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December 2015

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FROM THE EDITOR

Compressed Air Purification



How does your plant approach compressed air purity specifications and quality control? Each factory and process has unique purity requirements. Ruby Ochoa, from Trace Analytics, provides us with an excellent explanation of how to use the ISO 8573-1 purity classes and further how to monitor:

“The goal of any compressed air quality monitoring program should be to assure that air used in the manufacturing process is in a state of constant control and will not add contamination to the product.”

Michael Guelke, from Festo, provides us with an article on the different types of compressed air filters and dryers available and what purity levels they can achieve. “There are different types of air treatment components for removing contaminants, such as solid particles, liquid water, water vapor and oil vapors, odorants, and even bacteria and viruses.”

Parker Hannifin has consolidated several compressed air purification businesses under one umbrella – the Gas Separation and Filtration (GSF) division. Our Associate Editor, Clinton Shaffer, had the opportunity to speak with their executives to learn more. “We’re pretty excited. We believe that putting these two divisions together gives us the whole portfolio,” said Scott Feenan, General Manager, Parker Hannifin – GSF Division. “From a customer’s perspective, we have the compressor room all the way down to the point of use covered — between dryer technologies, filtration technologies, and gas generation.”

If you didn’t have the chance to travel to the 2015 editions of the World Energy Engineering Congress and/or the Association of Independent Compressor Distributors (AICD) Conference & Expo, we hope you enjoy our Show Reports.

Chris Beals has been conducting compressed air system reviews for almost two decades. He has provided us with a two-part article composed of “compressed air dryer installation observations from his auditor’s notebook.” Part 1 looks at system design philosophy, piping characteristics for oil-free systems, temperature impacts, desiccant dryer failure issues and compressed air dryer sizing.

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

ROD SMITH

Editor

tel: 412-980-9901

rod@airbestpractices.com

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INDUSTRY NEWS

C.H. Reed Retrofits Compressed Air System for Energy Savings of \$100,000

Optimizing energy usage for maximum efficiency is an essential objective for manufacturing plants in every industrial sector. The generation and distribution of compressed air is a large expense incurred in practically all manufacturing processes. Not only is the generation and treatment equipment of compressed air expensive, but frequent maintenance is also required. As a plant's compressed air system is often an integral part of the production process, it needs to be reliable, efficient, and easy to maintain.

Earlier this year, C.H. Reed partnered with a local container manufacturer that needed to replace a number of very old and unreliable reciprocating compressors, along with older, inefficient rotary screw compressors. This plant also needed to greatly reduce maintenance and energy costs associated with their compressed air system, all while keeping up with production demands during the improvement progression.

After analyzing the plant's demand profile, a variable displacement machine was determined to be as energy efficient as a variable speed drive unit. It would also help realize lower life-cycle costs. To meet the customer's goals, C.H. Reed proposed the installation of two Quincy QSI Rotary Screw Air Compressors with Power\$ync® variable displacement control.

A 3000 cfm water-cooled Hankison Refrigerated Compressed Air Dryer was also recommended. To simplify the installation process, Transair Aluminum Piping was used to replace the steel and copper air lines within the compressor room. Transair is fast, flexible, reusable, and easy to modify, leading to a prompt installation. Two Quincy Condensate / Oil Separators were installed to reduce the amount of contaminants in the wastewater stream, allowing for a safe, environmentally friendly and inexpensive disposal.



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INDUSTRY NEWS



The 200- and 300-hp Quincy QSI Compressors helped the customer save over \$100,000 a year in energy costs.

The QSI 200- and 300-hp units feature Quincy's Power\$ync® variable capacity control technology, and give the compressors the ability to function at less than full capacity while maintaining excellent energy efficiency. The Power\$ync® control allows the two units to communicate with each other in real time, while one operates as a base-load compressor

and the other as a trim compressor at the same target pressure for maximum efficiency without the need for a central controller. This arrangement allows the compressor system to match the plant air requirements with minimum power, achieving annual energy savings in excess of \$100,000 compared to the previous system.

For more information, visit www.cbreed.com.

Atlas Copco Receives Class 1 Certification for UD+ QDT Filter Combination

Atlas Copco Airpower is one of the first players in the compressed air filtration industry to receive ISO 8573-1:2010 class 1 certification for its UD+ QDT filter train. "Atlas Copco's

two-in-one coalescing UD+ filter combined with the newly redesigned activated carbon tower QDT allows for an oil content far below 0.01 mg/m³, the maximum allowed total oil content for class 1," said Isabelle De Wolf, head of the filtration R&D team of Atlas Copco Airpower.

This was proven through independent tests conducted by the TÜV Institute, a global provider of technical, safety, and certification services. "Atlas Copco's UD+ filter takes wrapped filter technology to a new level, combining the reliability and performance of wrapped filters with pressure drops lower than even pleated filters can achieve," De Wolf said. "The result is an astonishing 40 percent energy efficiency improvement compared to traditional filters."

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With great success comes great responsibility, not just to our distributors but, to our community. The nano 2015 Giving Campaign was such a success, we are excited to announce our Giving Campaign for 2016. nano will again be giving back a percentage of profits for 3 months to 3 charities.

- June: Pet Adoption Month
- October: Breast Cancer Research
- November: 'Movember' Mens' Health Awareness

We look forward to continued success and to working with our great friends and partners in our industry.

Happy Holidays and all the best in 2016.

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The redesigned QDT activated carbon tower removes the residual oil vapors and odors from the compressed air supply. With optimization of the activated carbon material and internal flow path, the tower improves energy efficiency by an average of 65 percent while continuing to provide air purity, a small footprint, and a long lifetime.

“With these achievements and the class 1 certification, Atlas Copco strengthens its commitment to deliver pure, clean air to the industry at the lowest possible energy cost,” said Horst Wasel, President for the Medical Gas Solutions Division.

Medical Gas Solutions is a division within Atlas Copco’s Compressor Technique business area. It develops, manufactures and markets medical gas equipment, including medical air

and vacuum plants, manifolds and pipeline components, as well as filtration solutions worldwide. Products are offered under several brands. Production facilities are situated in China, India, Belgium, United Kingdom, Italy and USA. The divisional headquarters is located in Rock Hill, SC.

For more information, visit www.atlascopco.com.

Aerzen USA Welcomes New President

Aerzen USA has made a change in company’s administrative structure, appointing a new president to continue the positive trends in growth and development.

Pierre Noack has been President of Aerzen USA for over 30 years, and, during those years, the



Pierre Noack (left) and Tony Morris (right)

company has achieved growth and success. At this time his services are required to support the development of Aerzen’s Worldwide Process Gas Division. He will be moving to Germany, near Aerzen, and will be working at the Aerzen headquarters. Additionally, he will remain on the Board of Directors of Aerzen USA.



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INDUSTRY NEWS

Pierre Noack has been President of Aerzen USA for over 30 years, and, during those years, the company has achieved growth and success.

To continue the positive trend in the USA, the company has hired a new president, Tony Morris. Mr. Morris has an extensive background in the industrial markets, including international business development in the United States, Asia and Europe. His educational background includes an Engineering degree and an MBA, along with professional leadership skills and abilities. Additionally he is focused on continual improvement, sustainability and customer closeness.

He officially started at Aerzen USA in September 2015, and is learning about Aerzen's products,

procedures and daily business. He is now part of the existing management team supported by a regional manager.

For more information, visit www.aerzenusa.com.

Endress+Hauser and Rockwell Automation Invest in BridgeValley Process Training Unit

BridgeValley Community and Technical College in West Virginia recently celebrated the opening of a cutting-edge PTU® (Process Training Unit) made possible by the generous

contributions of Endress+Hauser, BridgeValley and Rockwell Automation. Thanks to industry partners, BridgeValley will be the new home to a \$1 million, 1,800 square-foot, state-of-the-art PTU®.

“By working alongside BridgeValley and other universities, Endress+Hauser can help secure the talent pipeline and better prepare our next-generation workforce for successful careers in the field of process control and automation,” said Brandyn Ferguson, Vice President of Human Resources, Endress+Hauser. “The innovative approach we have taken at BridgeValley is truly unique to the industry.”

The BridgeValley PTU® will serve as a go-to place for companies who are seeking workforce training for their employees and customers, and for students to utilize as they pursue their degree programs. The PTU® combines theory and a hands-on approach to provide participants with real-world experience in a safe, working process environment.

The PTU® is outfitted to help students and customers gain hands-on experience with the types of operation, diagnostics and troubleshooting found in real-life process plants. It features the latest Endress+Hauser flow, level, temperature, pressure and analytical instrumentation, and two 350-gallon tanks, in addition to the PlantPax process control system donated by Rockwell Automation. The PlantPax process automation system will be used in a functioning environment with field devices to train customers for operation and maintenance of process systems. In addition, it provides a venue for demonstrations of Endress+Hauser and Rockwell Automation technology and a regional resource for customers to obtain hands-on training in a controlled environment.

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“A key aspect of our role in the community is to partner with industry leaders to provide technical education necessary to keep our companies competitive and jobs in West Virginia,” said Dr. Jo Harris, BridgeValley President. “Our collaboration with Endress+Hauser and Rockwell Automation allows students and local companies to receive real-world experience in a controlled learning environment.”



The new Process Training Unit at BridgeValley Community and Technical College

The partnership between BridgeValley, manufacturers Endress+Hauser and Rockwell Automation, and the sales and service company Forberg Scientific Inc. will benefit the community and industry in West Virginia by not only offering learning opportunities for college students, but also industrial training

for workers from many large companies in the area wanting to modernize their processing plants.

The BridgeValley PTU[®] is one of ten across the U.S. built to help keep up with the heightened demand for workforce training.

Recognizing this trend, Endress+Hauser has made investments to become the clear leader and number one instrumentation training provider in the industry.

For more information, visit www.bridgevalley.edu/ptu-training-application.

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Using ISO 8573-1 to Test Compressed Air: CLEARING THE CONFUSION

By Ruby Ochoa, President, Trace Analytics, LLC

► Compressed air is used in more than 70 percent of all manufacturing activities, ranging from highly critical applications that may impact product quality to general “shop” uses. When compressed air is used in the production of pharmaceuticals, food, beverages, medical devices, and other products, there seems to be confusion on what testing needs to be performed.



In many applications, compressed air is used from start to finish, as shown here as jars exit a bottle capper.

By defining compressed air contaminants, reviewing ISO 8573-1, and discussing how to designate a quality class per ISO 8573-1, this article will help clear up some of that confusion. It will also provide best practices for setting up a compressed air monitoring program.

What are the Contaminants in Compressed Air?

The Compressed Air & Gas Institute (CAGI) cites 10 contaminants that typically need to be removed or reduced from low-pressure compressed air used for manufacturing (not breathing air). These contaminants fall into four general categories:

1. Particles (from pipe scale, wear particles and atmospheric dirt)
2. Water (liquid, vapor and aerosol)
3. Oil (liquid, vapor and aerosol)
4. Microorganisms

The international standard ISO 8573-1:2010 is a compressed air quality specification that addresses these very same specific contaminants by providing a range of purity

classes for particles, water and oil. It does not include classes for gases or microorganisms.

Employing a Standard for Compressed Air Testing

Selecting ISO 8573-1 as the basis for compressed air quality monitoring and testing is the obvious choice, since it provides a common language that all involved parties can use.

ISO 8573 consists of nine parts or sections that address compressed air quality. ISO 8573-1 is probably the most frequently cited document of the series. It includes the purity classes and a designation principle. Parts 2 through 9



Jar washers using contaminated compressed air may adulterate the final product.

provide valuable information to the interested party or analytical laboratory, and include analytical techniques and sampling methods.

The purity classes are aligned with what is commercially available to remove these major contaminants. Performing a simple search on the Internet for “air compressor filters ISO 8573-1:2010” provides pages and pages of compressor and filter manufacturer advertisements citing ISO 8573-1:2010 purity classes to describe the quality of air that they can produce with their products. Many of them even have suggestions as to which purity classes should be used for various industries.

The summary chart (Figure 1) shows purity classes 0 through X for particles, water, and oil. The end user can then select a purity class for each contaminant based on either equipment installed or air quality required for a specific process or product. There should be no confusion on what contaminants and limits need to be tested, because that decision was made when compressor system filtration and point-of-use filters were selected.

Important Aspects of ISO 8573

ISO 8573-1 does not include purity classes for gases. ISO 8573 provides testing methods in Part 6 and specifically refers to carbon dioxide, carbon monoxide, hydrocarbons with 5 or less carbons in the chain (C_{1 to 5}), sulfur dioxide, nitric oxide, and nitrogen dioxide. If your product could be adversely affected by a particular gaseous contaminant, then it should also be addressed in your filtering, engineering controls, and monitoring specifications.

Nor does ISO 8573-1 include purity classes for microbiological contaminants. Testing methods are provided in Part 7. Since there are no guidelines for microbial limits in compressed air, many manufacturers use limits established for their environmental monitoring program.

ISO 8573-1:2010 Compressed Air Contaminants and Purity Classes								
Class	Particles				Water		Oil	
	By Particle Size (maximum number of particles per m ³) See Note 2			By Mass mg/m ³	Vapor Pressure Dewpoint		Liquid g/m ³	Liquid, Aerosol, & Vapor See Note 1 mg/m ³
	0.10 – 0.5 microns	0.5 – 1.0 microns	1.0 – 5.0 microns		°C	°F		
0	As specified by the equipment user or supplier and more stringent than class 1							
1	≤ 20,000	≤ 400	≤ 10	-	≤ -70	≤ -94	-	≤ 0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40	≤ -40	-	≤ 0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -20	≤ -4	-	≤ 1
4	-	-	≤ 10,000	-	≤ +3	≤ +37	-	≤ 5
5	-	-	≤ 100,000	-	≤ +7	≤ +45	-	-
6	-	-	-	0 – ≤ 5	≤ +10	≤ +50	-	-
7	-	-	-	5 – ≤ 10	-	-	≤ 0.5	-
8	-	-	-	-	-	-	≤ 5	-
9	-	-	-	-	-	-	≤ 10	-
X	-	-	-	> 10	-	-	> 10	> 5
Microbiological Contaminants					Other Gaseous Contaminants			
No purity classes are identified					No purity classes are identified Gases mentioned are: CO, CO ₂ , SO ₂ , NOX, Hydrocarbons in the range of C ₁ to C ₆			

Figure 1: The summary chart provides purity classes 0 through X for particles, water, and oil.

Total oil purity is of particular interest, because it includes aerosol, vapor and liquid forms. For purity classes 0, 1 and 2, measurement must include oil aerosol and vapor (as well as any organic solvents in the vapor.) Oil vapors are

defined as a mixture of hydrocarbons with 6 or more carbon atoms (C₆₊).

For classes 3, 4 and X, vapors are considered optional, as there would be no significant

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USING ISO 8573-1 TO TEST COMPRESSED AIR: CLEARING THE CONFUSION

impact at measurement levels greater than or equal to 1.0 mg/m^3 . Sampling and analytical methods are covered in Parts 2 (Method B for aerosol) and 5 (vapor).

Liquid oil is typically only measured when wall flow is present and/or heavy contamination is expected. Sampling and analytical techniques are described in ISO 8573-2, Method A.

What is not evident in the chart for particles is that there is an additional stipulation that there can be no particles greater than 5 microns present for Classes 1 through 5. Why is this relevant or important to know? Some manufacturing processes include flexible tubing or hoses after the point-of-use filters. Common rubber, nylon, and other flexible tubing can shed numerous particles that can affect product quality. This is a good example why samples should be taken at the point of use. While the compressed air quality might be perfect, adding a hose to the operation can adulterate the quality of the air being used on the final product. It is important to specify

tubing or hose with low particle shedding and low water permeation properties.

Other common causes for particle count failures can be attributed to fittings, gauges, or other items using o-rings or rubber gaskets. The o-rings will deteriorate due to friction and/or age.

Everyone involved — from the end user, service distributor, and compressor manufacturer, to the filter manufacturer and the testing laboratory — must use a common language when discussing clean, dry air. ISO 8573-1 Purity Classes make that easy to accomplish, and the standard is proving to be the preferred language.

How to Designate ISO 8573-1 Purity Classes

The designation of ISO 8573-1 Purity Classes for compressed air includes the specification name and edition date, followed by the purity class number(s) in brackets. The designation is presented in the following order



Air quality can have a direct effect on the final product.

and separated by a colon: ISO 8573-1:2010
[Particles:Water:Oil]*

Where:

P is the Purity Class for Particles
(Classes 0 to 7, X)

W is the Purity Class for Water
(Classes 0 to 9, X)

O is the Purity Class for Oil
(Classes 0 to 4, X)

*ISO 8573-1 actually uses the letters ABC, but for this purpose, PWO makes is easier to remember the correct order.

Specification Example #1: ISO 8573-1:2010
[2:2:1]

This indicates Class 2 for particles, Class 2 for water, and Class 1 for oil.

Specification Example #2: ISO 8573-1:2010
[2:-:1]

When a class for any particular contaminant (either P, W, or O) is not specified, the designation shall be replaced by a hyphen (as seen in Example 2). This indicates that water is not classified.

Specification Example #3: ISO 8573-1:2010
[1:2:0 (0.001)]

The use of the term **Class 0** is frequently misunderstood and misused. When specifying air quality that meets Class 0, the limit **MUST** be included in the designation, **AND** it must be more stringent than Class 1 (Refer to Example 3). Class 0 does not mean that there are zero contaminants.

This indicates Class 1 for particles, Class 2 for water, and Class 0 for oil with a limit of 0.001 mg/m³. When requesting filtration or analysis

to Class 0, always provide a limit that is more stringent than Class 1.

Is There Any Guidance on Selecting Purity Classes?

Clean, dry air is typically needed by food, beverage, pharmaceutical, and other industries manufacturing a consumable product. There are no mandated air quality specifications, only general statements, such as:

- FDA Code of Regulations Title 21, Part 110.40, Subpart C, Item (g) states: “Compressed air or other gases mechanically introduced into food or used to clean food-contact surfaces or equipment shall be treated in such a way that food is not contaminated with unlawful indirect food additives. (21CFR110.40)”



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- [ICH Q8 (R2) II 4.0] states: “Compressed air is a Critical Process Parameter (CPP) whose variability has an impact on the Critical Quality Attribute (CQA) and therefore should be monitored or controlled to ensure the process produces the desired quality.” (Source: Pharmaceutical Development – Q8(R2), International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH), www.ich.org)
- Safe Quality Food (SQF) Institute dictates: “Compressed air used in the manufacturing process shall be regularly monitored for purity.”
- As a voluntary code of practice, BCAS Food and Beverage Grade Compressed Air Best Practice Guideline 102 stipulates compressed air that is in direct contact with the product should meet or exceed ISO 8573-1:2010 [2:2:1] and [2:4:2] for indirect contact. It also states that compressed air purity shall be tested and verified at least twice per year and whenever maintenance work or an activity occurs that may affect the air quality (www.bcas.org.uk).

What Constitutes a Monitoring Program?

The goal of any compressed air quality monitoring program should be to assure that air used in the manufacturing process is in a state of constant control and will not add contamination to the product. Steps to establish a monitoring program include:

1. Document the current compressed air system in place. Include the type of compressor (oil-free, oil lubricated); type of system filtration for particle, water and oil removal; storage tank capacity; type of point-of-use filters; and material used for distribution piping (stainless steel, copper, aluminum, galvanized, etc.). Include make, model, serial, and part numbers. *This information will provide insight as to the quality of air expected.*
2. Create a diagram of the compressor system, piping and outlets. Indicate type of usage for each outlet, including direct or indirect product contact, and non-product contact. If point-of-use filters are installed, indicate their location and the type of filter. *This*

will identify which product lines must be tested and aid in preparation and selection of a representative number of sampling outlets.

3. Document air compressor maintenance. This should include filter changes, compressor maintenance, changes or additions to the distribution piping, emergency repairs, etc. *This could be useful troubleshooting information in the event of a failure. It can also be a guide in determining sampling intervals.*
4. Perform air quality testing for particles, water, oil, and microorganisms over a period of time to gather sufficient data points for a trend analysis. Ensure that a variety of points of use are sampled at various times throughout the year and are representative of air used during a production cycle.

This variety in sampling is intended to catch irregularities that may occur due to weather conditions or other unknown procedures. It is also recommended to include sampling immediately before point-of-use filter changes to determine if air quality was acceptable at the end of the filter life.
5. Review trend analysis results. *This will provide valuable information to either confirm or establish purity classes appropriate for product safety.*

A monitoring program for compressed air is not about checking an item off an audit checklist. A monitoring program should be designed to either a) confirm that air quality is meeting levels specified in corporate quality control documents, or b) identify over time the appropriate compressed air quality for the product being manufactured so that purity classes can be selected and documented.

Since there are no federally mandated air quality specifications, each manufacturer has to determine the appropriate compressed air quality necessary to prevent product contamination. Adopting the use of ISO 8573-1:2010 purity classes makes this decision much less confusing.

ISO 8573-1:2010 is an internationally accepted language that can be used between the compressor manufacturer, filter manufacturer,



“While the compressed air quality might be perfect, adding a hose to the operation can adulterate the quality of the air being used on the final product. It is important to specify tubing or hose with low particle shedding and low water permeation properties.”

— Ruby Ochoa, President, Trace Analytics, LLC



Trace Analytics AirCheck Kit K8573NB is used for sampling particles, water, and oil.

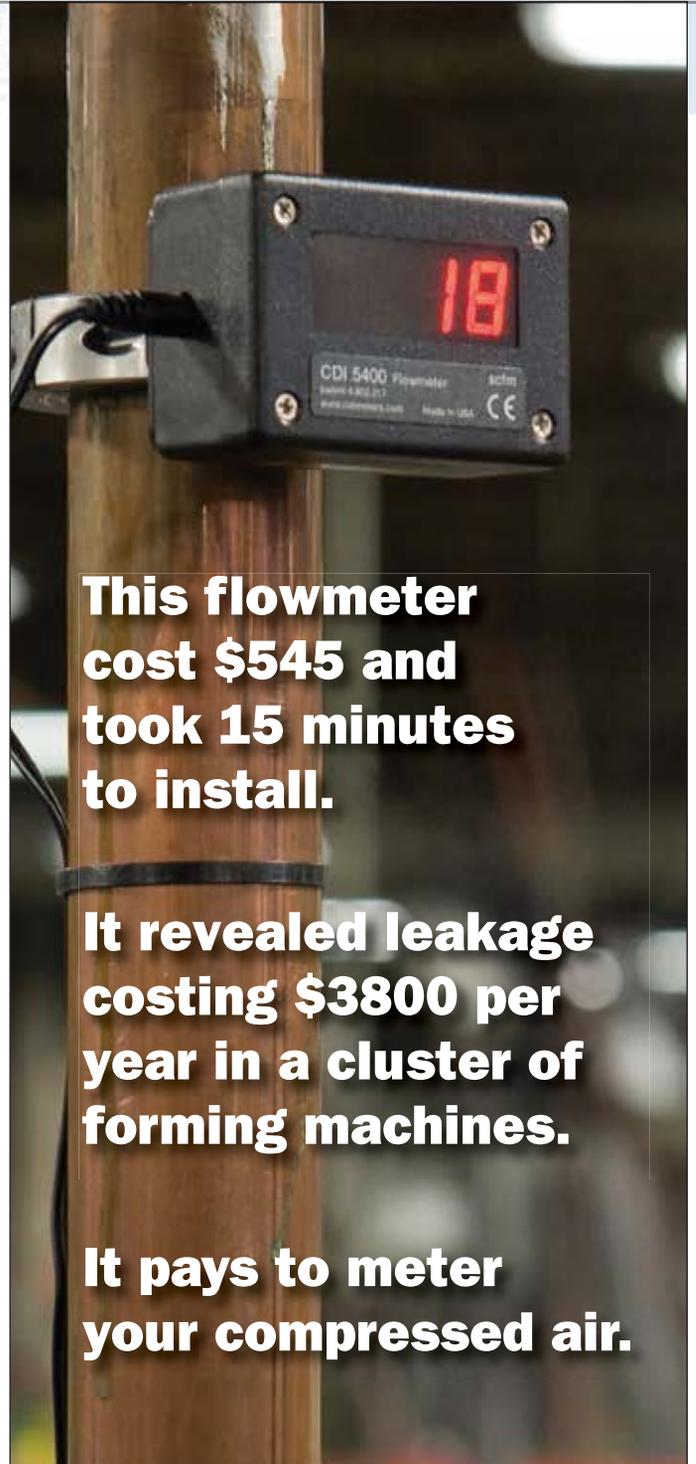
product manufacturer, and analytical laboratory to confirm the safety of compressed air used in the manufacturing process.

How to Sample Compressed Air Quality

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Parker Hannifin Creates

NEW GAS SEPARATION AND FILTRATION DIVISION



6000 scfm blower purge desiccant dryer specifically designed for an oil refinery

By Clinton Shaffer, Associate Editor, Compressed Air Best Practices® Magazine

► Critical applications — such as semiconductor manufacturing, food processing and automobile spray finishing — require high quality, clean compressed air. Otherwise, those manufacturing facilities are doomed to costly rework, product recalls and a tarnished reputation.

“In semiconductor manufacturing, a small particle can ruin one of the die on a multi-die semiconductor wafer,” explained Dan Ryan, Engineering Manager, Parker Hannifin Corporation – Gas Separation and Filtration Division. “Even when it comes to things like painting automobiles, a few small, invisible particulates, depending on the makeup of them, can actually cause a visible flaw in the paint job.”

If you are in food processing, the stakes are even higher. Many of those plants need filtration beyond the compressor room. Often,

air treatment and precise quality monitoring is required right at the point of use.

Given those market demands, Parker Hannifin recently consolidated several businesses under one umbrella — the Gas Separation and Filtration (GSF) division. The new business unit comprises Parker’s Finite Airtek Filtration (FAF) division, and the Filtration and Separation (FNS) division. With a portfolio of five brands (Airtek, Balston, domnick hunter, Finite, and Zander), along with custom-engineering capabilities, the GSF Division can address a comprehensive range of compressed air treatment and gas generation applications.

“We’re pretty excited. We believe that putting these two divisions together gives us the whole portfolio,” said Scott Feenan, General Manager, Parker Hannifin – GSF Division. “From a customer’s perspective, we have the compressor room all the way down to

the point of use covered — between dryer technologies, filtration technologies, and gas generation. There are not too many companies today that can offer that array of technologies as a one-stop shop for customers.”

To learn more about how Parker’s new GSF Division will impact industry, the team at Compressed Air Best Practices® Magazine spoke with three key GSF members: Dan Ryan, Engineering Manager; Scott Feenan, General Manager; and John Lucidi, Sales & Marketing Manager. During our discussions, we talked about how the logistics behind the consolidation will benefit Parker’s product portfolio, its distribution channels, and its end users.

Filter Manufacturing

With the reorganization, Parker FAF Division’s Finite filter manufacturing, based in Oxford, MI, and its FNS Division’s Balston filter

manufacturing, based in Haverhill, MA, will be combined. The manufacturing processes from Oxford are physically moving to Haverhill, where the division will continue to manufacture both the Finite and the Balston brands of coalescing filters.

“There are some slight differences to the manufacturing methods between the way filters are made in Michigan and in Massachusetts,” Ryan explained. “After a little bit of an analysis, we determined that both manufacturing methods still have plenty of merit and have certain advantages. So we’ll still continue to make both Finite and Balston brands, and there will be a differentiation between the two.”

Understanding Different Coalescing Filters

High-efficiency coalescing filters are designed to remove oil aerosols and fine moisture droplets. They are also highly effective at removing particulates. Parker uses three different manufacturing techniques to make these filters.

“The basic design used today is sub-micronic glass. They incorporate glass fibers that have been manufactured so the average diameter of the individual fibers is at or below 1 micron,” Ryan told us. “Over the years, different materials have been added to the glass, for instance polymeric nanofibers, which are very small diameter plastic fibers added to the glass mix to improve efficiency. If you see an oil-removing coalescing filter, the construction is almost always micro-glass, but there are various ways to do it.”

One manufacturing method involves rolling filter paper. For this type of product, made early on by domnick hunter, filter paper is rolled four or five times, creating layers around a core. It is efficient because air is forced through a fairly thick section of micro-glass.



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PARKER HANNIFIN CREATES NEW GAS SEPARATION AND FILTRATION DIVISION

Another technique, commonly used by both the Finite and Balston brands, uses a vacuum formation process to manufacture a very similar finished product. During vacuum formation, micro-glass fibers are combined with chemicals called binders in a slurry of water. The vacuum then creates a cylindrical filter material that looks similar to rolled filter paper, but is actually only one layer of micro-glass — as opposed to the multi-layered rolled filter.

The third type of filter, which is now used for special applications by all Parker brands, is the pleated micro-glass filter. The pleating process typically takes one or more layers of filter paper, and puts them together in a pleating operation.

“Those are the three methods we employ, and all the brands still have variations of two of

those particular types,” Ryan explained. “One is always pleated, and the other is either the rolled glass or the formed micro-glass. The vacuum-formed and rolled can be made to have a little bit higher filtration efficiency, but you sacrifice differential pressure. Pleated has extremely low differential pressure with very good efficiency for almost all applications.”

At the GSF division, Parker will manufacture pleated micro-glass coalescing filters for high flow and high inlet air concentrations. The main product, however, is the vacuum-formed filter elements, because they are cost effective and very efficient.

Combined Testing Capabilities

Another significant aspect of the new division is its testing capabilities, which will

integrate testing labs from the Michigan and Massachusetts locations. The manufacturing plant in Oxford has been producing coalescing filters for close to 35 years, and its testing capabilities have grown over those years to include a fully equipped and fully staffed test laboratory. Used for both product testing and R&D, the testing facility ensures that Parker meets the quality claims about particulate removal and coalescing efficiency listed in its literature.

The Haverhill location has also developed a laboratory for testing to ISO 12500. During product development, engineers from both branches are able to use one another’s testing facilities for confirmation, providing a unique capability for substantiating engineering claims. Under the new consolidation, the Oxford lab will be moved to the Haverhill location.

“We’ll have the opportunity, unlike most of our competitors, to actually have two full sets of test equipment,” Ryan said. “It’s really important for us to make sure that what we say on the outside of the carton is exactly what the product does. There’s an ASME inspector who is in our facility in Lancaster three or four days a week. He’s got his own office in our building. That’s how serious we are about making sure we meet all the certifications that our customers demand.”

Filtration Testing: To What Standard and Why?

Frequently, facilities in the food processing and medical industries concern themselves with ISO 8573-1 purity classes, making sure their compressed air has safe and acceptable levels of particulates, water and oil. While air filters help end users reach certain quality classes, filter manufacturers are more concerned with ISO 12500, because it helps to test the efficacy, or efficiency, of the filter.




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“If you read 8573 carefully, the rating is a measurement of the quality of the compressed air. When we manufacture a filter, we think more in terms of efficiency percentage,” Ryan explained. “If you have a filter that is 99 percent efficient, and the incoming air is very clean to start with, then the air that’s exiting is extremely clean to finish. So if you measure just according to ISO 8573-1, you don’t take into account the inlet conditions at the filter.”

The ISO 12500 series of standards actually calls out the levels of inlet contamination concentration, and manufacturers report on the level of outlet contamination. In that way, it becomes very easy to compare two different competitive filters, or even filters of two different technologies.

“If you want to measure the actual efficiency of the filter, you use ISO 12500. To specify air quality, you use ISO 8573,” Ryan stated. “The two standards are used hand in hand, and customers or end users who really understand what they’re doing need to have a little bit of knowledge about both of those standards.”

Compressed Air Dryers and Gas Generators

A third logistical maneuver taking place involves moving the Parker FNS Division’s industrial nitrogen generator manufacturing operation located in Baltimore, MD, to its “show-piece” facility in Lancaster, NY. The Lancaster plant manufactures cycling and non-cycling refrigerated dryers, and an exhaustive array of desiccant air dryers — many of which are customized and handled through their Special Engineering Group. The addition of nitrogen generators to Lancaster’s manufacturing operations makes sense based on similarities in technologies.



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integrated into the GSF division's product portfolio. Lab gas generators will continue to be manufactured at the Haverhill plant. The team at Parker believes that the FNS side of the business can bring its in-depth application knowledge to all aspects of the new GSF Division.

"We sell a great deal of lab gas generators into the life science market for gas chromatography and mass spectroscopy, and we have a really good understanding of that market," Lucidi explained. "And that's something the FAF side of the business has been getting into more — with medical air dryers and chillers for medical applications. We think there is an opportunity to share expertise across markets to better serve the customer."

Broadening the Portfolio and Expanding Technical Expertise

There are many questions that arise when evaluating compressed air quality and gas generation: What levels of oil aerosols and other particulates are acceptable at the point of use? Where should I position filters, and how efficient should they be? Is it more cost effective for me to generate my own nitrogen? How do I achieve and monitor for sterile air?

Parker's new GSF Division seeks to answer those questions — and countless others — by disseminating product and application expertise throughout its selling force and distribution

"From a manufacturing standpoint, we've taken the Baltimore industrial gas generation business and folded it into the Lancaster operations," Feenan told us. "The large twin-tower systems that create nitrogen and oxygen gas are really similar technology to pressure swing adsorption (PSA) dryers. You have differences with overall system design, timing cycles and desiccant selection, however, if you saw a gas generator being built next to a PSA dryer, they'd look very similar."

Now Lancaster will make both pressure swing adsorption dryers and nitrogen gas generators for its key markets. Parker also believes bringing the gas generation technology

under the GSF umbrella will help broaden its distributors' portfolios.

"We have a lot of tools that we can bring to a distributor," Feenan said. "We do a lot of training with our selling system and distributors to make sure they are an application expert out in the field. Gas generation is relatively new, let's say in the last 10 years, but it is very complementary to a compressed air distributor's portfolio. They need this kind of assistance. It helps them be successful."

In addition to industrial nitrogen gas generators, the FNS Division's analytical laboratory gas generators will also be



"We have a lot of tools that we can bring to a distributor. We do a lot of training with our selling system and distributors to make sure they are an application expert out in the field."

— Scott Feenan, General Manager, Parker Hannifin – GSF Division



Containerized, high-pressure nitrogen generation system

network. The newly formed division will look to capture the specialized knowledge and skills from each division, and implement the best practices across the entire business unit.

“Superior sales skills and application advice — that’s what we are hoping to bring to the entire product line,” Lucidi told us. “We want to take the successful selling tools from the individual teams, and develop a sales organization that is knowledgeable and very well informed. One that supplies significant value and expertise to the customer.”

By following the strategic consolidation with an investment in the sales force, Parker’s new GSF Division is looking to better educate end users, and provide more value to them in the long run.

“Now we’ll be able to supply the customer with the best of both worlds for compressed air filtration, dehydration and gas generation systems,” Feenan explained. “Parker

Finite, Airtek, domnick hunter, Zander and Balston are some of the very best industrial compressed air and gas brands, and we intend to build on a reputation of engineering and application expertise to help support our distributor network.

“From an operational perspective, we’ll have Lancaster as a center of excellence for large-scale compressed air treatment and gas generation, and then we’ll have our Haverhill operation, which will be a center of excellence for vacuum-formed filter media, filter housings, and filter assemblies for point-of-use applications, or as pre- and post-filtration for large-scale dryers or gas generators. We believe that our newly merged capabilities will bring value to the marketplace.” **BP**

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Compressed Air FILTRATION 101

By Michael Guelker, Product Manager –
Actuators and Air Supply Products, Festo

► Proper air preparation significantly increases the process and production reliability of machines. Particles, water and oils in compressed air reduce the service life and functionality of components and

systems. They also impair productivity and energy efficiency. In this article, a variety of air filtration and air treatment products are outlined and discussed, along with ancillary equipment like drains. Additionally, the article

provides an overview of the compressed air purity classes defined by ISO 8573-1:2010.

Why Compressed Air Filtration is Necessary

One cubic foot of compressed air can contain millions of dirt particles, considerable amounts of water and oil — and even heavy metals like lead, cadmium and mercury. If they are not filtered out, trouble-free operation of the system components, like valves and cylinders, cannot be guaranteed in the long term. Poorly prepared compressed air can contaminate control valves, and cause seals to swell and wear prematurely. As a result, the right compressed air preparation is essential for reducing machine downtime, and for reducing maintenance and energy costs.

The Variables of Compressed Air Preparation

There are three variables to air preparation: compressed air purity, compressed air quantity (flow) and compressed air pressure. Depending on the system requirements, coordinating these three variables ensures high compressed air quality, and forms the basis for selecting the proper service unit components. The required compressed



Air preparation filters from FESTO help eliminate compressed air contaminants, like dirt, water and oil.

air purity increases both the running performance and the efficiency of pneumatic systems, and can ensure compliance with legal specifications in industries such as food processing. The flow quantity is largely determined by flow cross sections and the design dimensions of the machine. In general and provided the design is the same, larger components have higher flow rates. Optimized operating pressure increases the efficiency, minimizes wear and reduces power consumption. In order to coordinate the compressed air purity, compressed air quantity and pressure for the specifications of a system, the correct individual components must be selected. For example, this includes on/off valves, pressure build-up valves, pressure regulators, water separators, filters and drying units.

Types of Filters and Air Treatment Equipment

There are different types of air treatment components for removing contaminants, such as solid particles, liquid water, water vapor and oil vapors, odorants, and even bacteria and viruses. For most automation applications, the focus is to remove solid particles and water.

- **Water Separators** remove condensate, either with a centrifugal design or a coalescing principle.
 - A centrifugal separator (Figure 1) causes a rotary motion in the air, forcing particles to accelerate in a radial outward movement. Once they reach the outside, they drain into the bowl. These are effective for removing water droplets, as well as



Figure 1: Centrifugal water separators remove condensate from compressed air by accelerating particles in a radial motion.

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COMPRESSED AIR FILTRATION 101

dust and dirt particles larger than 5 microns in size. No maintenance is required for this process.

- A coalescing separator flows the air from the inside to the outside of the filter element. These filter cartridges must be replaced regularly.
- **Filters** are used to remove particles, condensate and oil.
 - Coarse / particulate filters (Figure 2) have a pore size of 5 to 40 microns. The air flows past a centrifugal separator and then through the filter element. The filter elements are often a sintered material, like polyethylene or bronze.
 - Fine and micro filters (Figure 3) remove particles smaller than 1 micron, down to 0.01 micron. The air flows through the filter cartridges from the inside to the outside. Solid particles get stuck in the filter cartridge, clogging it up. Fluid particles, such as condensate or oil, coalesce or attach to larger droplets, which flow off and are caught in the filter bowl. It is important to cascade your filters to avoid prematurely clogging the filter element. For example, if 1-micron filtration is needed, it is recommended to use a 5-micron filter upstream so that the 1-micron filter does not become clogged with larger particles.
- Activated carbon filters bond hydrocarbon residue, odorants and oil vapors.
- Sterile filters ensure that the air is free of germs.

➤ **Dryers** are used to remove water vapors beyond the capability of the fine and micro coalescing filters, and are classified according to the pressure dew point (PDP) that can be achieved. The pressure dew point defines the temperature to which compressed air can be cooled without making the water in it condense. If the temperature is below the pressure dew point, condensate will form. Even

if the temperature is subsequently increased, this condensate will remain and can lead to corrosion of components.

- Refrigeration dryers are commonly located downstream from the plant's air compressor. The air is cooled to just above freezing in a cooling unit, and the condensate that falls off is drained away. The pressure dew point achieved is around 37°F (3°C). To avoid condensation, it is recommended that the pressure dew point is set to 50°F (10°C) below the ambient temperature, so a refrigeration dryer is sufficient for systems whose

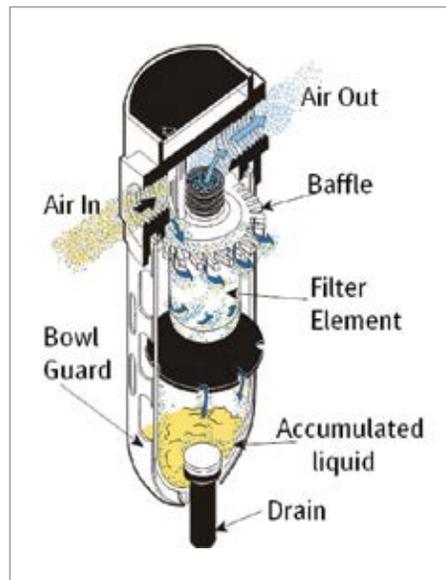


Figure 2: Coarse filters remove larger sized particles, condensate and oil, and protect finer filters downstream.

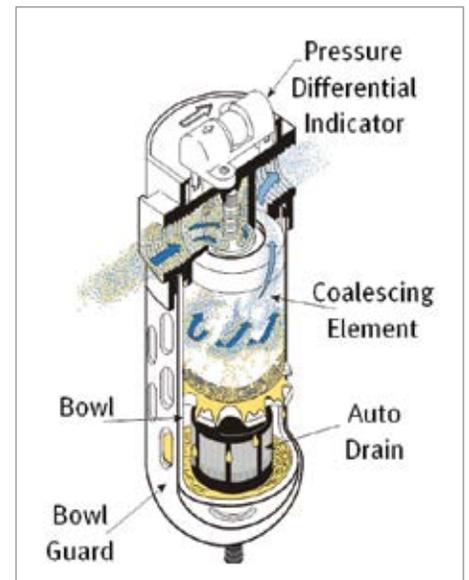


Figure 3: Coalescing filters remove sub-micronic particles, including condensate and oil, which flow off and collect in the filter bowl.



“It is important to cascade your filters to avoid prematurely clogging the filter element. For example, if 1-micron filtration is needed, it is recommended to use a 5-micron filter upstream.”

— Michael Guelker, Product Manager – Actuators and Air Supply Products, Festo

operating temperature never drops below 55°F (13°C).

- Membrane dryers suppress the pressure dew point in relation to inlet conditions. The air flows longitudinally through a bundle of parallel, hollow fibers. During this process, water vapor diffuses because of a partial pressure drop from the inside of the fibers to the outside. The vapor is exhausted out using purge air. Due to the purge air, the maintenance-free membrane dryer has a certain amount of constant bleed/air consumption.
- Adsorption dryers are used when pressure dew points of -40°F (-40°C) to -94°F (-70°C) are required. The dryers use molecular forces to bond gas or vapor molecules to a drying agent, such as desiccant beads. Since the drying agent is regenerative, two chambers are required. While drying takes place in one, the drying agent in the other has time for cold or warm regeneration. In devices with cold regeneration, some of the dried air is used to dry the adhesion agent. When warm regeneration is used,

the water evaporates as heat is applied. The drying agent must be replaced periodically (i.e., after 8,000 hours of service).

Types of Drains for Filter Units

There are a few different types of drains available for filter units:

- **Manual:** Condensate is drained manually by twisting the drain plug. These require a regular maintenance schedule (i.e., once per shift).
- **Semi-automatic/normally open:** This type of drain opens as soon as the compressed air is shut off.
- **Fully automatic/normally open:** This type of drain opens as soon as the compressed air is shut off, or a specified level is reached in the bowl.
- **Fully automatic/normally closed:** These filters open as soon as the compressed air is switched on and a specified level is reached in the bowl.
- **Electric drains** are also available, which can be opened/closed remotely with an electrical signal.

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7 = The class for solid particles
4 = The class for water
4 = The class for oil

ISO 8573-1:2010 Class	Solid particles			Water		Oil
	Max. number of particles per m ³	Mass concentration mg/m ³	Vapour pressure dew point °C	Liquid g/m ³	Total oil content (liquid, aerosol and vapour) mg/m ³	
0	0.1–0.5 µm	0.5–1 µm	1–5 µm	–	–	–
1	≤ 20,000	≤ 400	≤ 10	–	≤ -70	–
2	≤ 400,000	≤ 6,000	≤ 100	–	≤ -40	–
3	–	≤ 90,000	≤ 1,000	–	≤ -20	–
4	–	–	≤ 10,000	–	≤ +2	–
5	–	–	≤ 100,000	–	≤ +7	–
6	–	–	–	≤ 5	≤ +10	–
7	–	–	–	5–10	–	≤ 0.5
8	–	–	–	–	–	0.5–5
9	–	–	–	–	–	5–10
X	–	–	–	> 10	–	> 10

ISO 8573-1:2010 helps everyone communicate in the same language about compressed air quality.

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— William Gerald, CEM, Chief Energy Engineer, CalPortland
(feature article in August 2015 Issue)

“Compressed air is essential to any manufacturing process, particularly in the automotive industry, and it accounts for about 23 percent of total energy costs at our powertrain facility.”

— Mike Clemmer, Director/Plant Manager-Paint & Plastics, Nissan North America (feature article in October 2015 Issue)

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“Each of our 10 production plants has an Energy Coordinator who is part of the corporate energy team.”

— Michael Jones, Corporate Energy Team Leader, Intertape Polymer Group
(feature article in July 2014 Issue)

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COMPRESSED AIR FILTRATION 101

Properly Maintaining Filter Elements

To maintain efficient operation of filters, the filter elements need to be replaced periodically. How often this needs to be done depends on variables like the quality of the supply air and the hours of operation of the machine. As one approach, you can identify and set a preventive maintenance schedule that replaces the filter elements every 6 months.

A more reliable method is to use differential pressure sensors, which measure the pressure drop between a filter's supply and output pressure. The pressure drop indicates when the filter is becoming clogged. These can be electrical sensors that send a signal to a PLC, which can then alert the operator, or they can be visual indicators on the filter unit itself. For example, the indicator might show a green color when the filter element is clean, and a red color when the filter element is clogging up and needs to be replaced.

Defining Compressed Air Purity Levels with ISO 8573-1:2010

To help everyone communicate in the same language regarding air quality, international standard ISO 8573 was established in 2010 with definitions for compressed air quality. The air quality is defined with class ratings for three types of contaminants: solid particles, water condensate content, and oil content. The classes range from 1 through 9, and X, with the lower numbers representing higher air purity. It specifies the maximum permissible levels of contamination and particle sizes for the respective quality classes. The air quality class will help you identify what type of compressed air treatment products are needed. **BP**

For more information, contact Mike Guelker, tel: (631) 609-3721, email: michael.guelker@festo.com.

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Association of Independent Compressor Distributors (AICD) Membership Conference & Exhibition

2015

By Rod Smith, Compressed Air
Best Practices® Magazine



► The 2015 edition of the AICD was held May 17-19, 2015 at the Gaylord Texan Resort in Grapevine, Texas. Located in the Dallas Fort Worth area, this year's theme was to "Cowboy Up with the AICD" and country music star Tracy Byrd closed the deal at the Banquet!

Attendees received "Texas-sized networking benefits" with social events ranging from the AICD golf tournament, cocktail receptions, lunches and dinners. The size of the Gaylord Texan Resort offers variety yet keeps everybody in one place - and these networking events encourage attendees to meet one another or renew old acquaintances.

The meat of the event is provided by the conference and the exposition. AICD President, Patrick Lorenz of Rogers Machinery said, "With 50+ attending AICD member companies, our exhibitors took good advantage of the opportunity to show their new technologies and discuss business relationships." Lorenz further commented, "AICD Members appreciate the opportunity, in one trip, to meet existing and

prospective vendors and stay in tune with new product introductions occurring in the compressed air industry."

This was the 30th Annual AICD meeting and continues their new chapter, opening up the conference to all air compressor brands and distributors. Phil Kruger, the General Manager of Chicago-based Harris Equipment, is the first non-Quincy distributor on the Executive Board of the AICD. "We've been members for three years now-since they opened it up. The AICD takes market neutrality seriously and this is now reflected on the trade show floor, the conference content and even the Board." It's worth noting Mr. Kruger will assume the Presidency of the AICD in 2017.

The Conference

The speaker line-up is vendor-neutral and structured to help air compressor sales and service companies improve their businesses. Presentations included an economist updating members on the state of



"We've been members for three years now-since they opened it up. The AICD takes market neutrality seriously and this is now reflected on the trade show floor, the conference content and even the Board."

— Phil Kruger, General Manager of Chicago-based Harris Equipment

5 Leadership Traits Recommended by Bill Scales

- | | |
|--|--|
| 1. Have Energy | 4. Execute the plan.
Don't be half-hearted |
| 2. Energize Others | |
| 3. Have an edge that
will appear if people
are dishonest | 5. It's not the big that
eat the small, it's the
fast that eat the slow
<i>(this quote is on the
door to Bill's office)</i> |

the economy, a utility incentive program update from CLEAResult, and a Q&A Session featuring Ron Nordby and Bill Scales. I was not able to attend all the sessions but will provide some comments on those I did attend.

Ron Nordby discussed elements from his two-part article published with us titled Managing Change in the Industrial Air Compressor Industry. He reviewed challenges facing independent distributors in the rapidly-changing marketplace. It was interesting to see his portrait of how companies who embrace change, can profit from it. His personal experiences, derived from his career at John Henry Foster Minnesota, provided excellent examples to support his points.

Bill Scales delivered a fantastic presentation, detailing what management philosophies are deployed at Scales Industrial Technologies. He started with the inverted organization chart – flipped upside down so it creates a customer-facing organization. The customer is the boss and the most important employees are those with “customer-facing” roles. Supervisors, managers and CEO's are there to support, with training and development, those employees who deal with the company's customers. This is easy to say and so hard to do. Some other excellent points for management included:

- Embrace the company identity, vision and communicate it
- Publicize and internalize core values of the company
- Ensure all are focused on a single goal
- Be consistent in the message and repeat it
- Create a positive work environment
- Agree upon high performance standards

Another excellent presentation, titled “Monitoring Your Business,” was delivered by Joshua Wamser (President of Industrial Compressor Solutions) and Manny Cafiero (CFO of Scales Industrial Technologies).



Ron Nordby, Frank Brookshire, Curt Greifer and Keith Sportsman at the ELGI Compressors booth (left to right).



Eugene White and James Rogers (C.H. Reed) at the JORC booth reviewing condensate management products (left to right).



Jim McFadden, Janet Cafiero (Scales Industrial Technologies), Jane Sexton, Matt McQuillin and Matt Bennett (Lubes Technology) at the Nano Purification Solutions booth (left to right).

THE 2015 ASSOCIATION OF INDEPENDENT COMPRESSOR DISTRIBUTORS (AICD)



Mike Rotondo, Pam Tetterton and Randall Corthouts with the BEKO DRYPOINT X heatless desiccant air dryers (left to right).



Kasey Gould and Cheryl Kiker (AICD) with Don Joyce, John Medeiros and Angelo Mastrangelo discussing the launch of the new MTA DEiTech thermal mass refrigerated air dryers (left to right).



Duane McCarty and Josh Wamser (AICD Regional Director) from Industrial Compressor Solutions with Menno Verbeek at the VP Instruments booth (left to right).

They focused on creating and tracking financial and non-financial “Critical Success Factors” in your company. Each CSF is supported by Key Performance Indicators (KPI’s) which are accurate, timely and easy to obtain. Examples included:

- Financial: Cash CSF
 - Daily Cash Level KPI
 - Cash Projection KPI
 - Accounts Receivable Aging and DSO (Days Sales Outstanding) KPI
- Financial: Sales CSF
 - Sales Backlog KPI
 - Bookings KPI
 - Quotes per Month KPI
- Non-Financial: Vendor Relationships CSF
- Non-Financial: Lost Sales CSF

The Exhibition

The 2015 AICD Exhibition featured manufacturers of air compressors, compressor automation, air treatment, piping, chillers, heat exchangers, condensate management and instrumentation technologies. I can only highlight a few in this article - my apologies go out in advance to the many booths and firms not mentioned here due to the space limitations of the article.

ELGi Compressors had a lively booth where they were talking about having an installed base of 800 air compressors in the U.S. and about their soon to be launched oil-free rotary screw air compressors. Director of Sales Keith Sportsman said, “The two-stage oil-free OF Series has models from 125 to 400 hp.” ELGi also recently announced their expansion into a larger facility, based in Charlotte, to support their rapid growth strategy. They state, “We will be making room for the much anticipated launch of oil-free screw, reciprocating compressors, dryers and the line-expansion of the lubricated screw compressors to 300 hp.”

BEKO continues to promote their line of DRYPOINT X heatless desiccant air dryers. The product range is from 80 to 800 scfm and from what I understand, the market reception has been excellent. They feature the BEKOTouch PLC controller which has all spare parts programmed into it for each individual unit. This is an excellent service and parts-friendly feature. A humidity sensor in the bed extends cycle times under partial

MEMBERSHIP CONFERENCE & EXHIBITION

loads and galvanized piping and premium angle-valves are standard. BEKO has become a full-range desiccant dryer supplier offering heatless, heated and even high-pressure heatless drying systems to 7,250 psig.

Nano Purification Solutions continues to grow with Jane Sexton joining the team. They have become a full-line compressed air treatment supplier. JORC continues their exclusive focus on condensate management. President Eugene White said that business continues strong with both OEM and distribution sales channels. Their non-electric zero air-loss drain is seeing a lot of success as are their oil-water separators.

BOGE Compressors, led by General Manager Nitin Shanbhag, continues to grow in the U.S. and Canada. They featured their new direct-drive VSD air compressor in their booth. VP Instruments continues their excellent job highlighting the importance of compressed air flow measurement. VP Instruments U.S. Sales Manager Menno Verbeek is a road warrior constantly training end users and distributors on how to appropriately install flow meters.

Parker GSF introduced a new touch-screen interface controller for their heated and heatless desiccant dryers. Parker claims to offer more standard features on their controller than the market standard. Features include a 7" HMI, Allen-Bradley PLC, remote panel access via Ethernet, flash drive port for transferring data log, full color graphics touch panel control, and a broad array of alarm functions.

Hitachi America is also placing emphasis on their oil-free rotary screw air compressors. Air Technology Group Manager Camilo Villalobos said the market appreciates features like PTFE-Free coatings and stainless steel 1st and 2nd stage rotors. I also like their patented oil mist removal system recapturing oil mist. Product Marketing Specialist Amy Offord reported their move into a significantly larger facility in the Charlotte area has been completed and gone well.

Conclusion

As usual, the AICD was an excellent event. Again, my apologies to the many companies not appearing in this article – we simply run out of space. For anyone wanting more information on membership or exhibiting at the AICD 2016 event, taking place in downtown Chicago, please contact AICD at aicd@aicd.org or visit www.aicd.org. **BP**

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Sergio Castillejos, Ryan Sylvester, Allan Hoerner, Mike Peccia, Marc and Michael McCulley (Quality Air Services) at the Parker GSF booth (left to right).



Amy Offord was reviewing the DSP oil-free air compressor at the Hitachi America booth.



Justin Jones (Industrial Air Services), Kurt Schoeller, Derrick Taylor and Neil Gorlick (Fluid Aire Dynamics), Dennis Scales (Industrial Air Services) and Jerry Geenen in front of the BOGE SLF 40-3 direct-drive VSD rotary screw air compressor. (left to right).

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An Auditor's Notes on COMPRESSED AIR DRYER INSTALLATIONS PART I



By Chris E. Beals, President, Air System Management, Inc.

► After almost two decades of conducting compressed air system reviews, my interest has never wavered, because there's always something new to learn. One never-ending source of learning opportunities is the integration of air dryers into compressed air systems.

In compressed air systems, every adjustment or system modification has consequences, so, before making changes, it's important to understand how those changes will affect each piece of equipment. For example, simple things — such as lowering the compressor's pressure set point, or failing to maintain the compressor's aftercooler — can result in moisture contamination occurring out in the system. Why? Because the effects of these actions reduce the air dryer's capacity. In this article, I address some ideas that can make your system more reliable.

System Design Philosophy

Systems are more reliable when all of the air is dried. Many plants have both instrument and plant air headers, but don't dry the plant air, which shortens the life of tools connected to plant air drops, and potentially allows wet air to flow into the instrument air headers via inadvertent crossovers. Having a wet air header can result in winter freeze-ups and leaks at plant air drops.

Other systems use one main header to distribute wet air to each separate production area where a point-of-use dryer provides instrument air to that unit only. This approach multiplies the number of dryers, which increases maintenance and reduces reliability. One such facility had 42 point-of-use dryers with only 12 working. This meant that most of the instruments in the plant were operating off wet air that increased their failure rate.

A better way to design a system is to dry all of the air in the compressor station(s). In addition, if the plant isn't sacrificing plant air in favor of instrument air, they can address areas with low pressure by opening or installing crossovers between the plant and instrument air headers.

Piping Characteristics for Oil-Free Systems

To prevent rust from plugging up refrigerated dryers or the prefilter of desiccant dryers, the upstream piping in "oil-free" systems should be stainless steel. Many manufacturing plants may be able to use copper pipe, but the environment in some facilities — like paper mills, chemical plants, and refineries — corrodes copper and silver solder, so almost all of them forbid their use. Where the upstream piping isn't stainless steel, install a mist eliminator as close as possible to the inlet of refrigerated dryers or a desiccant dryer's prefilter. Installing a standard coalescing filter is less efficient, because they create a significant pressure drop and increase maintenance.

Temperature Characteristics

The greater the differential between the compressor discharge and the ambient temperatures, and the greater the distance between the compressor and dryer, the more likely it is for moisture to slug filters and dryers, and saturate desiccant. If temperature differentials and/or distances are significant, water will condense out of the compressed air stream as the air travels between the discharge of the compressor and the dryer. This water gathers in low points of the piping run and can travel in slugs of liquid as the compressed air flow propels it along. It's important to know that coalescing filters aren't designed to handle slugs of condensate, and that moisture and oil vapors pass through them. Also

AN AUDITOR'S NOTES ON COMPRESSED AIR DRYER INSTALLATIONS — PART I

coalescing filters prefer water over oil. These are some of the reasons filter manufacturers recommend installing a particulate filter upstream of a coalescing filter. A high temperature differential can also result in moisture condensing between the prefilter and the desiccant bed. Insulating the piping between the prefilter and the desiccant bed will prevent moisture from saturating the desiccant.

Mist eliminators can handle slugs of condensate, but vapors also pass through them. They can also be overloaded by a large, constant flow of liquid. Their low pressure drop and estimated 10-year element life are advantages of using a mist eliminator. A precooler, with a moisture separator or knockout pot installed upstream of the dryer, can prevent condensate from collecting in the pipe and slugging the prefilter and/or dryer, or condensing between the desiccant dryer's prefilter and its desiccant bed.

The compressor's aftercooler isn't considered a precooler unless chilled water is running through it. The purpose of a precooler is to reduce the temperature differential between the compressor discharge and the ambient temperatures. A precooler can also save energy when installed upstream of many styles of heated desiccant dryers. Installing a receiver, instead of a mist eliminator upstream of a desiccant dryer, can capture the condensate slugs, but many desiccant dryer installations will also require insulating the piping to prevent condensation from occurring between both the receiver and the prefilter, and the prefilter and the desiccant bed. Don't assume this won't occur in your system just because your plant is located in a warm climate, because we've seen it occur throughout the Gulf Coast.

Desiccant Dryer Failure Issues

In desiccant dryers, large quantities of compressed air can be lost when a valve on the dryer fails (in addition to purge air, stripping air, and cooling air losses). In some plants that have sufficient online

backup compressor capacity, these losses can go unnoticed. In other plants, they create production outages that cost millions. Installing flow meters up and downstream of each dryer and then monitoring the difference between them can locate the air loss. Installing a trip valve in the dryer's purge line, that's set to trip at a specified low pressure, can prevent the loss of production. However, a trip valve or a dew point monitor alarm is required to notify operators of the problem. One dryer manufacturer automatically closes the purge exhaust valves on falling pressure, but this approach doesn't protect the system against a purge exhaust valve failure.

Installing a check valve at the discharge of each dryer isn't a reliable solution to protect the system against a dryer valve failure, because it prevents access to upstream compressor capacity. For example, a large refinery had check valves installed downstream of their dryers, but when the dryer downstream of two compressors failed, it dumped the capacity of both compressors to atmosphere, which shut down the plant. The cost of that outage was in the millions.

Sizing Dryers

Using the rated pressure of the compressor to size the dryer is a common mistake. Dryers are rated for a certain pressure, and operating lower than that rated pressure reduces the dryer's capacity and increases the pressure differential across the dryer. For example, a rotary screw compressor rated for 125 psi operating in load/unload mode will typically cycle between 115 and 125 psi, so the highest average pressure will only be 120 psi. Many plants operate their 125-psi compressors at lower pressures, so be sure to verify the actual average operating pressure of the compressors and take into consideration any pressure drop between the discharge of the compressor and dryer.

The scfm capacity of an air-cooled refrigerated dryer is directly related to the dryer's inlet pressure and inversely related to the inlet



“Using the rated pressure of the compressor to size the dryer is a common mistake. Dryers are rated for a certain pressure, and operating lower than that rated pressure reduces the dryer's capacity and increases the pressure differential across the dryer.”

— Chris E. Beals, President, Air System Management, Inc.

and ambient temperature. They are typically limited to a maximum ambient temperature of 110°F. Our experience shows that if the ambient temperature can exceed 105°F, or the dryer is going to be installed in a dirty environment, a water-cooled version should be installed.

Some non-cycling refrigerated dryers can't maintain their rated pressure dew point (PDP) when flow drops below 47 percent of their rated flow, so review the dryer's CAGI data sheet before purchasing the dryer.

Plants with large compressed air systems, which only require a +40°F PDP, should consider installing a redundant style refrigerated dryer, because when a refrigeration compressor fails, they prevent wet air from flowing out into the system.

Desiccant dryers are sized based upon their inlet pressure and temperature. The inlet temperature of a standard dryer is typically limited to a maximum of 120°F, because over that temperature the adsorption ability of activated alumina, the desiccant most often used, decreases significantly.

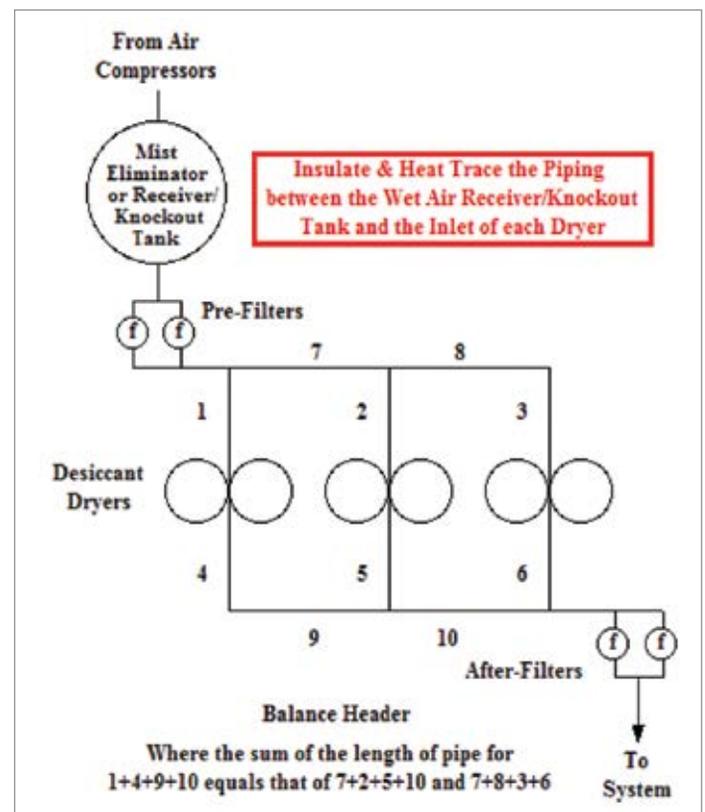
A “heatless” dryer can lose its heat of regeneration when located outside in lower ambient temperatures. So, you should either insulate and heat-trace the towers, or build sheds around them and install radiant heaters in the sheds. The word “heatless” is in quotations because the dryer actually uses the heat given off when the desiccant adsorbs moisture to regenerate the desiccant when the tower is in the regeneration portion of the dryer's cycle.

A desiccant dryer's rated capacity is its inlet capacity, which is almost always less than its outlet capacity. For some styles, manufacturers will beg to differ. However, we're referring to actual field observations and not the intentions of the original design. For example, “heatless” desiccant dryers have a combined 15 to 17 percent purge and depressurization air loss. While externally heated and internally heated desiccant dryers have purge air losses of 7.5 and 3 to 4 percent, respectively, they also have a cooling air cycle that starts after the purge air ends. Blower purge desiccant dryers have a cooling air cycle that consumes 5 to 7.5 percent of the dryer's capacity. Heat-of-compression dryers can have a stripping air cycle as well as open drainage losses. The reality is that drains fail, and, more often than not, they are bypassed rather than repaired, so these losses need to be considered in the design of the system.

After sizing a dryer, select the next larger size. This is a rule we don't vary from, because installing the exact size dryer required, for various reasons, almost never works out. For example, if end uses consume 1000 scfm, installing a 1000 scfm compressor and a 1000 scfm “heatless” dryer will only deliver 850 scfm. This application requires installing a 1200 scfm compressor along with a 1200 scfm “heatless” dryer. However, because we prefer to install one larger size dryer, we would select a different style dryer that has less purge losses. For example, installing a 1200 scfm compressor along with a 1500 scfm externally heated dryer delivers 1087 scfm.

Paralleling Dryers

Paralleling desiccant dryer packages can lead to an unbalanced flow through the dryers and a poor system PDP. To maintain a reasonably balanced flow through the dryers, remove the prefilters and afterfilters from the packages and parallel them upstream and downstream of the packages. Also, install a balance header or oversize the piping between the prefilter, dryers, and afterfilters. As mentioned above, some environments where the dryer is installed will require installing a mist eliminator or knockout tank and insulating the piping between it and the dryer inlet.



Paralleling desiccant dryer packages can lead to unbalanced flow and poor system PDP.

AN AUDITOR'S NOTES ON COMPRESSED AIR DRYER INSTALLATIONS — PART I

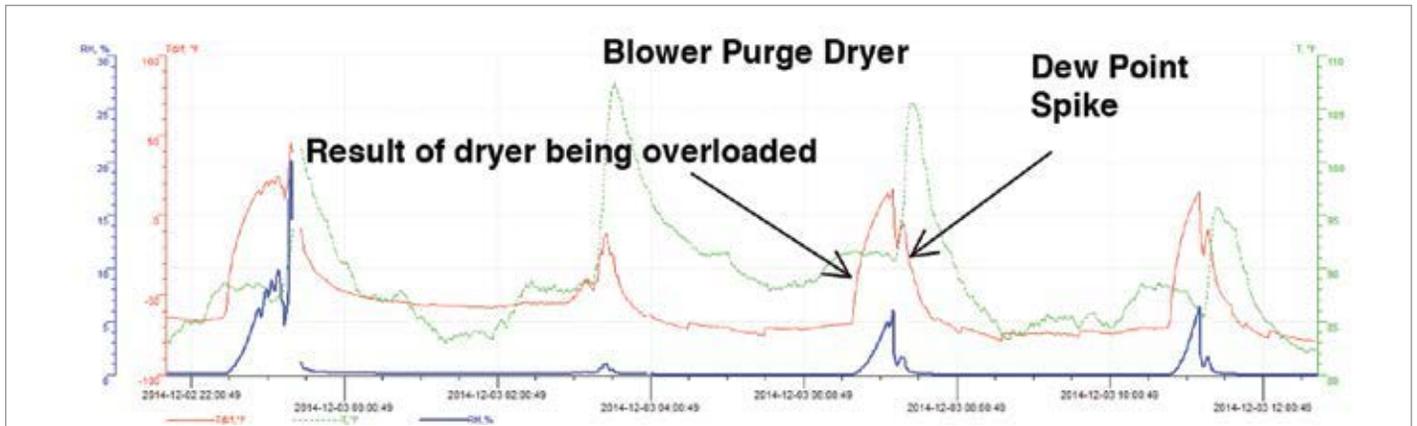


Figure 1: The PDP of a blower purge dryer dedicated to an oil-free rotary screw compressor

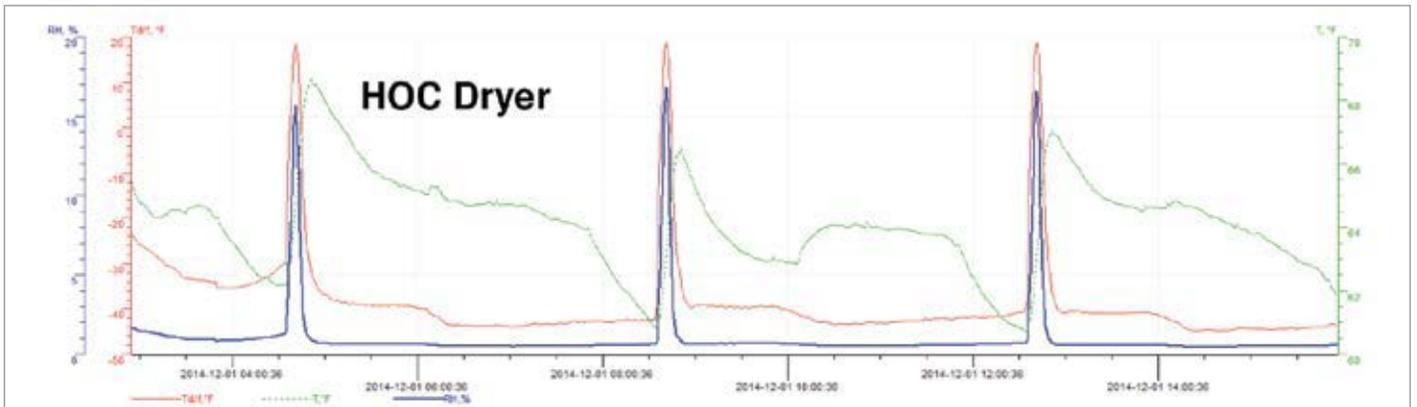


Figure 2: The PDP of a heat-of-compression dryer

Dew Point Spike Issues

Paralleling multiple heated desiccant dryers can result in a poor PDP. For example, Figures 1 and 2 display the PDP graphs of two heated desiccant dryers measured at their discharge. Figure 1 is the PDP of a blower purge dryer dedicated to an “oil-free” rotary screw compressor, while Figure 2 is the PDP of a heat-of-compression (HOC) dryer, which is located downstream of three centrifugal compressors. Both dryers operated on a fixed 8-hour NEMA cycle, or 4 hours on each tower. The red line indicates the PDP.

Figure 1 is an example of sizing the dryer to match the capacity of the compressor. In this case, the compressor was rated at 1538 acfm, and the dryer was rated at 1500 scfm. The dew point was measured during the winter when the capacity of the compressor was 1567 scfm. In addition, the compressor’s aftercooler needed to be cleaned, so its

discharge temperature was 105°F. The rotary screw compressor was used as a trim compressor, but was fully loaded for 1.5 hours when the HOC dryer was in the stripping air portion of its cycle. Note that after spiking, the PDP drops to between -50 and -70°F.

Figure 2 shows the PDP spiking to +20°F, after which, it drops to between -40 and -45°F. The HOC dryer was rated for 10,000 scfm with an actual flow of 7700 scfm. The PDP would probably drop to between -50 and -70°F, and a spike wouldn’t go above 0°F if a preheater was installed to increase the inlet temperature from 220°F to 350°F.

Figure 3 shows the combined PDP of the two dryers after the flows merged. The graph shows the PDP spike of each dryer, along with the overloading of the blower purge dryer. Depending upon the demand, the average PDP varies between -10 and -15°F and -15 and -20°F, which explains the freeze-ups that were occurring.

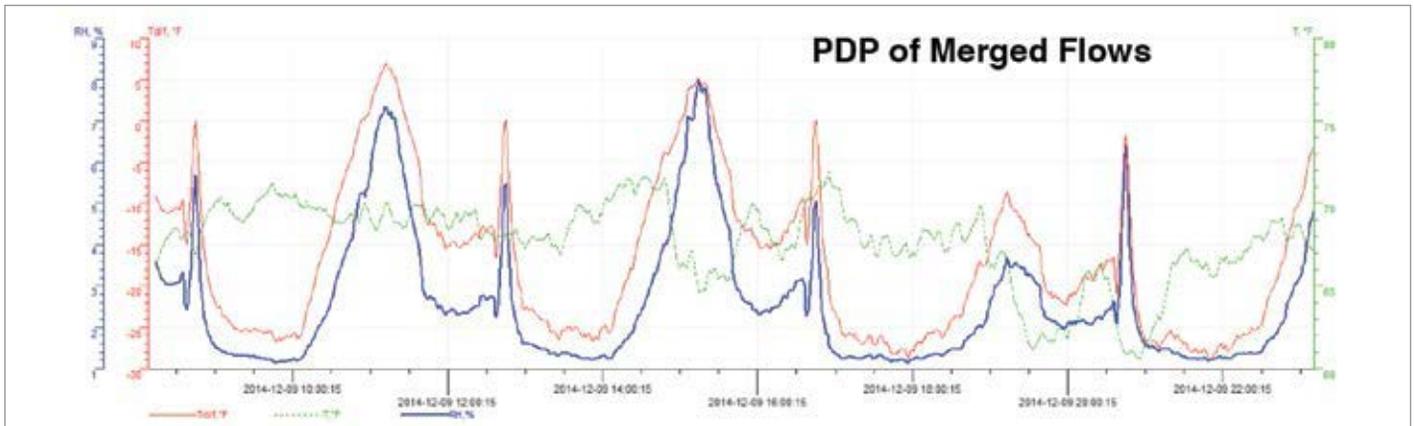


Figure 3: The combined PDP of the two dryers after the flows merged

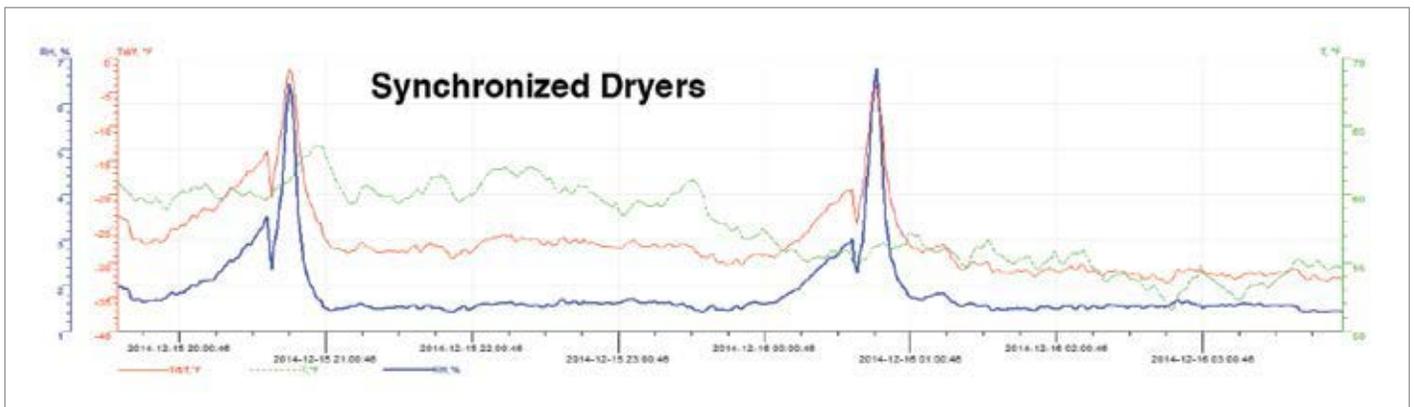


Figure 4: The effect on the PDP of synchronizing the dryer cycles

Figure 4 shows the effect on the PDP of synchronizing the dryer cycles. Synchronizing the dryers reduced the PDP spikes to one every 4 hours and improved the average PDP to between -25 and -30°F . Also, the PDP spike reduced from $+20$ to less than 0°F . Installing a preheater on the HOC dryer, raising the discharge pressure, and cleaning the aftercooler on the rotary screw compressor will further reduce the PDP spikes and the average PDP.

These PDP spikes don't appear to mix with one another in large chemical plants and refineries where the compressors and dryers are distributed throughout the plant. However, in smaller plants or wherever the heated dryers are paralleled, it can be an issue.

Conclusion

Part II of this article will cover other ways in which end users can make their compressed air systems more reliable. Topics will include the

difference between operating a desiccant dryer in a fixed cycle opposed to demand mode, operating heated desiccant dryers with cooling air turned off, and dealing with the unintended consequences of dedicating a desiccant dryer to a compressor. Additional commentary on this article will also be provided, since, as mentioned previously, there's always something new to learn.

For help sizing compressors, designing or auditing a compressed air system, sizing a receiver, or just calculating the cost of operating a compressor, check out the "Compressed Air Toolkit" iPhone App at <http://www.compressedairapps.com/>. **BP**

For more information, contact Chris Beals, tel: 303-771-4839, email: cbeals@earthlink.net.

To read more about *Compressed Air Treatment*, please visit www.airbestpractices.com/technology/air-treatment.

COMPRESSED AIR TECHNOLOGY AT 2015



By Clinton Shaffer, Associate Editor,
Compressed Air Best Practices® Magazine

► This year's World Energy Engineering Conference was held at the Orange County Convention Center (OCCC) in Orlando, Florida, from September 30 through October 2. The conference provides many educational tracks for energy managers to attend, including several hosted by the Environmental Protection Agency's ENERGY STAR® program and the Department of Energy's Better Buildings, Better Plants Program. I was fortunate to sit in on several of the Industrial Energy Management tracks, in which energy managers from companies like Raytheon, Nissan North America, and General Mills shared success stories and strategies for running energy management programs.

One of the more interesting industrial success stories came from Graham Thorsteinson, C.E.M., C.E.A., Cereal Division Energy Manager at General Mills. In his talk, he discussed the "zero-loss culture" at General Mills, where they have developed an internal continuous improvement program by drawing on ISO 50001 and the ENERGY STAR program. As Thorsteinson described, General Mills measures "energy as an ingredient" by metering energy use, analyzing the data, and correlating energy use to the product. With compressed air, for instance, General Mills will identify where it is used, how much energy it requires, and then identify the products associated with its use. From there, they can set aggressive targets for reduction.

The 15 energy engineers at General Mills view the ultimate product as the combination of both raw material and the energy required for its

transformation. By taking that approach, they manage energy waste in the same way as raw material waste, and optimize their processes accordingly.

On the Exhibition Floor

While the technical sessions were insightful, the exhibition floor was also bustling with activity. Manufacturers of air compressors, flow meters, and other compressed air measurement devices were present throughout the exhibition — along with energy auditors and compressed air consultants. All of these companies were presenting technologies and services geared towards helping energy managers monitor and reduce compressed air consumption.

This show report certainly does not provide an exhaustive list of everyone at the show, but it does provide information on some of the compressed air industry professionals who exhibited at WEEC 2015.

VPInstruments

Conveniently located catty-corner from the Compressed Air Best Practices® Booth, VPInstruments was at the show to present its line of thermal mass flow meters, including the VPFlowScopeM®. One of the unique features of the VPFlowScopeM is its capability to measure reverse flow. Many flow meters provide skewed measurements when bi-directional flow occurs, but the VPFlowScope can accurately report

how much air is moving, which direction the air is moving, and other key performance indicators.

It “can get spooky inside compressed air lines,” as Pascal van Putten told me, because the compressed air can move in different directions inside the piping. This makes the process of flow metering exceptionally difficult with certain system designs. The VPFlowScopeM is one of many tools from VP Instruments designed to help simplify that aspect of compressed air measurement.

Atlas Copco

My next stop was the Atlas Copco booth, where they were highlighting two of the company’s variable speed drive (VSD) technology offerings. VSD machines are superior to idling machines in many applications, and can yield significant energy savings if controlled correctly. With that in mind, the Atlas Copco team displayed the GA 7-37 VSD+ Series of oil-injected rotary screw compressors, which features a high efficiency Interior Permanent Magnet motor, and an Elektronikon® controller with algorithms designed to lower system pressure and energy consumption.

The Atlas Copco display also included the GHS VSD+ Series of oil-sealed rotary screw vacuum pumps, which were introduced earlier this year. With these vacuum pumps, Atlas Copco is leveraging its already-established VSD technology in a new market to help drive down the energy costs of vacuum systems.

Hitachi

At WEEC 2015, Hitachi presented their NEXTseries oil-free rotary screw compressor, the latest, most up-to-date version of the DSP line (Dry Screw Package). The company recently added the 22 to 37 kW size range to the NEXTseries, thereby increasing its range. The product line now has offerings from 30 to 300 hp, in both air- and water-cooled configurations, and featuring fixed and variable speed controls.

Hitachi also recently released its SDS product portfolio, ranging from 80 to 900 hp. The SDS compressors are oil-free screw machines, and they include single-stage units as well.

John Henry Foster

One of the compressed air equipment distributors and energy auditing companies at the show, John Henry Foster (JHF), came to WEEC to present its automation and auditing services. At their booth, I spoke with Bryan Crane, Ingersoll Rand Product Manager for JHF. During our discussion, he described their 3-day air auditing process, which covers



Pascal van Putten, CEO of VP Instruments, and Shane Egner, owner and operator of Egnergy, at the VP Instruments booth



From left to right: Bob Maurer, Key Account Manager; Keri Everhart, Communications and Branding; Steve Clasen, Regional Sales Manager; and Scott Stanley, Key Account Manager



Shawn Moon, Distribution Area Manager (left), and Amy Offord, Product Marketing Specialist (right), standing in front of Hitachi’s NEXTseries oil-free rotary screw compressor

COMPRESSED AIR TECHNOLOGY AT WEEC 2015



Bryan Crane of John Henry Foster standing at their booth at WEEC 2015



John Van Nostrand, Regional Sales Manager for FLEXIM Americas, standing alongside Ralph Jensen of Solares Controls



From left to right: Steve Santoro, Senior Sales Manager; Jonathan Monroy, Latin America Sales Coordinator; and Mike Johnson, Regional Sales Manager, of Vaisala

both the supply and demand specifications. Based in the Midwest, JHF offers engineering services and turnkey solutions, including vacuum and fluid cooling systems, in addition to their compressed air offerings.

FLEXIM

A manufacturer of flow-metering technology, FLEXIM sent representatives to present the company's non-invasive gas flow meters. As noted in an article from earlier this year, FLEXIM ultrasonic flow meters can help solve a variety of issues in manufacturing facilities by determining how much air, gas or liquid is actually flowing through a facility's piping — without the need for hot tapping.

At their booth, John Van Nostrand, Regional Sales Manager of FLEXIM Americas, discussed the FLUXUS® G ultrasonic gas flow meter. A clamp-on metering solution, the FLUXUS® G series of instruments uses the transit time difference correlation principle of ultrasonic waves to determine flow with an accuracy between ± 1 to 3 percent (depending on the application). These flow meters can be used for a variety of oil, gas and chemical applications, along with flow metering compressed air.

Vaisala

Vaisala presented a gamut of measurement devices at WEEC 2015. In regards to compressed air measurement, the company showcased a dew point transmitter for OEM applications with the DMT143. The device has a dew point measurement range of -70°C to 60°C , and it is ideal for applications like small industrial compressed air dryers.

When I spoke with Mike Johnson, Regional Sales Manager of Vaisala, he highlighted the auto-calibration capabilities of the DMT143 miniature dew point transmitter. During auto-calibration, the sensor heats itself to approximately 10°C , reducing the relative humidity (RH) value. It then cools, and the RH and temperature values are logged. During the transition, the offset correction value is obtained, which is used during measurement mode to ensure accuracy. The auto-calibrating capability enables the DMT143 to go 2 years without manual recalibration.

Best Practices for Compressed Air

On the final day of the show, Compressed Air Best Practices® Magazine moderated a session, during which experts from across the compressed air industry shared their expertise with energy management professionals. The session, called Best Practices for Compressed Air, provided insights and strategies for energy managers to bring back to their facilities and share across their companies. Our Publisher Rod Smith chaired the event, and he kicked off the session with his talk covering advanced trends in compressed air.

Frank Moskowitz, Airscan Audit Specialist with Atlas Copco Compressors, spoke next. His presentation, "Do I Need a VSD Compressor?" detailed the benefits of VSD compressors, and when they are applicable. Paul Edwards, the President of Compressed Air Consultants, followed with a discussion of lessons learned about compressed air and energy from the cement industry. Rounding out the series of presentations, Wayne Perry, Technical Director of Kaeser Compressors, discussed how master controls can improve the performance and efficiency of industrial air compressors. **BP**

For more information, contact Clinton Shaffer, email: Clinton@airbestpractices.com, tel: (412) 916-6693, or visit www.airbestpractices.com.

To read more about **Compressed Air Technology**, please visit www.airbestpractices.com/technology.



From left to right: Frank Moskowitz, Airscan Audit Specialist – Atlas Copco Compressors; Wayne Perry, Technical Director – Kaeser Compressors; and Paul Edwards, President – Compressed Air Consultants

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TECHNOLOGY PICKS

A5T Apache Air Compressor from DV Systems

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For more information, visit www.dvcompressors.com/apache or call tel: 704-799-0046

New DEiTech Compressed Air Dryer Line from MTA Offers Thermal Mass Performance — Without the Mass

Long regarded as a pioneer of cycling-based control of refrigeration capacity for both compressed air drying and liquid chilling products, MTA has developed a new, innovative system that matches the performance of its DE Thermal Mass Dryers, while reducing the unit footprint and weight by as much as 40%.

Patented innovations including an all-aluminum 3-in-1 heat exchanger design and "pulse technology" (a suction-side refrigerant flow control system) allow the DEiTech to "unload" as required and to cycle on and off when demand is low. Microprocessor control technology manages all functions and keeps the user fully informed about the dryer's operation. This winning combination provides dew point stability, energy efficiency and the lowest pressure drop in the industry. Zero loss condensate drains are standard on three phase models 200 scfm and above.

Following three years of successful use in Europe, the DEiTech Refrigeration Dryer is now available in North America. Eighteen models are available from stock in capacities from 10 to 1000 scfm. Single phase units are available through 325 scfm.

Please visit www.mta-usa.com or call tel: 716-693-8651 for more information.



MTA's new DEiTech line of compressed air dryers

RESOURCES FOR ENERGY ENGINEERS

TECHNOLOGY PICKS

Mattei Launches Blade SE Quality Air Station

Mattei Compressors, Inc., a leading manufacturer of rotary vane air compressors, recently announced its latest innovation, the BLADE SE Quality Air Station.



The new BLADE SE Quality Air Station from Mattei Compressors

The BLADE SE Quality Air Station combines superior performance with enhanced efficiency to deliver a constant supply of clean, dry compressed air — which means more value for your money.

The BLADE SE system features a BLADE Series compressor fully equipped with a built-in, air-cooled aftercooler; an intelligent

moisture separator with auto-drain; a built-in 1.0 micron prefilter; and an appropriately sized refrigerated air dryer for year-round operation. These new enhancements are mounted on an 80-gallon air receiver, which contains a single-point piping connection for simple installation.

Like all Mattei products, the BLADE SE utilizes proprietary rotary vane technology to operate at speeds as low as 1050 rpm. Running at a quarter of the speed of traditional rotary screw and piston compressors means the BLADE also uses up to 20 percent less energy than its competitors.

The BLADE SE Quality Air Station is a result of Mattei's steadfast dedication to the development of innovative, cutting-edge products.

For more information, visit www.matteicomp.com.

Parker Hannifin Releases Second-Generation SCOUT™ and SensoNODE™

Parker Hannifin, a leader in motion and control technologies, is enabling new possibilities in condition monitoring for predictive maintenance with its second-generation Industrial Internet of Things (IIoT) solution, SensoNODE™ Blue and SCOUT™ Mobile. As global competitiveness drives companies to find new ways to improve efficiency and product quality, Parker is advancing conditioning monitoring across multiple applications and industries.

SensoNODE Blue and SCOUT Mobile help companies eliminate massive information gaps by catching and reporting performance fluctuations that could damage assets over time. By monitoring assets and tracking data, users can employ predictive maintenance routines that allow them to address even the smallest issue before it snowballs into a serious problem.

The wireless SensoNODE sensors are designed for portable and diagnostic applications with mobile devices, including phones and tablets. Small and simple to operate, SensoNODE Blue sensors monitor assets for changes in pressure, temperature and humidity. Users can then receive that data via SCOUT Mobile, which converts it to useful analytics that can be used to track real-time and historic trends with an easy-to-use interface. SCOUT Mobile can also alert users to unexpected condition changes that may damage assets.



The SensoNODE line of sensors for monitoring pressure, temperature and humidity

“We designed SensoNODE Blue and SCOUT Mobile with prevention in mind,” said Dan Davis, product sales manager for SensoNODE/SCOUT. “Traditional monitoring for everyday applications comes with a number of challenges, from unplanned downtime and unnecessary

shutdowns, to high maintenance costs and potentially dangerous situations for workers. Our solution helps to alleviate those with a wireless, accurate solution that monitors your assets to get you the vital information you need to keep processes going.”

In addition to helping to keep maintenance costs down and preventing unscheduled downtime, information gathered with the SensoNODE Blue and SCOUT Mobile solution can help companies refine their processes and optimize their systems. Making better, data-driven decisions ensures peak performance of assets and processes, resulting in the highest level of product quality.

For more information, visit parker.com/conditionmonitoring.

TECHNOLOGY PICKS

Tsunami Releases New Air Prep Kit

Commonly referred to as the fourth utility, compressed air systems are vital for everyday business. Failure to monitor your compressed air system can cost thousands of dollars in inefficiencies and cause severe damage to capital equipment.



The new Tsunami Air Prep Kit for monitoring compressed air

Having an efficient and effective air system in place prolongs equipment life, reduces utility costs, and — in certain applications — provides a fast road to air quality regulatory compliance. The Tsunami Air Prep Kit is designed to help diagnose and eliminate problems in compressed air systems. Whether you are troubleshooting your own air quality or servicing a customer, Tsunami ensures accurate readings time and time again.

Each kit comes complete with a CFM Flow Meter and Humidity Monitor, providing accurate measuring of humidity, dew point, temperature, and CFM usage. The CFM Test Kit comes with a regulator and CFM flow meter, and provides information with an easy-to-read graph.

The Tsunami Air Prep Kit also features an LCD screen, and comes complete with sensor filtration.

For more information, visit www.gosuburban.com.

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A Publication of: **Smith Onandia Communications LLC**
37 McMurray Rd. Suite 106
Pittsburgh, PA 15241

Compressed Air Best Practices® is published monthly except January-February combined by Smith Onandia Communications LLC, 37 McMurray Rd. suite 106, Pittsburgh, PA 15241. Application to mail at Periodicals postage prices is pending at Pittsburgh, PA 15290. POSTMASTER: Send address changes to: Compressed Air Best Practices®, 37 McMurray Rd, Suite 106, Pittsburgh, PA 15241.

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