy-efficient nitrogen generator on the market in the smallest footprint in its class. Using up to 55% less energy, Horizen 24 can save labs on power consumption and with over 50% less heat output, even lab's air conditioning costs can be reduced. Horizen 24 can also help labs to minimize their operational carbon footprint compared to cylinders and equivalent generator models.

"Horizen 24 has truly been a giant leap for us at PEAK in the benefits we can provide to labs around the world with this latest nitrogen generator for Single Quad LC-MS," said Fraser Dunn, PEAK Scientific's Head of Design Engineering. "The generator has been fitted with a number of new technologies which have been rigorously tested to achieve better energy efficiency than any other single quad nitrogen generator on the market. We've not only reduced the cost of ownership for labs, we've produced a nitrogen generator that is significantly smaller than its predecessor without compromising on quality, reliability or purity."

About PEAK Scientific

Established over 25 years ago by founder and Chairman Robin MacGeachy, PEAK Scientific is a leading innovator in the design, manufacture and support of high performance gas generators for analytical laboratories, with direct operations in every continent around the world. For more information, visit www.peakscientific.com.

ControlAir Debuts the Type 410 High Precision Pressure Regulator

ControlAir, a manufacturer of precision pneumatic and electro-pneumatic control products, announced the introduction of the Type 410 High Precision Pressure Regulator. The Type 410 provides a high level of regulation accuracy and repeatability during variable operating conditions.

Designed with precision and reliability in mind, the Type 410 serves as a cost-effective yet highly efficient solution for controlling industrial processes. Despite its superior performance, the Type 410 remains an economical choice, making it perfect for high-volume OEM applications where cost-effectiveness is paramount.

With its superior regulation characteristics, the Type 410 consistently meets control requirements, even amidst fluctuating operating conditions. Built to withstand the harshest industrial environments, the Type 410 features die-cast housings protected with a chromate finish and epoxy paint, ensuring long-lasting durability and performance. Every regulator undergoes rigorous pressure, leak, and flow tests at the factory before shipment, guaranteeing exceptional quality and reliability straight out of the box.

The Type 410's combination of stability, reliability, and precision makes it well-suited for a wide range of industrial applications where precise air pressure regulation is critical to performance and productivity. Applications

The Type 410 is ideal for applications that require precise and stable air under variable operating conditions.

Compressed Air Technology News

include pneumatic control systems, pressure testing equipment, HVAC systems, laboratory instrumentation, and packaging machinery.

The Type 410 High Precision Air Pressure Regulator is available in 1/4" porting. Output ranges include 0-2 psig (0-0.15 bar), 0-10 psig (0-0.7 bar), 0-30 psig (0-2 bar), 0-60 psig (0-4 bar), and 0-100 psig (0-7 bar). Exhaust capacity is 0.1 scfm (2.8 Nl/min) downstream pressure 5 psig (0.3 bar) above set point. Sensitivity is 1 inch (25.4 mm). Air consumption is less than 6 scfh (170 Nl/min). A wide temperature range of 0º to 160ºF (-18º to 71ºC).

About ControlAir

ControlAir LLC manufactures precision pneumatic and electro-pneumatic controls. ControlAir's markets include process control, semiconductor, printing and converting presses, diagnostic medical equipment, robotics, quality control, automotive, analyzers, compressors, pumps, and paint equipment. For more information, visit www.controlair.com.

Dri-Air Introduces the MD (MicroDryer) Series

Dri-Air Industries, Inc is pleased to introduce a new product series in their extensive dryer line for the plastics industry. Known throughout the industry for their desiccant dryers, Dri-Air is now manufacturing a micro line of compressed air dryers with matching hoppers.

The MicroDryer Series (MD) is a line of sleek, compressed air dryers designed for very low throughputs. The series of dryers start with the MD-1 equipped with drying hoppers with a capacity of 1-3 lbs and range up to the MD-3 with the largest capacity of 15 lbs. Low dewpoints, -40˚F and below, are assured as the dryer is equipped with a membrane and compressed air prefilter.

The MD-1 is the first of the new Dri-Air dryers to be unveiled at NPE 2024. Built as a matched dryer/hopper combination, the fully stainless-steel construction and glass hopper is ideal for medical molding with low throughputs and/or high-cost resins. An optional adjustable fill sensor can be used with the standard full length sight glass to vary the capacity of the hopper from 1 lb to 3 lbs.

The dryer is available to operate on 120 volt or 230 volt single phase power and a 100 psi clean compressed air supply. For ease of use, the 4" color touch screen will easily guide the operator for temperature and alarm settings and a 7-day timer for automatic start / stops.

The MD-1 is also available with options to make the system even more flexible and user friendly, including -40˚F dewpoint meter, adjustable fill sensor, integrated compressed air loader for loading drying hopper, feed throat adapter and remote dryer capabilities.

About Dri-Air

Since 1974 Dri-Air has been the industry leader in proven desiccant dryer technology, offering the highest quality at competitive pricing. Our plastics drying and loading systems offer a full range of solutions for drying plastic resins, mixing, blending and conveying virgin, regrind and plastic colorants. We offer advanced microprocessor control, stainless steel insulated hoppers, closed-loop loading systems and full-flo electric dryer valves. Our constant attention to detail and incredible response time has helped us sell over 50,000 drying systems worldwide. From 1 pound to 3,000 pounds per hour, we offer solutions to a wide range of industries from simple solutions to complex custom applications. For more information, visit https://dri-air.com.

New MD Series Dryer is ideal for medical molding with low throughputs and/or high-cost resins.

FLIR Announces Si2-Series of Acoustic Imagers

FLIR, a Teledyne Technologies company, has announced the expansion of its versatile Si-Series of acoustic imaging cameras with three models in the new Si2 family, designed for detecting compressed air leaks, specialty gas leaks, mechanical faults, and partial discharges: the Si2-Pro, Si2-LD, and Si2-PD.

The Si2-Series offers industrial-grade solutions for the detection of air and gas leaks as well as mechanical faults such as bearing issues, addressing the top inspection requirements for industries such as manufacturing, electrical and utilities.

FLIR's new Si2-Series cameras provide superior performance, with the ability to identify issues over longer distances, detect and measure with increased sensitivity, and produce more accurate classification of issues.

Improvements in acoustic camera picture quality include 12 MP color camera, 8x digital zoom, and LED illumination for addressing dark areas. The Si2 also has increased battery life to keep professionals in the field longer without the need for swapping power sources. The specialty gas leak quantification and cost estimates have been expanded beyond compressed air to include other common industrial gases such as hydrogen, CO_2, methane, helium, argon, ammonia and more.

The Si2 cameras apply an array of acoustic imaging advancements that work to detect and quantify air and gas leaks, mechanical faults and partial discharge, making them the top-performing acoustic imaging cameras on the market for these types of detections.

FLIR's advanced automatic filtering identifies leaks by their sound signatures even in the noisiest of industrial environments. The new "mech mode" feature of the Si2-Series enhances site safety by enabling quick detection of mechanical issues, such as bearing faults, empowering professionals to rapidly evaluate conditions, identify problems and implement solutions.

Plant professionals can swiftly identify mechanical, leak and partial discharge issues,

New Si2-Pro, Si2-LD and Si2-PD models provide decision support, fleet management and enterprise data integration with new on-screen gas leak quantification, partial discharge assessment and mechanical fault measurement.

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then generate reports for urgent attention. On-camera decision support tools include mechanical defect measurement, classification and severity assessment of partial discharges, leak size estimation and cost analysis. The Si2-Pro, the most comprehensive solution that combines the features of the Si2-PD and Si2-LD, actively lowers costs by addressing mechanical bearing issues and partial discharge on electrical equipment, and it also significantly cuts leaks in facilities to reduce expenses from compressed air and gas leaks.

"Increasing safety while avoiding costly failures is the aim of the new Si-Series. With the addition of three leading-edge models that scale up for professional use in a wide variety of situations, the new Si2-Series of cameras cement their position as the industry's most complete, enterprise-ready solution," said Rob Milner, Business Development Director, FLIR. "The highly capable FLIR Thermal Studio will also be upgraded to include gas-leak quantification, making data simple to record and easier to share via reports between users, cutting down the time to perform and record multiple site inspections."

To complement the Si2-Series of acoustic imaging cameras, FLIR provides its acoustic training platform and 24/7 support through its global service organization.

About FLIR

FLIR, a Teledyne Technologies company, is a world leader in intelligent sensing solutions for industrial applications with thousands of employees worldwide. Founded in 1978, the company creates advanced technologies to help professionals make better, faster decisions that save lives and livelihoods. For more information, please visit www.teledyneflir.com.

ABB Launches Baldor-Reliance® SP4 motors

Motor operators in all industries are staying ahead of the curve in energy efficiency and environmental stewardship with ABB Baldor-Reliance® SP4™ motors. ABB's SP4 technology meets the NEMA Super Premium® efficiency level in a standard AC induction motor design operating across the line, independently of a variable speed drive.*

SP4 is ABB's solution for a more sustainable and efficient future driven by the need to reduce energy consumption. The idea is simple; take a proven AC induction motor design and make it better by reducing motor losses by an average of 20% while maintaining the simplicity, form, fit and function of today's installed base of AC induction motors. With more than 80% of industrial electric motors operating direct on line (DOL) – without using a drive to improve efficiency – SP4 represents ABB's commitment to improving efficiency and performance without requiring customers to make significant investments in additional technology or components. As a standalone DOL unit, SP4 achieves NEMA Super Premium efficiency; however, when paired with a variable speed drive, even higher efficiency levels are attainable.

SP4 motors are highly efficient, running cooler, reducing heat-based energy losses and extending bearing and other component life. Reducing energy losses also leads to lower electrical energy consumption, which lowers operating costs and total cost of ownership.

"Reducing electricity consumption benefits communities, businesses and the environment," said Jesse Henson, ABB NEMA Motors Division President. "As a leader in the industry, ABB has the responsibility to drive a sustainable shift in electrical motion that will enable the world

SP4 represents ABB's commitment to improving efficiency and performance without requiring customers to make significant investments in additional technology or components.

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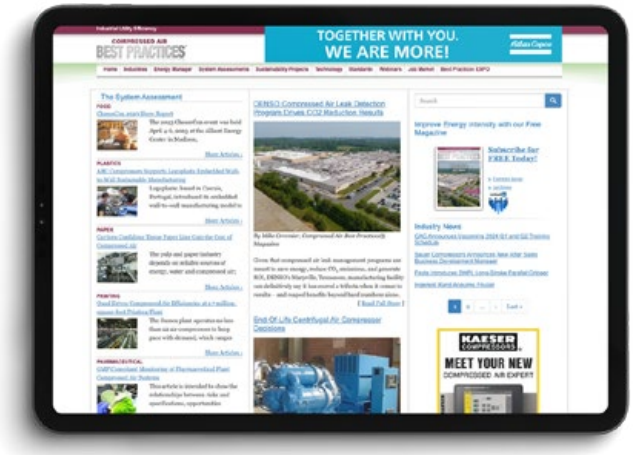

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The Magazine for Sustainable, Safe and Reliable Compressed Air Systems

Compressed Air Best Practices® is part of a family of magazines dedicated to **Sustainable, Safe and Reliable On-Site Utilities Powering Automation.** The U.S. Department of Energy estimates compressed air represents 30% of industrial energy use. Each issue features expert articles on how to conduct **Best Practice System Assessments** to reduce energy consumption while enhancing **Sustainability, Safety and Reliability.**

"We design around a specific number of plastic product production machines….we have the correct compressed air flows with clean air and stable pressure."

— Leandro Sponchiado, Technical Director USA, Logoplaste (April 2023 Issue)

"The cast for our airends is so durable that we can now use some of our learning to make older airends more efficient as remanufactured airends."

— John Randall, President & CEO, Hitachi Global Air Power (July 2023 Issue)

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Compressed Air Technology News

to meet growing energy demands while cutting emissions and preserving resources. SP4 motors exceed current U.S. efficiency requirements to offer customers maximum energy savings."

SP4 motors meet current U.S. Department of Energy efficiency standards as well as anticipated Medium Electric Motor (MEM) regulations, which take effect on June 1, 2027, in the United States. These regulations mandate that motors up to 100 hp must maintain NEMA Premium efficiency, while motors between 100 hp and 250 hp must achieve NEMA Super Premium efficiency.

45% of the world's electricity is converted by electric motors into motion, and there are more than 300 million industrial electric-driven systems in operations worldwide. As the cost of electricity continues to grow – along with the demand for electricity driven by population growth and new technologies – ABB will remain at the forefront of energy efficiency and sustainability by embedding circularity in products and solutions, offering lifetime services and investing in new business models to reduce waste, increase recycling and foster reusability.

The SP4 motors rollout is underway. In addition to the currently stocked models, new designs, ratings and features will be added soon.

About ABB

ABB is a technology leader in electrification and automation, enabling a more sustainable and resource-efficient future. The company's solutions connect engineering know-how and software to optimize how things are manufactured, moved, powered and operated. Building on more than 140 years of excellence, ABB's more than 105,000 employees are committed to driving innovations that accelerate industrial transformation. For more information, visit www.abb.com.

*NEMA Super Premium efficiency is generally comparable to IE4 efficiency for AC induction motors operated direct on line (DOL) as defined by the International Electrotechnical Commission (IEC).

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