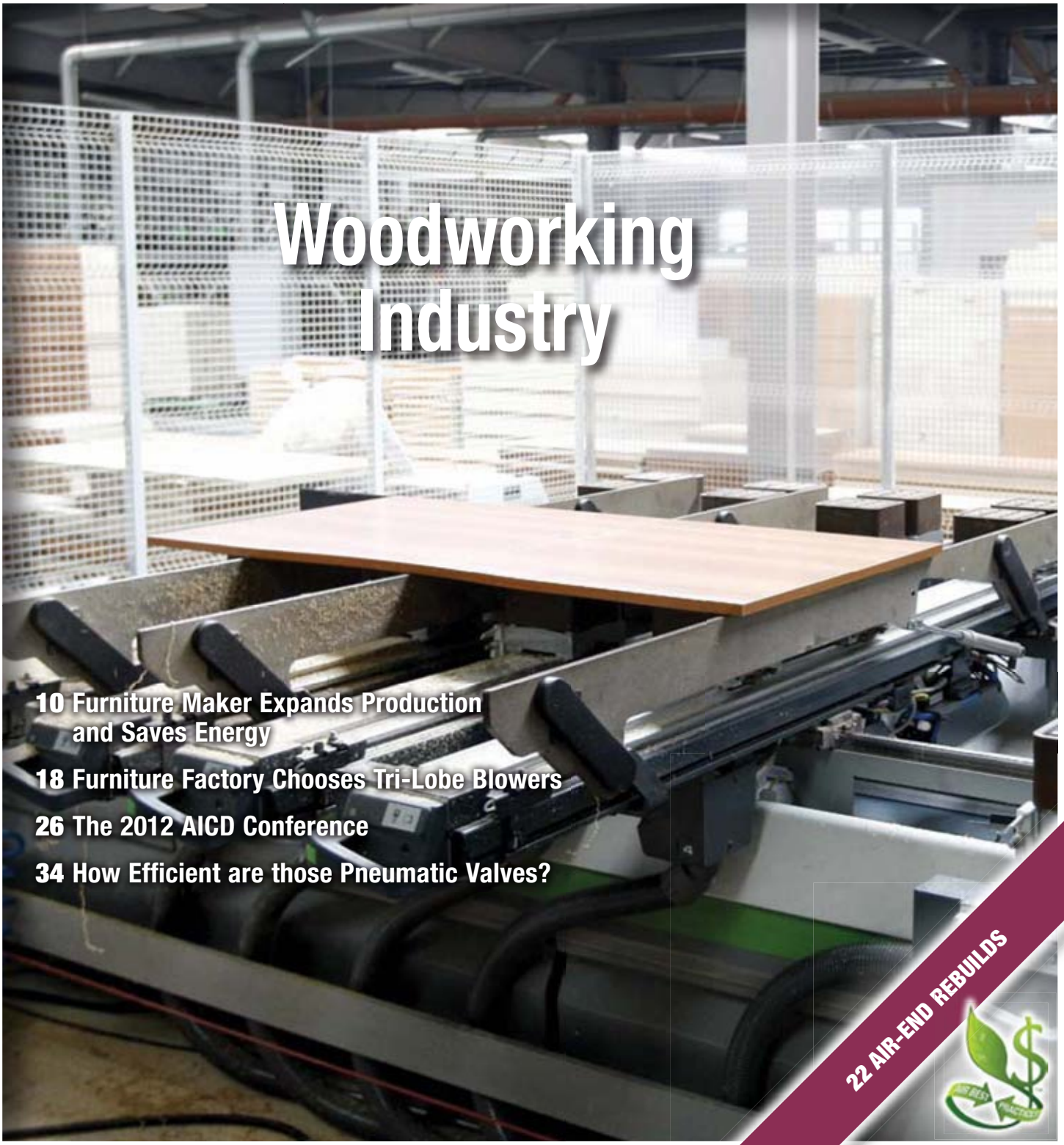
The Magazine for ENERGY EFFICIENCY in Compressed Air, Pneumatics, Blower and Vacuum Systems

COMPRESSED AIR BEST PRACTICES

airbestpractices.com

July 2012



Woodworking Industry

Driven by Efficiency
Setting New Milestones in Performance

Sustainable Productivity

Hey, I'm Trey, Product Marketing Manager at Atlas Copco Compressors. It's my great pleasure to introduce the next generation of the **GA oil-injected screw compressor range.**

The GA 40-125 horsepower range has been redesigned in line with Atlas Copco's commitment to continuous innovation. Featuring new and improved components that provide unparalleled performance, sustainability, efficiency and reliability, the VSD models deliver up to 35% energy savings, while the premium efficiency fixed speed models offer industry leading Free Air Delivery (FAD).

Visit our dedicated website to learn how this new compressor range can boost your productivity **www.atlascopco.com/drivenbyefficiency** or call **866-688-9611** to learn more about us, our products, and how we have earned and will continue to earn our reputation.

Atlas Copco

Hitachi SRL Series Oil-Free Air Compressors

Innovation • 100% Oil-Less Design • Superior Sound Quality

SRL Series Simplex
(Single Motor/Single Scroll Configuration)

SRL Series Features

- Patented Labyrinth Lap for extended life and reliability
- World's Largest Unitary Scroll (7.5HP)
- Microprocessor standard with Control Cycle Logic for compressor longevity
- Multi-stage cooling for stable discharge temperatures
- Highest Air Purity
- Environmentally Friendly
- Low cost of operation
- Ultra low sound with standard quiet enclosure
- Space Saving Footprint
- Product Range
  1.5kW — 5.5kW Simplex Units
  7.5kW — 16.5kW Multiplex Units
- Pressure applications up to 145 PSI
- Energy Saving Variable Drive Mode (Multiplex Only)

SRL Series Multiplex
(Multiple Motor/Multiple Scroll Configuration)

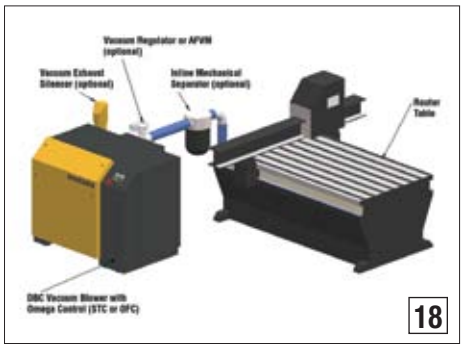
Interested to become an Authorized Distributor for Hitachi SRL Series Compressors? See our ad in the Job Market Section.

Hitachi's history of success and proven experience in scroll technologies has enabled Worldwide Innovation of producing the World's First Scroll for air compression. With over 20+ years experience in scroll compression, the SRL Series of Oil Free Compressors represents our alignment of value for the discriminating air user.

Hitachi America, Ltd. / Air Technology Group
6901 Northpark Blvd., Charlotte, NC 28216 Tel: 704.494.3008 x28
www.hitachi-america.us/airtech; airtechinfo@hal.hitachi.com
Hitachi Industrial Equipment Systems Co., Ltd.

HITACHI
Inspire the Next

SUSTAINABLE MANUFACTURING FEATURES



COLUMNS

FROM THE EDITOR | Woodworking Industry

Compressed air, blowers, vacuum, and pneumatics all play an important role in the woodworking industry. Furniture manufacturers, for example, deploy CNC machines to automate the cutting process and vacuum is key to holding the wood down in place for accuracy.

A furniture maker recently decided to use tri-lobe blowers to create a low-vacuum, high-flow situation to reduce the product rejections they were seeing. Michael Camber, from Kaeser Compressors, provides us with a very interesting article on this technology replacement away from the traditional high-vacuum, low-flow solutions typically used.

Our audit of the month story provides an excellent example of how a furniture factory was able to expand production and their compressed air use — and reduce the energy costs associated with compressed air. Hank van Ormer, from Air Power USA, once again illustrates the benefits of a comprehensive system assessment. This factory has four buildings, four separate systems, five brands of air compressors installed, and is running at very low loads. This story is well worth reading and typical of so many plants.

Air compressors are highly reliable machines and almost all are built to extremely high quality standards. Nevertheless, all machine components can be vulnerable to external variables and the airends on rotary screw compressors are just that. Lee Levisay, from The PROS Company, provides us with an interesting article on how to diagnose and rebuild airends with an article titled, "The Art of Airend Forensics."

Pneumatics continues to be a growing focus for us and we appreciate an article from Richard Bullers, from SMC Corporation, titled, "How Efficient are Those Pneumatic Valves?" Pneumatic valves are a key component on the "demand side" of a compressed air system and more often than not, they were not selected with energy consumption in mind.

Finally, we produce our annual report from our visit to the 2012 Association of Independent Compressor Distributors (AICD) Meeting. Combining learning, relaxation, and business opportunities is something this group has got down pat! We also have a very interesting article, from Ron Marshall of the Compressed Air Challenge® on the benefits of compressed air training at a gold mine in Canada. Don't miss it.

Our mission is to distribute educational and motivational content on the **positive work** being done every day by people, like you, who get their hands dirty and get the job done with profitable energy efficiency projects. We thank the authors above for sharing their knowledge and thank you for your support and for investing in ***Compressed Air Best Practices®***. BP

ROD SMITH
Editor
Contact: 412-980-9901, rod@airbestpractices.com

COMPRESSED AIR, PNEUMATICS, VACUUM & BLOWER INDUSTRY NEWS

Hitachi America, Ltd. Relocates to Larger Facility in Charlotte, NC

Larger Facility Needed to Support Forecasted Growth

Hitachi America, Ltd., Industrial Components and Equipment Division, announced that it is relocating its Charlotte, NC facility to a larger facility. While remaining in Charlotte, the new facility is 38,400 sq. ft., increasing the company's working space by 42%. The larger facility is needed to accommodate projected growth in sales. The company anticipates that the relocation will be completed by the end of June 2012.

"Our customer base in the Americas is spread out, spanning from Canada down to Argentina," said Charlie Takeuchi, Senior Director, Industrial Components and Equipment Division, Hitachi America, Ltd. "Over the past 10 years, our division's business has experienced double digit growth on a year over year basis, and we are anticipating further growth in the US manufacturing industry as well as in Latin America. We had a demonstrated need to increase our capability to support and satisfy the needs of our customers. In addition to moving into a larger facility and increasing the size of our staff, we are also installing product assembly and modification capabilities, which will enable us to quickly and efficiently respond to the needs of our customers in the Americas. In today's industrial business environment, customers are looking for partners who can deliver products and services at faster speeds than ever before. Being able to meet this need is of primary importance to Hitachi."

Hitachi America, Ltd. opened its first facility in Charlotte in 2007. The facility served as a Distribution Center for Hitachi's line of Frequency Drives (inverters), Industrial Air Compressors and industrial ink jet printers as well as facility for conducting hands-on training for its sales force and customers. With larger space, Hitachi will now have larger, better equipped classrooms in which to conduct product training as well as additional storage and office space to accommodate growth anticipated over the next 10 years. www.hitachi-america.us

HITACHI
Inspire the Next

Mattei Compressors, Inc. Acquires Transit Engineering Services

Jay R. Hedges, General Manager of Mattei Compressors, Inc, of Baltimore County, Maryland, announced that Mattei has acquired 100% of the stock of Transit Engineering Services (TES), a leading U.S. packager of onboard air compressors for metro, subway, light rail and people mover applications. An integral part of a global strategy to move aggressively into onboard transit air applications, the company will operate as Mattei Transit Engineering (MTE), and now offers a full line of highly engineered Transit Air Systems supporting onboard pneumatic operations including brakes, doors, controls, safety barriers and other systems from 1.5 hp (5 cfm) to 75 hp (329 cfm).

"Public transit is a growing need throughout North America and the world, as urban area populations increasingly turn to public transportation to reduce traffic congestion and improve the environment", said Hedges. "The Market driven demand for improved transit infrastructure in cities and airports in the U.S. and around the world continues to increase, creating demand for safe, environment friendly, reliable and affordable on board air. We will continue to build on our strong alliances with the rail and people mover segments, while expanding into electric and hybrid buses, trucks, and locomotive applications", said Hedges.

"Our Italian affiliate, Mattei SPA provides MTE with world class rotary vane air ends for transit and other OEM applications giving us an advantage in the market place", said Nick Brearey, Technical Director of Mattei Transit Engineering, and former owner of TES. "We provide an alternative to piston and screw compressors technologies which have struggled under the demanding operating conditions in transit applications where durability, low oil carryover and cost of operation are crucial", added Brearey.

"Our global entry into On Board Transit Air Compression is a strategic decision as we position Mattei's Rotary Vane Technology to expand into new OEM applications and new markets where we have competitive advantages", said Giulio Contaldi, CEO of Mattei SPA based in Milan, Italy. "As the world's largest manufacturer of Rotary Vane compressors, the RVM Series, a line of durable, high quality transit air ends, meets the current and future needs of the Global Transit Market", said Contaldi. "The strategic acquisition of TES gives Mattei a global transit engineering resource lead by Mr. Brearey, and offers an opportunity for global growth, particularly in the U.S. where Mattei Compressor Sales continue to gain market share."

COAIRE AIR COMPRESSORS

CLEAN AIR IN MOTION™

INDUSTRIAL • HOSPITALS • LABORATORIES • PUBLIC TRANSPORTATION

- Oil-less scroll design for 100% clean air
- Various configurations for OEM applications
- Scroll enclosures up to 50 HP
- Multiplex units are microprocessor controlled
- Compressors can be individually mechanically & electrically isolated
- "D" Series with a built-in refrigerated dryer

OEM PRODUCT OFFERINGS

Base mounted scroll compressors -horizontal configuration

Base mounted scroll compressors -vertical configuration

Oil-less piston air ends 1 through 7.5 hp

As an industry leading manufacturer of oil-less scroll and oil-less piston compressors, we are able to offer the market innovative compressor designs. Whether you require a bare compressor or a 50 hp scroll enclosure, we have the perfect fit for your application. Our products can save on both energy and maintenance costs. All of our products are built in an ISO registered facility. If you require oil-less compressed air, look no further than Coaire.

Interested in becoming a distributor? Call or email us today!

www.coaire.com sales@coaire.com 562-991-3289

COMPRESSED AIR, PNEUMATICS, VACUUM & BLOWER INDUSTRY NEWS

TES, now operating as Mattei Transit Engineering has relocated into the facilities of Mattei Compressors, Inc., in Baltimore County. In addition to MTE's Transit Compressor Products, Mattei offers a full range of OEM Air and Gas Compressors for highly engineered compressed air packagers and natural and methane gas compressors for solid waste and landfill methane, and natural gas applications. 2012 marks the 25th anniversary of Mattei Compressors, Inc, in the United States. www.matteicomp.com

Ultrachem Announces Major Solar Photovoltaic Project For Its Headquarters Facility

Ultrachem, an industry leader in specialty lubricant solutions, announced today that it plans to install a new solar photovoltaic system on the roof of Ultrachem's Corporate Headquarters facility in New Castle, Delaware. Once complete, the system will generate enough electricity to serve the facility's annual electricity needs.

"Ultrachem is committed to responsible, environmentally-sustainable business practices and we are excited to take the next step toward reducing our overall carbon footprint," said Bob Whiting, President of Ultrachem.

The 185 kilowatt solar photovoltaic system will consist of more than 750 individual solar panels and will produce more than 200,000 kilowatt-hours of clean electricity per year — which equates to the reduction of more than 270,000 pounds of carbon emissions annually. The project is using Delaware-manufactured solar panels and will be installed by a Delaware-based installation team.

Ultrachem, one of the oldest specialty lubricants compounders and an ISO 2001-2008 certified company, chose to partner with EnterSolar, a leading developer of commercial solar PV systems, for the project which is set to begin construction in mid-2012. The project is participating in the Delaware SREC (Solar Renewable Energy Certificate) Pilot Program and will be interconnected to the New Castle Municipal Services Commission's utility system. www.ultracheminc.com

ULTRACHEM INC
PREMIUM SYNTHETIC LUBRICANTS

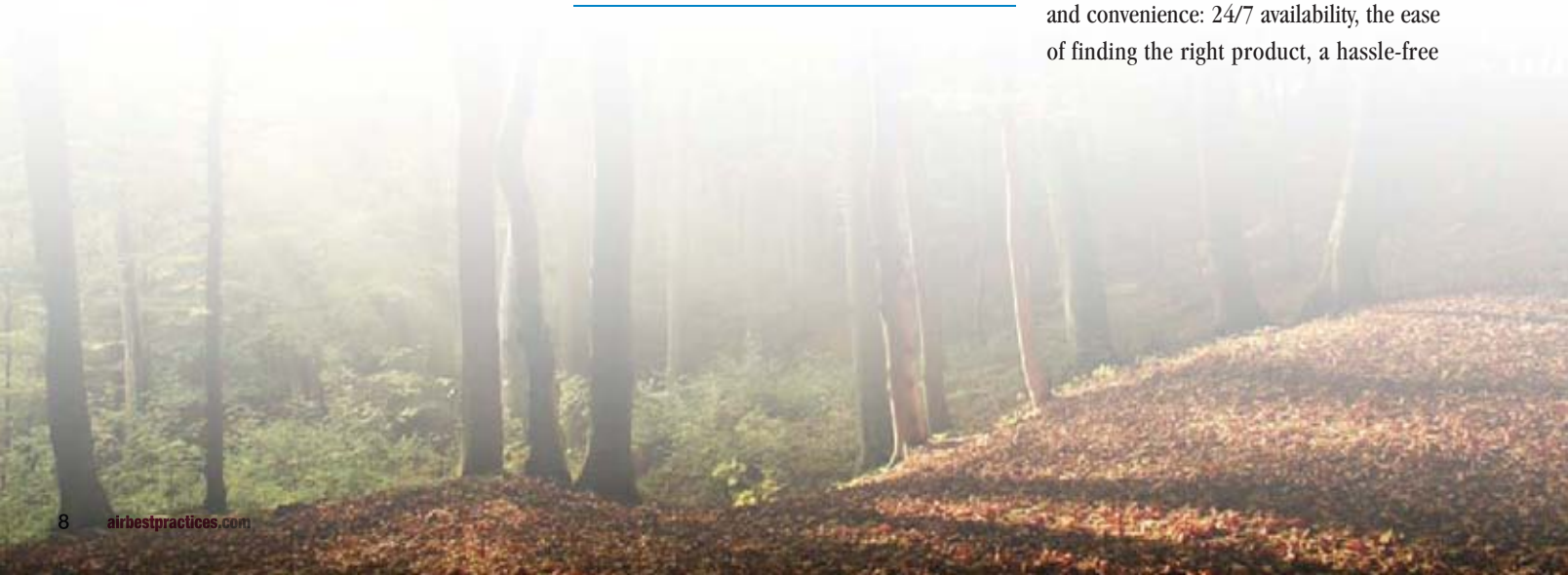
Vaisala Online Store Opens in North America

Vaisala, global leader in environmental and industrial measurement, opens its online store for customers in North America. The store carries a selection of Vaisala's industrial instruments, ranging from hand-held meters to configurable transmitters.

First launched in 8 European countries in January, the scope of the store has gradually been extended, both in terms of product offering and geographical reach. It now comprises close to 200 instruments, spare parts and accessories, and serves customers in 44 countries worldwide. The latest additions to the offering include the recently launched Vaisala HMW90 Series HUMICAP® Humidity and Temperature Transmitters and the Vaisala HUMICAP® Structural Humidity Measurement Kit SHM40, for example.

"We wanted the store to provide another world-class customer experience to complement our existing sales channels. It is directed to customers who know what they need and appreciate a convenient and easy channel that is always available. Our local sales experts continue to serve more complex needs," says Lauri Tuomaala, Director for Vaisala's Controlled Environment Sales.

"The online store is all about functionality and convenience: 24/7 availability, the ease of finding the right product, a hassle-free



and secure payment, and a reliable delivery process. Buying an instrument doesn't get any easier."

The advanced functionalities of the store, such as a smart Product Finder, help the customer quickly find the most suitable product. Up-to-date documentation and user guides are also easily accessible for fully informed purchase decisions, and a live chat feature allows the customers to contact Vaisala's customer service team by instant messaging.

The online store is available at https://store.vaisala.com

VAISALA

SMC Recognized by the ION Network's "World's Greatest!...."

Watch SMC Corporation of America in July 2012 on the ION Network's "World's Greatest!...." to discover how SMC has become the "World's Greatest!...." pneumatic and instrumentation company. It will be Episode 164 on the ION Network.

Get an insider's perspective of how SMC Corporation of America, a subsidiary of SMC Japan, supports the U.S. manufacturing sector with over 600 direct sales specialists backed by our domestic and global production network.

SMC's North American Corporate Headquarters (Noblesville, IN) has extensive engineering capabilities including direct access to SMC's global network. Together, over 1,000 engineers bring to market more than 100 new products annually. www.smcusa.com

SMC®

To read more ***Industry News*** articles, visit www.airbestpractices.com

THE SYSTEM ASSESSMENT

Furniture Factory Expands Production While Reducing Energy Costs

By Hank van Ormer, Air Power USA

Introduction

This furniture factory, located in the Midwest, was spending $47,000 annually on energy to operate the air compressors in their five production buildings. The factory calculates energy costs using a blended electric rate of $0.077 /kWh and runs on average only 2400 operating hours per year.

The demand for compressed air was primarily made up of many small users (pneumatic tools). The demand profile, therefore, is relatively stable overall and does not have any major, intermittent "demand events". Demand was only averaging 2400 hours per year at the time of the system assessment.

A key component to this system assessment, however, was to help this factory design the compressed air system for a planned expansion in production within twelve months.

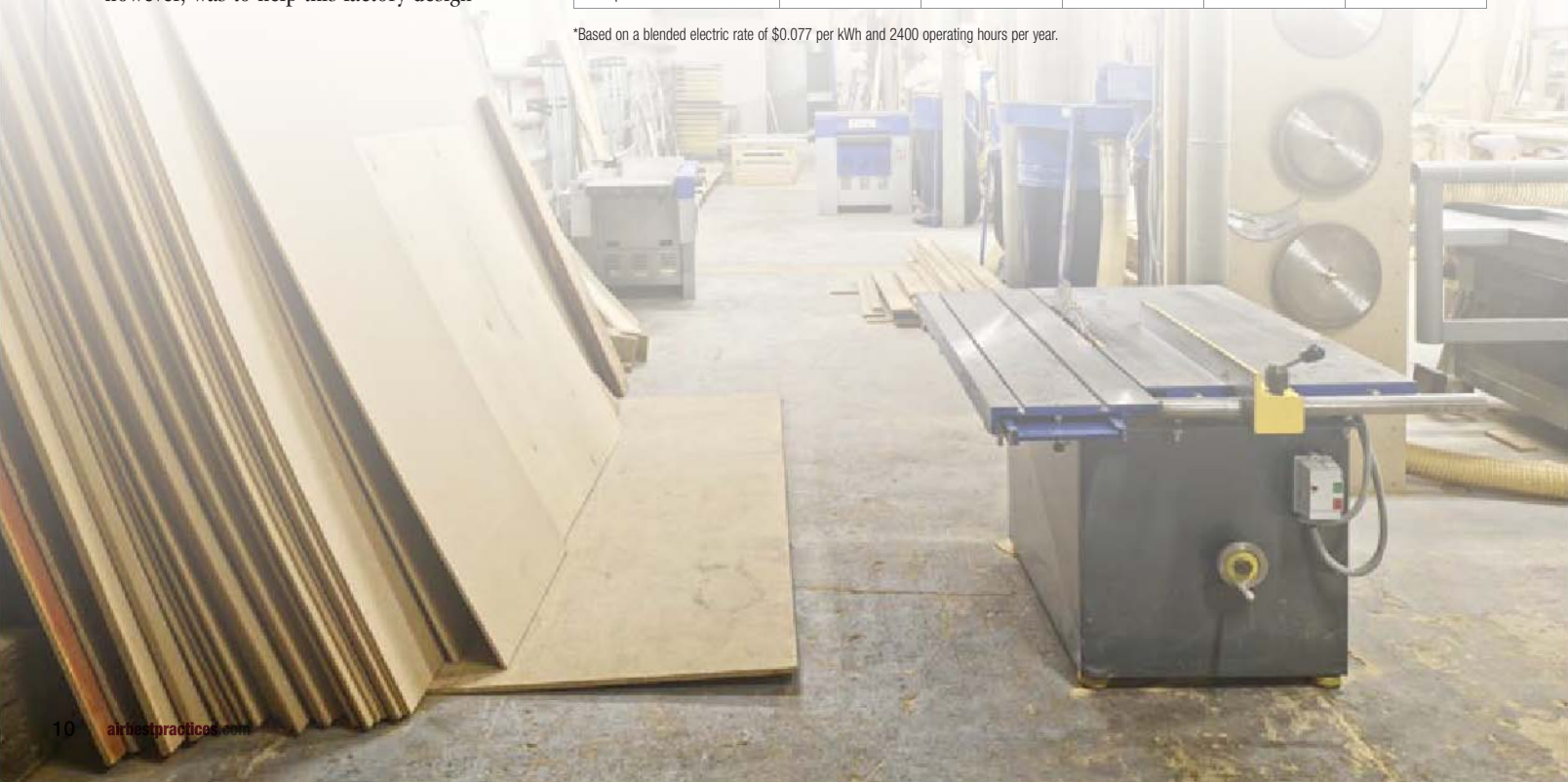
This company has grown over the years and has four separate production buildings. Each building has it's own compressed air system that is significantly oversized. The goal of this project will be to evaluate the existing systems, forecast the future air demand of each building, and to prepare the compressed air systems for that future demand.

Due to article length space constraints, we will only show parts of the supply-side evaluation that was done, details from the leak audit, and how we forecasted future compressed air demand.

TABLE 1. KEY AIR SYSTEM CHARACTERISTICS — CURRENT SYSTEM*

Measure	BUILDING 1	BUILDING 2	BUILDING 4	BUILDING 5	TOTAL
Average System Flow	248 cfm	101 cfm	244 cfm	108 cfm	701 cfm
Avg Compressor Discharge Pressure	109 psig	110 psig	119 psig	110 psig	110 psig
Average System Pressure	107 psig	105 psig	115 psig	105 psig	108 psig
Input Electric Power	107 kW	30.8 kW	68 kW	49 kW	254.8 kW
Specific Power	2.32 cfm/kW	3.28 cfm/kW	3.59 cfm/kW	2.20 cfm/kW	2.75 cfm/kW
Ann'l Elec Cost for Compressed Air	$19,774 /year	$5,692 /year	$12,026 /year	$9055 /year	$47,097 /year

*Based on a blended electric rate of $0.077 per kWh and 2400 operating hours per year.



Supply-Side System Overview

The production facilities are comprised of Production Buildings (#1, #2, #4, and #5). In the past, each of these operations has tended to operate as separate profit centers. Now, all the production facilities will work together as one.

Reviewing the current operating profile of each building's compressed air system and analyzing the opportunities is a key component of the system assessment. As this company has grown over the years, a multitude of different air compressors and dryers, from different manufacturers, have been added to the system. Installed are rotary screw air compressors from Gardner Denver, Sullair, and Palatek, and a reciprocating air compressor from Champion. A variety of refrigerated air dryers and filters are installed from VanAir, AirTek, Ultrafilter, Deltech, and Arrow.

In general, plant personnel state that they do not have problems with air pressure or flow and that the air compressors have been reliable. As we will see, this is due to a significant over-supply situation in a plant where the air compressor are all running part-loaded and are seeing only 2400 hours of duty per year.

Plant personnel do say they have recurring problems with the presence of moisture in the compressed air system. The system assessment will identify several dryers that are not functioning properly or at all.

Compressed Air Leak Survey

A survey of compressed air leaks was conducted in each building and 55 leaks were identified, quantified, tagged, and logged. Potential savings totaled 116 cfm for the 55 leaks that were identified (Plant #1 — 66 cfm; Plant #2 — 10 cfm; Plant #4— 30 cfm; and Plant #5 — 10 cfm). In a system such as this one, 90 to 95% of the total leaks were located

THE SYSTEM ASSESSMENT

Furniture Factory Expands Production While Reducing Energy Costs

in the pneumatic circuits of the machinery — not in the distribution system.

We recommended an ultrasonic leak locator be purchased so the plant can implement an ongoing leak management program. With a few minor exceptions, most of the leaks could not have been found without the use of an ultrasonic leak detector and a trained operator. Leak locating during production time with the proper equipment is very effective and often shows leaks that are not there when idle. However, a regular program of inspecting the systems in "off hours" with "air powered up" is also a good idea..

TABLE 2. BUILDING #1 PLANNED DEMAND

CURRENT PRODUCTION	TOOLS	CURRENT PRODUCTION TOTAL AIR USAGE	PLANNED PRODUCTION ADDITIONAL TOOLS	PLANNED PRODUCTION TOTAL AIR USAGE
Framing	13	248 cfm total air usage. Subtract sewing air 40 cfm = 208 cfm ÷ 40 tools = **5.2 cfm / tool**	21	Total additional tools @ 5.2 cfm each = **400 cfm** additional air required
Upholstering	27		56	
Sewing	25		0	

TABLE 3. BUILDING #1 COMPRESSED AIR LEAKS

NO	LOCATION	DESCRIPTION	EST SIZE	EST CFM
1	Button Machine	Cylinder	Medium	4
2	Cutting Room	QDC	Small	2
3	Sewing room	Hole in tube	Small	2
4	Sewing room	Lubricator	Small	2
5	Trap	Drain / Wall	Small	2
6	Machine 11	Filter / Regulator	Small	1
7	Machine 43	Filter / Regulator	Small	1
8	Machine 40	Hole in tube	Medium	4
9	Zipper Slider	Filter / Regulator	Small	2
10	Panel area	Hole in tube	Small	1
11	Panel area	QDC	Small	2
12	Line 4	QDC	Small	2
13	Main line expansion	Valve	Medium	4
14	Line 1 cushion	QDC	Small	1
15	Line 1 cushion	QDC	Small	2
16	Line 1 cushion	QDC	Medium	4
17	End of Line 1	Hole in tube	Medium	4
18	Line 2	QDC	Small	2
19	Line 2	QDC	Small	2
20	line 2 Framing	QDC	Medium	3
21	line 2 Framing	QDC fitting	Medium	4
22	Line 6	Manifold	Medium	4
23	Line 6 upholstery	Hole in tube	Small	2
24	Line 6 upholstery	Hole in tube	Medium	8
25	Outside wall	QDC fitting	Small	1
			Estimated Total cfm	**66**

Air Compressor Controls

The two most effective ways to run air compressors are at "Full Load" and "Off."

The two reciprocating compressors are single-acting, air-cooled units with two-step unloading. This is an efficient compressed air unloading system. Reciprocating two-step unloading will efficiently translate the percentage reduction in air usage of "less air used" into nearly the same proportional reduction in energy cost. The current system has two-step controls on the 25 hp tank-mounted Champion compressor in Plant #5.

The two most common controls used for rotary screw compressors are **modulation** and **online/offline.** Modulation is relatively efficient at very high loads, but **is inefficient at lower loads.**

Online/offline controls are very efficient for loads below 60%, when properly applied with adequate time for blow down. There are several other control types — e.g., "variable displacement" (75% to 100% load) and "variable speed drive" (25% to 75% load) — that have very efficient turn down from when applied correctly. These controls must be installed correctly to operate efficiently. Piping and storage should be available close to the unit with no measurable pressure loss at full load to allow the signal to closely match the air requirements.

The current system has modulation controls on all the rotary screw compressors. They are currently applied at medium or low loads, and therefore, are relatively inefficient — particularly in Plants #1, #4, and #5. We recommend realignment as required. Adding increased demand may alleviate this. No action should be taken until after the new production loads are in place and the compressor control action can be reviewed at the new levels.

Building #1 System Assessment

Average system flow, in building #1, is 248 cfm at an average system pressure of 107 psig. Compressed air is supplied by two lubricated, rotary screw, air compressors using modulation/blowdown controls. The Sullair is a 150 horsepower machine rated for 690 acfm at full load and the Gardner Denver compressor is a 200 horsepower unit rated for 760 acfm at full load. Due to the low-load conditions, the Sullair compressor is running and the GD unit is off. Specific power is 2.32 cfm/kW and the energy costs are $19,774 per year.

The VanAir refrigerated air dryer is plugged into the wall and consuming energy but the unit has not been serviced in years and it is not doing any drying. The AirTek dryer is functioning well and is handling the low load conditions well.

TABLE 4. BUILDING #2 PLANNED DEMAND

CURRENT PRODUCTION	TOOLS	CURRENT PRODUCTION TOTAL AIR USAGE	PLANNED PRODUCTION ADDITIONAL TOOLS	PLANNED PRODUCTION TOTAL AIR USAGE
Framing	13	101 cfm total air usage. 101 cfm ÷ 33 tools = **3.1 cfm / tool**	3	Eleven additional tools @ 3.1 cfm each = **43 cfm** additional air required
Upholstering	20		8	

TABLE 5. BUILDING #2 COMPRESSED AIR LEAKS

NO	LOCATION	DESCRIPTION	EST SIZE	EST CFM
1	Pillow Stuffer	Lubricator	Small	2
2	Button Punch	Inside	Small	1
3	Tack Mach	Regulator	Small	1
4	Ottoman	QDC	Small	1
5	Ottoman	QDC	Small	1
6	Back Assy	QDC	Small	1
7	Back Assy	QDC	Small	1
8	Arm Upholstery	Foot pedal	Small	2
			Estimated Total cfm	**10**

THE SYSTEM ASSESSMENT

Furniture Factory Expands Production While Reducing Energy Costs

The impact of the future planned expansion, in plant #1, includes the addition of twenty-one (21) framing tools and fifty-six (56) upholstering tools. We established the increase in future compressed air demand at 400 cfm.

Demand-side air conservation efforts will reduce compressed air demand, in plant #1, from 248 cfm to 120 cfm. The demand-side efforts include air flow reductions from 66 cfm in identified compressed air leaks and 50 cfm in a new control system using receiver tanks and pressure/flow controllers.

The future compressed air demand, of 520 cfm, will be managed by either the Sullair or the Gardner Denver air compressor. Either one will operate much more efficiently, than today, with the higher percentage load. We do not recommend making any compressor control changes until the new air demand profile is verified and established. The Airtek dryer will likely be too small and a new cycling type refrigerated dryer may be required. Immediate actions recommended were to disconnect the non-functioning VanAir refrigerated air dryer and to implement the demand reduction projects.

TABLE 6. BUILDINGS #4 AND #5 PLANNED DEMAND

CURRENT PRODUCTION	TOOLS	CURRENT PRODUCTION TOTAL AIR USAGE	PLANNED PRODUCTION ADDITIONAL TOOLS	PLANNED PRODUCTION TOTAL AIR USAGE
Framing	55	352 cfm total air usage. Subtract sewing air 40 cfm = 312 cfm ÷ 156 tools = **2.26 cfm / tool**	27	Total additional tools @ 2.26 cfm each = **224 cfm** additional air required
Upholstering	101		72	
Sewing	24		0	

TABLE 7. BUILDING #4 COMPRESSED AIR LEAKS

NO	LOCATION	DESCRIPTION	EST SIZE	EST CFM
1	Line 9	Hole in hose	Small	2
2	Line 9	Hole in hose	Small	2
3	Line 3	Hole in hose	Small	2
4	Line 3	Hole in hose	Small	1
5	Line 4	Hole in hose	Small	2
6	Line 5	Hole in hose	Small	1
7	Line 5	Hole in hose	Small	2
8	Line 5	Fitting	Small	1
9	Line 6	Fitting	Small	1
10	Line 7	Fitting	Small	2
11	Line 7	Fitting	Small	1
12	Line 8	Fitting	Small	2
13	Line 8	Fitting	Small	1
14	Line 8	Hole in hose	Small	2
15	Line 8	Fitting	Small	1
16	Framing Dept	Hole in hose	Small	2
17	Framing Dept	Hole in hose	Medium	5
			Estimated Total cfm	**30**

Building #1 Compressed Air Demand Planning

Current Air Demand:	248 cfm
Demand Reduction Projects:	-128 cfm
Plant Expansion:	+400 cfm
Future Air Demand:	520 cfm

Building #2 System Assessment

Average system flow, in plant #2, is 101 cfm at an average system pressure of 101 psig. Compressed air is supplied by two lubricated, rotary screw, air compressors using modulation controls. Compressor #1 is a Sullair is a 40 horsepower machine rated for 150 acfm at full load and Compressor #2 is a Sullair 50 horsepower unit rated for 210 acfm at full load. Compressor #1 is running and #2

"The compressed air system assessment provides this furniture factory with a road map to be able to increase compressed air production from 701 cfm to 1,085 cfm — while reducing annual energy costs by $8,000."

— Hank van Ormer, Air Power USA

is OFF. Specific power is 3.2 cfm/kW and the energy costs are $5,692 per year.

The Ultrafilter refrigerated air dryer is broken and out of order. This explains the complaints about moisture in the compressed air system. The timer drain on the aftercooler separator is broken and leaking approximately 8 cfm.

The impact of the future planned expansion, in plant #2, includes the addition of three (3) framing tools and eight (8) upholstering tools. We established the increase in future compressed air demand at 43 cfm.

Demand-side air conservation efforts will reduce compressed air demand, in plant #2, from 101 cfm to 65 cfm. The demand-side efforts include air flow reductions of 10 cfm in identified compressed air leaks and 13 cfm in a new flow-control system using receiver tanks and pressure/flow controllers.

The future compressed air demand, of 108 cfm, will be managed by either one of the Sullair rotary screw air compressors. Both will operate much more efficiently, than today, with the higher percentage load. We do not recommend making any compressor control changes until the new air demand profile is verified and established. Immediate actions recommended were to replace the Ultrafilter dryer with a new cycling-type refrigerated dryer, replace the timed solenoid drain with a no air-loss demand drain, and to implement the demand reduction projects.

Building #2 Compressed Air Demand Planning

Current Air Demand:	101 cfm
Demand Reduction Projects:	- 36 cfm
Plant Expansion:	+ 43 cfm
Future Air Demand:	108 cfm

Buildings #4 and #5 System Assessment

The recommendation of this system analysis is to create one supply-side system to supply Buildings #4 and #5.

Average system flow, in building #4, is 244 cfm at an average system pressure of 119 psig. Compressed air is supplied by three lubricated, rotary screw, air compressors using modulation controls. Compressor #1

THE SYSTEM ASSESSMENT

Furniture Factory Expands Production While Reducing Energy Costs

TABLE 8. BUILDING #5 COMPRESSED AIR LEAKS				
NO	LOCATION	DESCRIPTION	EST SIZE	EST CFM
1	Rocker Assy	Tubing	Medium	5
2	By Band Saw	QDC	Small	1
3	Pillow Fill	Fitting	Small	1
4	Line 10	Holes in Hose	Small	3
			Estimated Total cfm	**10**

is a 100 horsepower Palatek machine rated for 420 acfm. Compressor #2 is a 50 horsepower Sullair machine rated for 210 acfm at full load and Compressor #3 is a Sullair 40 horsepower unit rated for 150 acfm at full load. Compressor #1 is running at part load compressors #2 and #3 are OFF. Specific power is 3.59 cfm/kW and the energy costs are $12,026 per year.

The Deltech refrigerated air dryer, in building #4, has a 35 psid pressure loss due to a fouled pre-cooler. This is a larger dryer rated for 1000 cfm and no maintenance has been performed on the unit in years. The Arrow dryer is functioning properly.

Building #5 has an average system flow of 108 cfm at an average system pressure of 105 psig. A Sullair 75 horsepower rotary screw compressor is supplying the system using modulation controls. There is a Champion 25 horsepower reciprocating air compressor acting as a back-up. This machine is OFF.

The impact of the future planned expansion, in building #4 and #5, includes the addition of twenty-seven (27) framing tools and seventy-two (72) upholstering tools. We established the increase in future compressed air demand at 224 cfm.

Demand-side air conservation efforts will reduce compressed air demand, in buildings #4 and #5, from 352 cfm to 233 cfm. The demand-side efforts include air flow reductions of 40 cfm in identified compressed air leaks

and 55 cfm in a new flow-control system using receiver tanks and pressure/flow controllers.

The future compressed air demand, of 457 cfm, will be managed by the 100 horsepower Palatek rotary screw air compressor. The Champion 25 horsepower reciprocating compressor with two-step controls can supplement the demand running flat out. This compressor, however, may eventually be replaced by the Sullair 40 hp machine.

Buildings #4 and #5 Compressed Air Demand Planning

Current Air Demand:	352 cfm
Demand Reduction Projects:	- 119 cfm
Plant Expansion:	+ 224 cfm
Future Air Demand:	457 cfm

TABLE 9. KEY AIR SYSTEM CHARACTERISTICS — FUTURE SYSTEM*

Measure	BUILDING 1	BUILDING 2	BUILDINGS 4 & 5	TOTAL
Average System Flow	520 cfm	108 cfm	457 cfm	1,085
Avg Compressor Discharge Pressure	95 psig	95 psig	95 psig	95 psig
Average System Pressure	90 psig	90 psig	90 psig	90 psig
Input Electric Power	122.6 kW	31.2 kW	92 kW	245.8 kW
Specific Power	4.24 cfm/kW	3.46 cfm/kW	4.97 cfm/kW	4.41 cfm/kW
Ann'l Elec Cost for Compressed Air	$22,656 /year	$5,766 /year	$11,002 /year	$39,424 /year

*Based on a blended electric rate of $0.077 per kWh and 2400 operating hours per year.

Conclusion

The compressed air system assessment provides this furniture factory with a road map to be able to increase compressed air production from 701 cfm to 1,085 cfm — while reducing annual energy costs by $8,000. The key to this project was to find ways to best use the existing equipment while also implementing demand-reduction projects. BP

Contact Hank van Ormer; tel: 740-862-4112, email: hankvanormer@aol.com, www.airpowerusainc.com

To read more ***System Assessment*** articles, visit www.airbestpractices.com/system-assessments

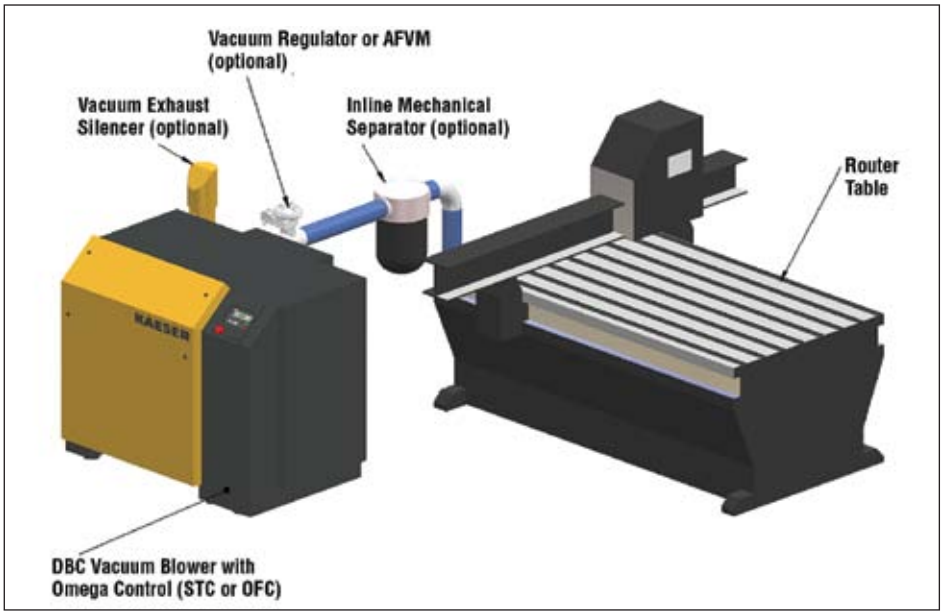
Furniture Maker Goes with **Tri-Lobe Blowers**

By Michael Camber, Kaeser Compressors

A large custom leather furniture manufacturer switches from rotary screw vacuum pumps to blowers for CNC router table hold down, and saves big on electricity, maintenance expenses and floor space.

In many US furniture and other wood product plants, CNC router tables are commonly used to achieve an optimal combination of productivity and customization. They rely on vacuum to hold work pieces in place as shapes are cut out by the router. This is vital for precision and consistent product quality.

The CNC machine OEMs and dealers often sell vacuum units with the router tables. There are many types, including liquid ring, piston pumps, rotary vane, lubricated rotary screw, dry screw and various types of blowers. Blowers are less often sold with original equipment because they are generally limited in the depth of vacuum they can reach. Positive displacement blowers, for example, don't usually go beyond 15"Hg, and regenerative blowers even less. It is commonly believed that vacuum levels of 25–29"Hq are needed to properly hold down work pieces.



CNC router tables with a 3 psi rated DB Series Blower

Another reason blowers are less commonly sold as part of the OEM package is that not all blower makers and sellers offer complete packages. Blowers require additional components (e.g. motors, drives, inlet/out silencers, and controls) and engineering to integrate them. Rotary screws, vanes and liquid ring pumps are commonly sold as complete packages with no need for further engineering. Further, many blowers are louder than these other devices, making them less desirable.

The Case

The US furniture manufacturer in this case purchased their first router in the early 2000s, and they now operate a total of four router tables. With each table, they purchased 40 hp rotary screw vacuum pumps selected to provide approximately 27" Hg vacuum. Over the course of several years, their processes seemed to require increasing amounts of vacuum. At this time, Kaeser suggested blowers as an alternative, but they were believed inadequate due to their vacuum level limitations. The conventional wisdom was that vacuum level was more important than flow. So based on outside recommendations and observations from another plant, they added two 100 hp vacuum screws and took one 40 hp unit offline. By the end of 2007, they operated 5 machines (from two different manufacturers) totaling 320 hp.

But they continued to have difficulties. Once significant portions of the plywood sheets were cut away, the sheets themselves would begin to move because of the force of the cutting head on the sheet goods — creating downtime, inaccurate cuts and excessive scrap material. A set of four hydraulic roller bars were even put in place at each table to help keep the sheets in place, but the problems continued. Further, these sets required substantial annual maintenance.

In addition, the plant's ambient conditions were tough on the vacuum screw units. Though the units were fitted with special inlet filtration, the heavy load of wood dust and leather fibers on the inlet filters caused them to fail and collapse. After review of the system, it was determined that undersized interconnecting piping on some of the vacuum units was a root cause. Changing the piping from 4" to 6" slowed the air velocity

The Kaeser Com-paK Plus™ DB Series blowers have a reduced footprint and provide capacities up to 812 cfm at 3 psig.

FURNITURE MAKER GOES WITH TRI-LOBE BLOWERS

down enough so the inline filters could do their job of stopping sawdust from making its way into the airend.

Several of the vacuum screw airends had to be replaced due to contamination. Maintenance and repair on these units (air filters, oil filters, air/oil separators, and replacement airends) added up to tens of thousands of dollars in maintenance cost per year. After five years of trying to make it work with vacuum screws, the manufacturer was ready for a change. Sales representatives from Kaeser Compressors made the case that in fact it is air flow that provides stability in these applications — not deeper vacuum. This was a tough sell with the plant manager. So Kaeser suggested they try using a blower on one table.

Rethinking The Basic Idea

The common wisdom is to go with deeper vacuum with the idea that greater force is being applied to hold the wood in place on the table. This is true at each small hole in the table, but the total hold down force is a function of pressure/vacuum and area. There are many, many vacuum holes on each table, and effective vacuum can often be achieved using less vacuum with higher flow rates. While it is true that the vacuum is the force which holds the work piece in place, more and more flow is required as the material is cut away and more holes in the table are exposed. Once the flow requirement of the process is greater than the capacity of the vacuum pump, the vacuum degrades and the work pieces slip. Contrary to the belief that it is the depth of vacuum providing hold down on routers, the solution to the problem is a vacuum pump designed to produce more flow.

Implementing The New Solution

In the Spring of 2011, the manufacturer installed one 30 hp Kaeser Omega DB 236 blower package as a test to supply vacuum for one router table. This unit was furnished

> "The rotary lobe blower packages also require less routine maintenance and are less sensitive to the ambient conditions. The plant manager estimates the maintenance savings at almost $25,000 per year."
>
> — Michael Camber, Kaeser Compressors

with external STC option for reduced current starting and controls. This model put out 642 cfm. Vacuum level ranges from 11 to 9"Hg depending on the phase of routing. It replaced a 40 hp screw machine producing 555 cfm at 24"Hg. The complete blower package required approximately half the floor space of the unit it replaced. After nearly a year of reliable performance, they purchased three additional DB 236 C blower packages for the other three tables. This time, the plant opted to purchase fully-integrated models with the starter and controls built in. This made the installation faster and the total footprint reduction was even greater when the 100 hp screw units were removed.

Cost Savings

Blowers can generate much greater flows with smaller motors (and electricity). The high flows compensate for the shallower vacuum levels. In addition to the energy savings, they are simpler devices and cost less to maintain.

By installing a lower horsepower blower, there were significant energy savings. Prior to the blower installations, the manufacturer was using over 320 hp, and is now using only 120 hp. Calculations based on approximately 5,000 operating hours per year reduce their power costs from just over $119,000 to less than $45,000 — savings of $74,000 annually.

The rotary lobe blower packages also require less routine maintenance and are less sensitive to the ambient conditions. The plant manager estimates the maintenance savings at almost $25,000 per year. Further, the hydraulic rollers were no longer needed, which reduced maintenance costs even further.

The simple ROI on this project was 10 months. BP

For more information contact Michael Camber, Marketing Services Manager, Kaeser Compressors, michael.camber@kaeser.com, 540-898-5500, www.kaeser.com

To read more ***Blower*** articles, visit www.airbestpractices.com/technology/blowers

The Art of Air-End Forensics

By Lee Levisay, The PROS Company

When you send your air-end to a company to have it rebuilt, do you get a piece of paper with no more information on it than what it is going to cost to rebuild or do you get a full technical evaluation, complete with photos, showing the damage inside your air-end and explaining what needs to be done regarding repair? There is a company out there that is now giving you this choice. The PROfessionals at The PROS Company out of Lubbock, Texas, does a full technical evaluation on every air-end reconditioned. They will furnish you photos and give an explanation of the damage and what will need to be repaired.

Clues Explain Root Causes

The art of air-end forensics is actually more of a science than an art. It takes years of experience and knowledge of the interworking of air ends to be accurate. Air ends do not have a lot of pieces, but the pieces they do have are specialized and rotate at high speeds with close tolerances. When the smallest thing goes wrong, you can have a major problem. There are always clues to what went wrong. Putting all the clues together and presenting the results in a technical evaluation is most important to being able to make an informed decision on whether to rebuild an air end or to replace it.

It is always interesting to see what you will find inside of an air end when you disassemble it. Looking for clues and taking photos is vital for a good forensic report. A small scratch or discoloration of metal could tell you the story about the history of the air end. Sometimes it takes further analysis with a microscope to tell the full story. We once had an air end and the bearings showed the classic pattern of electrical arcing as the cause of the failure. We decided to send the bearings to the manufacturer for further analysis. The manufacturer did microscopic analysis on them and found two different solid particle contaminates in the bearing causing the visible damage. This completely changed the results of the technical evaluation and showed that external contamination was the real culprit. To the right is the conclusion to the report from the bearing manufacturer.

Bearing Report Conclusions

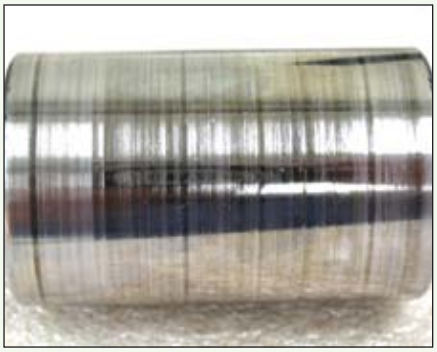
No evidence of electrical arcing appears in or on these bearings. Indentations on the raceways may have been mistaken for arcing damage. Another feature that could be misconstrued as arcing damage is small galled patches on the mated side faces of the two outer rings. Solid particle contamination and related damage could account for the excessive vibrations from the equipment, but the source of vibration may be unrelated to the bearings.

Both bearings display evidence of solid particle contamination. Dents and scratches are present in the load zones of both rings. Some of the dents are smooth bottomed, while others exhibit rough bottoms. These conditions indicate that some of the particles had ductility but others exhibited brittle behavior. Damage to the rolling elements also supports the presence of solid particles in the bearings. The balls are scratched and the rollers exhibit scoring and pronounced grooves. The scoring and grooves on the rollers are typically due to particles that are forced through or become lodged in the cage pockets. Several of the cage ribs do have embedded metal particles. Since there is no spalling in these bearings and neither cage is broken or excessively worn, the source of the particles must lie outside the bearing.

A few small galled patches are present on one side face of each outer ring. Galling is an adhesive wear mechanism that causes material to be pulled from one surface and deposited on the other as one surface moves relative to the other. The appearance can be misinterpreted as arcing damage. The galling damage features on the faces of these two rings are mirror images of each other. This and the outline of notches on the cylindrical roller bearings side face establishes that the bearings were mounted against one another.

Damage mistaken as electrical arcing.

Scratches on bearing.



Scratches on roller bearing.

With Reports Like This, The Full Story Is Told

Other not so common problems are chemical corrosion issues. Some air-ends we have reconditioned have evidence of chemical corrosion from the environment they are exposed to. The damage is more of a pitting and flaking on the bearings then scratching and scuffing.

The meshing of the rotors is another place where very tight tolerances are of great importance. If external contamination enters the air end, there is a high possibility that there will be damage to the rotors. Scarring, pitting, and normal wear of the rotors will make the air end less efficient. Excessive damage to the rotors will turn them into scrap iron. New sealing strips can be put on rotors, but damage to the rotor profile is less likely to be repairable. In conjunction with damage to the rotors is normally damage to the housing. With the advancement in welding procedures, most housings are repairable. A good technical evaluation will have detailed photos and descriptions of the damage and what needs to be repaired.

With air compression and rotating parts, heat is generated and is a constant companion. The oil-flooded air end uses the oil to help control the heat and remove it from the air end. When this balance is upset and heat builds up in the air end, damage will occur. The excess heat will cause thermal expansion of the rotors. The rotors will then start to rub the housing in many different places. Most common is the air gap, the discharge face and the interior of the rotor housing.

THE ART OF AIR-END FORENSICS

Chemical corrosion evidence on the bearings.

Liquid metal evidence of chemical corrosion.

Corrosion on the bearing and bearing race.

When doing the forensics, excessive heat leaves many different clues. Burnt oil residue looks like molasses and will be in every nook and cranny not scraped off by moving parts. As the rotors continue to heat up and expand, they will come into contact with the housing. This will create more heat buildup and damage.

Then there will be evidence of metal parts scraping against each other. If the air end is not shut down, the heat will build with more thermal expansion of the housing and rotor, thus eliminating any close tolerances that were there. The metal will liquefy and when the unit does finally stop rotating, the liquefied metal will weld the rotor and housing together, locking the unit up and resulting in a catastrophic failure. Forensic evidence is really obvious at this point. The air end rotor will then have to be surgically removed with a custom-made saw and our oversized drill press. If the inexperienced rebuilder tries

to press the rotor out of the housing, he/she will break the housing and make the air end owner buy a new one.

Sometimes what is not there is just as important as what is there. We have found missing parts that a previous rebuilder forgot to install or maybe thought was not important. Most common are spacers and seals. We find multiple shims installed instead of making a spacer. The most comical was a combination of washers and shims (not all the same sizes) that replaced a spacer that was almost 3/8 of an inch in thickness.

An effective manager will take the information provided from the technical evaluation and use it to prevent similar problems or to improve on the preventative maintenance program. One customer keeps a file on each air end and will put the technical evaluation in the file each time it is rebuilt to compile a more complete history.

Here is an actual response from a customer on the technical evaluation and resulting quotation — "Another VERY good analysis. We can sell & justify this kinda work every time! Get er' dun! Thx!!!". It makes your job much easier to justify to other managers or customers if you are able to fully inform them when the time comes for approval to spend money that may have been budgeted for something else. A well-written technical evaluation with good forensic data is a valuable tool to have in your toolbox.

Damaged rotors.

Damaged rotor housing.

Burnt oil on bearing.

Burnt oil residue in oil port.

In summary a well-prepared technical evaluation will have lots of photos of the forensic evidence and good descriptions of the damage. With this information, the decision maker is much more informed to make the best economical choice for the company. The technical evaluation is a tool that will create a win-win situation for all involved. BP

For more information please contact Lee Levisay, The PROS Company, tel: 405-830-0776, email: lee@thePROSco.com, www.thePROSco.com

To read more ***Technology*** articles, visit www.airbestpractices.com/technology/air-compressors

"An effective manager will take the information provided from the technical evaluation and use it to prevent similar problems or to improve on the preventative maintenance program."

— Lee Levisay, The PROS Company

Association of Independent Compressor Distributors (AICD) Membership Meeting & Exhibition 2012

By Rod Smith, Compressed Air Best Practices® Magazine

AICD Members in Attendance:

Advanced Air & Vacuum
Air Equipment Sales & Service
Bi-State Compressor
Brehob Corporation
Burton Compressor
Comp-Air Service
Compressed Air Power
Compressed Air Solutions
John Henry Foster of Minnesota
A.J. Kollmyer & Son
Maddox Air Compressor
Maine Air Power
McGee Company
Michigan Air Solutions
National Pump & Compressor
Q-Air California
Reapair Compressor Service
C.H. Reed
Rogers Machinery
Scales Industrial Technologies
Stansbury Equipment
Starr and Company

The 2012 edition of the AICD was held May 20-22 at the Rosen Shingle Creek Resort in Orlando, Florida. Located near the convention center, what struck me was how large it was — yet it maintained a very high level of service and quality. "High value" is the word I think of. Value, of course, is also a term that we "compressed air people" believe in!

Attendance levels, at the Conference, were excellent by both exhibitors and the membership of the association. The AICD President, Manny Cafiero of Scales Industrial Technologies, said, "The AICD continues to deliver high value to both our members and to our vendors who make this meeting possible."

AICD President, Manny Cafiero and AICD Administrator Cheryl Kiker visiting with Mike Wlodarski and Keith Beatty at the Hydrothrift booth.

The Conference

The speaker line-up delivered on President Manny Cafiero's promise to be "deliver high-value to both association members and vendors." All conference sessions were open for vendors to attend — something I know the vendors appreciate. The first presentation was titled "The Economy and Small Business" presented by Dr. Carol Dole from Jacksonville University. The presentation provided an overview of which metrics she believes small businesses should monitor, a review of the current growth in the manufacturing sector, and comments on the growing federal debt and how it compares with the debt levels of other countries.

Mr. Bob Currie, from Currie Management Consultants, was the keynote speaker and he conducted a workshop during most of the first day. The workshop was designed to help executives running compressed air distributorships. Armed with over thirty years of experience providing management consulting to machinery distributors and OEM's, Mr. Currie impressed me with the depth of Mr. Currie's experience in the compressed air industry. He was able to provide interesting ratios of aftermarket to capital equipment sales — and how they have changed over the past twenty years. These baseline financial ratios can serve managers well as they debate on whether or not to make investments in certain

Steve Kollmyer, Camilo Villalobos, Charles Pugh, and Nitin Shanbhag at the Hitachi America booth (left to right).

Lisa Vice, Charles Pugh, Jim Bruce, Pam Tetterton, Jim Tomczyk, Steve Houtz, Brad Reed, Dennis Reed, and Bill Thomas (left to right) discuss BEKO compressed air measurement, treatment and condensate management products.

THE 2012 AICD MEMBERSHIP MEETING & EXHIBITION

Roger Michael, Bill Scales, Lillian Fiore, and Ray Brahm at the SPX Hankison booth.

Eugene White, Diane White, and Tarah White at the JORC booth.

areas of their businesses. What kind of asset utilization does your firm have on new units? What is the average gross profit contribution your sales people should contribute each month? Do you have a "Customer Satisfaction Index" and where should you rate? These are a just a few of the things Mr. Currie discussed.

Mr. Harris Rosen, the President and COO of our host Rosen Hotels, came to speak with us and provided us his "only in America" entrepreneurial success story. The son of Russian immigrants who raised him in New York City, Mr. Rosen told us his inspirational story. Every job he received in the hotel industry, he viewed as an opportunity. He started at the very lowest levels — but excelled at them because he knew it could lead to the next level. It invariably did. A war veteran and college graduate willing to "get his hands dirty", Mr. Rosen's story is what "the American dream" is all about. He started with absolutely nothing, was willing to dream big and then worked harder than any one else. He even hitch-hiked to New York City to recruit tourist customers to his first hotel in Orlando. Many people helped him along the way by opening the door a crack for him. Mr. Rosen then blew the door wide open benefitting all who helped him. We can all learn so many things from his story.

Other excellent presentations were made by Mr. Bill Scales, CEO of Scales Industrial Technologies, who spoke about "The Future of Distribution" and by Mr. Pat Johns, of PFJ Communications, made a presentation titled, "The Power of 5 Footprints."

The Exposition

At the exposition, I normally disappear from my booth and don my "roving reporter" hat.

I wander around wielding my low-budget digital camera and get into interesting conversations during the exhibition. Here is a summary. My apologies go to the many booths and firms not mentioned due to the space limitations of the article.

HITACHI America has in a short period of time, become a part of the compressed air market in the U.S. Senior Manager, Nitin Shanbhag, reports they are moving into a larger facility in the Charlotte area to support their growing business. The current initiative, at Hitachi, is a campaign to sign up oil-less scroll air compressor distributors. The range runs from 1.5 to 16.5 kW. More info at www.hitachi-america.us/airtech.

BEKO Technologies is seeing significant growth in their refrigerated air dryer business since acquiring Belair. Bill Thomas and the team at BEKO report significant gains have been made in market share and that the business is in great shape. Steve Houtz, BEKO Southeastern Regional Manager, told me an interesting story of the success they are having with their MetPoint® measurement product lines. One of his distributors has successfully installed eight flow meters in the piping network of a steel plant. This allows the plant to charge each production area for the exact use of compressed air that they realize. This monthly compressed air bill has led the customer's production areas to get more interested in reducing the energy costs! BEKO also has new flanged filters for 4" to 12" diameter pressure vessels for flows to 12,000 scfm and announced the redesigned Qwik-pure® 100 oil-water separator. More info at www.bekousa.com.

Hankison SPX was excited to talk about their new refrigerated dryers designed for high-

Dale Zimmerman, Ted Silva, Jane Sexton, and Jim McFadden at the Parker Finite and Airtek Filtration booth.

Tim Deal, Steve Kwiatkowski, and Herb Schupp at the Parker Legris booth.

FREE SUBSCRIPTION

DIGITAL EDITION FREE WORLDWIDE | PRINT EDITION FREE TO U.S. SUBSCRIBERS

COMPRESSED AIR
BEST PRACTICES
airbestpractices.com

Join Us On The Road To Saving Energy & Improving Productivity In YOUR Industry!

2012 FOCUS INDUSTRIES:

- Beverage Bottling
- Plastics
- Food Packaging & Containers
- Chemical & Powders
- System Assessments
- Woodworking/Building Materials
- Compressed Air System Automation
- Wastewater Treatment
- Food Processing
- Automotive
- Air Compressor Controls

Subscribe at **airbestpractices.com**

International pricing for print edition — $65 in Canada and $95 for other countries.

THE 2012 AICD MEMBERSHIP MEETING & EXHIBITION

flow applications. Sales Manager, Ray Brahm, says the company has sold their first multi-station design HES Series refrigerated dryer. This line extension of the HES Series is for air flows ranging from 3,750 to 12,500 scfm (6.371 to 21.338 m^3/h) and uses modular construction of modules configured for 1,250 scfm and 2,500 scfm. More info at www.hankisonintl.com.

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. I have always particularly liked their Air-Saver lock-down valves to prevent air leaks when the system is down during shut-down periods. I liked Eugene's comment to me best of all though of, "We don't sell drains, we sell service!" More info at www.jorc.com.

Aircom USA — based out of the Charlotte area in North Carolina. Industry veteran Hal Burke reports that the market acceptance of their aluminum pipe product line has been "very strong". They have recently expanded the line from 1½" (40 mm) up to 4" (110 mm) pipe diameters. More info at www.aircom.us.com.

Parker's Finite Airtek Filtration Division remains the reigning champion with the most entertaining booth. There are always screaming women at their craps table complete with a tuxedo-clad dealer! Ted Silva showed me their thermal mass refrigerated dryer that has a standard pressure drop of only 2 psig and is rated for air flows of 200 to 1,000 scfm. An innovation that caught my eye is the Parker Finite T-Series top-loading filter. Ideal for OEM applications like refrigerated dryers or anywhere that space is an issue,

Barry Schoenborn, at the Thermal Transfer Products booth, announced special discount level for all Association members.

Nick Herrig, Colin Billiet, Dennis Reed, David Peters, and Tony Hergert at the Nano Purification Solutions booth.

THE 2012 AICD MEMBERSHIP MEETING & EXHIBITION

Joe Burke and Hal Burke at the AIRCOM USA booth.

the filter is designed so you can change the filter element without needing the clearance of the bowl. They currently have one housing size with ¾" and 1" ports. More info at www.parker.com/pdf.

Barry Schoenborn, at the Thermal Transfer Products booth, announced their new "Compressor Distributor Partner Program." This program provides "best customer" discount levels and a presence on their web site's distributor locator for members of all valid distributor associations including the AICD, ICDA, NAACD, and ACIDA. More info at www.legris.com.

Parker Legris commented that their new 6" (168 mm) diameter aluminum pipe is selling very well and providing excellent "pull-through" for the rest of the system. www.legris.com

Nano Purification Solutions has, in a very short time, assembled a very experienced group of compressed air veterans and is entering the market with some interesting technologies. Their new D-Series desiccant dryers have a patented combined filter and desiccant cartridge allowing users to eliminate external pre- and after-filters (although they do recommend an oil coalescer prefilter if the compressor is lubricated). The company is also introducing a new line of Sepura Sterling oil-water separators. What caught my attention is that there is no carbon material-the filter media is made from recycled materials. The unit has several unique features including no settling tank which saves installation space. www.n-psi.com

Since I'm obsessed with demand-reduction projects, I have to mention Roger Schmitt and Howard Kielar who are now working for Pfannenberg. At their booth they had a nice display of the cabinet cooling solutions that Pfannenberg offers — which are of course more efficient than using compressed air.

Conclusion

Once again the AICD was a very entertaining and educational event. For anyone wanting more information on the AICD, please contact Cheryl Kiker at aicd@aicd.org or visit www.aicd.org. BP

To read more ***Industry News*** articles, visit www.airbestpractices.com

"The new 6" (168 mm) diameter aluminum pipe, from Parker Legris, is selling very well."

— Rod Smith, Compressed Air Best Practices® Magazine

POWER TRANSMISSON AND CONTROL 2012

Oct 29–Nov 1

Shanghai New International Expo Centre,
Shanghai, China

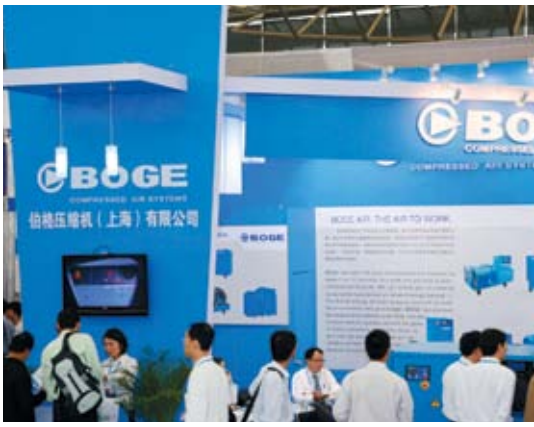
Certified by

U.S. COMMERCIAL SERVICE
United States of America
Department of Commerce

Asia's Premier Event for Compressed Air & Vacuum Technology

PTC
MDA

ASIA



2011 Statistics

- **56,525** qualified buyers from over 81 countries
- **1,499** exhibitors
- **1 million** sq ft display area

Full-Time and Real-Time Global Marketing Coverage

- By **over 20** industrial and public media portals
- By **over 50** logistics industry media platforms
- By **over 100** user industry media publications
- By **over 20** user industry organizations

Your participation at PTC ASIA will be reported in 72 countries and regions across the globe!

www.ptc-asia.com

For more information, please contact Aryan Zandieh at (312) 924-1688 or azandieh@hfusa.com

2011 Exhibitors

Compressed Art Technology

AtlasCopco, IngersollRand, Fusheng, SULLAIR, Kaeser, GardnerDenver, Compair, Quincy, MATTEI, Shinko, Boge, WoyoSuperdo, Hanbell, Kaishan, UnionTech, Screw, Feihe, GHH RAND, ROTORCOMP, AERZEN, TMC, ELGI, Donaldson, Mann+Hummel, Sotras, Fuma, Airfilter, ALUP, BEKO, RENNER, Hoerbiger, ODE, Dynamic, Anderol, etc.

Product Categories

Compressed air technology

- Compressors for compressed air production
- Compressor accessories and components
- Vacuum technology

Deutsche Messe
Worldwide

Hannover Fairs USA, Inc.

How Efficient Are Those Pneumatic Valves?

By Richard F. Bullers, SMC Corporation of America

Back when gasoline was 35 cents a gallon, the term "environmental technology" was not well known. Engineers did not often promote the benefits of building low-energy consumption pneumatic valves among their peers. Recycling or conservation of resources was seldom discussed with any seriousness. In reality, the conversation was more likely to have turned to the muscle cars of the day and how much horsepower they would generate.

This "bigger-is-better" philosophy not only produced big block engines with three carburetors, but also pneumatic valves with large direct solenoids and bulky steel construction. Then one day some of us woke up to find out the meaning of an Arab Oil Embargo. Suddenly the thought that our energy supply was cheap, plentiful, and secure evaporated.

A typical pneumatic solenoid valve of that era may have consumed 6 Watts of power and lasted 10 million cycles. Today a pneumatic valve can be operated with power consumption as low as 0.1 Watt with a life of over 200 million cycles. This is an amazing 60 times less energy with 20 times the life. How is this now possible?

The Transition To Modern Valve Design

One technique that dramatically lowered the energy consumption of a pneumatic valve was using the concept of flow amplification. A very small 3-port, 2-position, direct-solenoid valve is used to operate a much larger air-operated valve. The small solenoid results in low power consumption (Fig. 1).

At the heart of this transformation is the development of advanced design direct solenoid valves that are diminutive in both size and power consumption.

The solenoid pilot valves have also undergone specific design changes to improve their performance and use less energy. As valve design evolved, materials changed from zinc die cast to anodized aluminum, to engineering plastics. This has resulted in valves with streamlined shapes and lower mass. The internal passages, spool and sleeves, and poppet designs changed to increase flow capacity.

The advent of serial communications systems that use coded signals to operate individual solenoids on banks of valves mounted together on a common manifold has eliminated cumbersome wiring harnesses and improved electrical efficiency. Now entire networks of valves can be controlled, monitored, and programmed from a remote location.

As industrial automation produces ever more sophisticated machines with the advance of robotics, benefits of weight reduction and power conservation in pneumatic valve design are beginning to find their role in a larger strategy of environmental technology.

Optimizing solenoid valve design may seem a trifle affair when compared to reducing gasoline consumption for an automobile, but every unnecessary ounce of material and unit of energy expended have a collective and negative impact. The vast majority of energy used to manufacture and operate virtually every modern object we use every day is electricity generated from coal.

The Transferable Benefits Of Energy Conservation

There are over 600 coal-fired electricity plants operating in the United States today. A typical 500-megawatt coal plant will discharge 10,000 tons of sulfur dioxide; 10,200 tons of nitrogen oxide; 720 tons of carbon monoxide; 125,000 tons of ash; and 3,700,000 tons of carbon dioxide in addition to tons of other disagreeable waste products.[1]

We don't need an alarmist to remind us we do not want ourselves or our children breathing pollution, but this issue is often as invisible as the air. It's not just asking about what we can change over the next decade, but how our very next decision in regards to purchasing and applying pneumatic valves can work to both our immediate and long term advantage.

The long-term benefits of reducing energy consumption are the short-term rewards that can be realized by machine builders, maintenance personnel, plant managers, or anyone applying pneumatic valves.

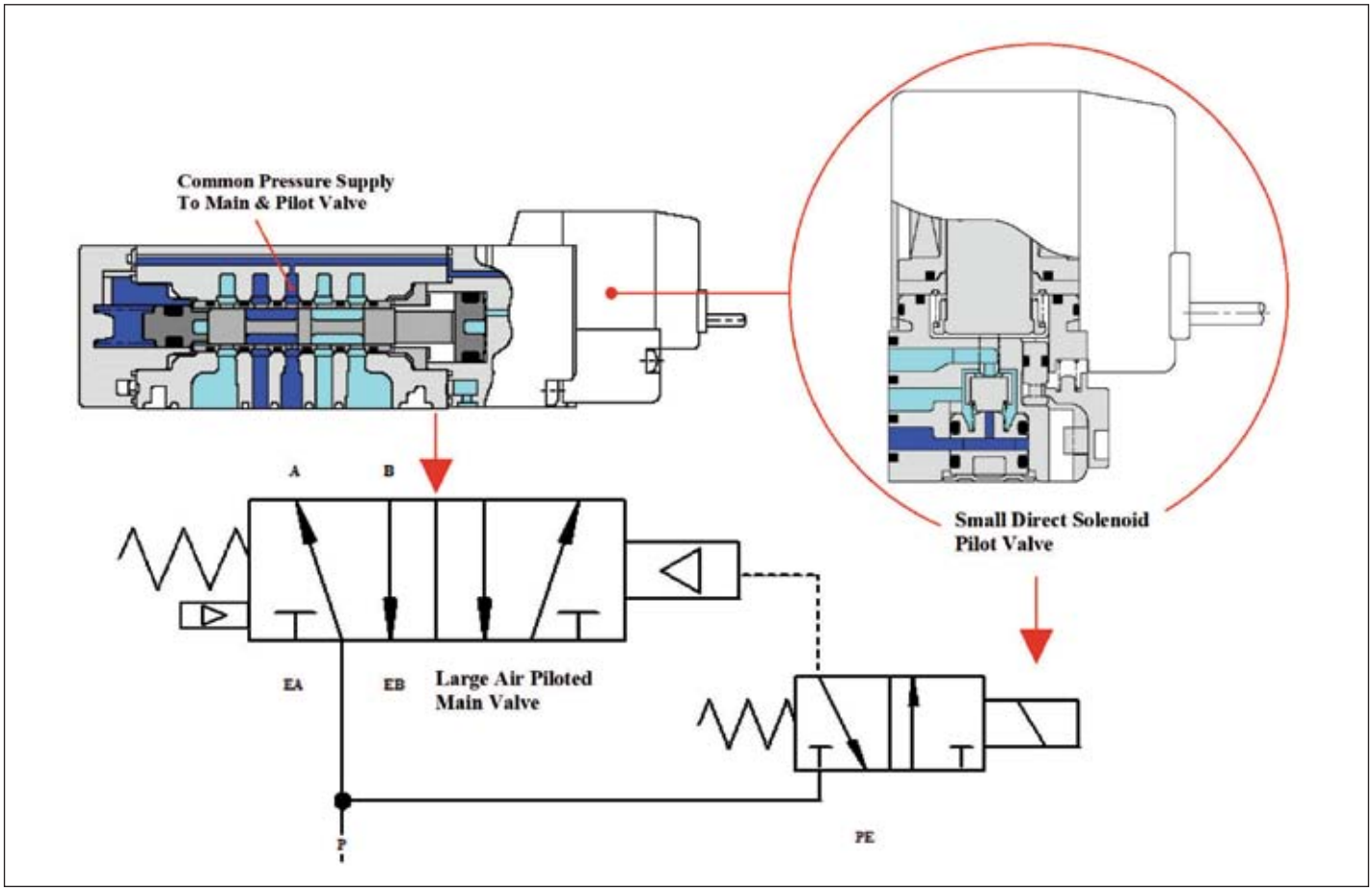


Fig.1 Power Amplification The Solenoid / Pilot Valve

HOW EFFICIENT ARE THOSE PNEUMATIC VALVES?

The most immediate profit for end users is from a reduction in electricity consumption, but for everyone there is a strategic advantage gained from the "transferable benefit" created.

Transferable benefits are gains you make that can be passed along to your customers, shareholders, employees, or anyone in general. It is a reduced cost, a "green machine," a reputation as an environmentally conscious company that can boost a bottom line, beat a competitor machine's operating costs, or gain business from public awareness.

Imagine competing on a reduction in operating costs by positioning yourself as an energy efficiency leader in your industry.

In conclusion you might wonder; how much coal does that valve burn? Twenty times, thirty times, sixty times more then it needs to? Look at the valves you have in service, compare your energy costs, and explore your alternatives. An epiphany can not only be enlightening, but also profitable.

Practical Techniques For Energy Savings

How can cost savings from the application of pneumatic valves be achieved?

1 Apply Energy-Efficient Pneumatic Valves Whenever Possible

Where previously a valve may have used 6 Watts to operate, the same valve now could be operated for a 10th of a Watt. This is an amazing 60 times less energy use. Not all applications can reduce their energy consumption by this amount, however significant gains can be made with a modest amount of effort.

The replacement of old energy-inefficient pneumatic valves can be done as part of a major overhaul or simply as a replace-as-needed strategy. This also provides several opportunities. One is to check the valve to ensure it is not oversized. Another is to conduct an energy audit.

Energy audits are an effective tool in identifying waste and making a plan for corrective action. According to Hank van Ormer, Air Power USA, Inc., "Compressed air conservation and optimization programs in any compressed air system will generate significant energy savings opportunities, plus probable improvement in productivity and quality.[2]

You've been changing to energy-efficient light bulbs in your house, so why wouldn't you change the same old valves you've been using all these years? Check the power consumption of any valve product you have in service and ask if there is another way of doing the same job with less energy. When purchasing a valve, ensure the flow capacity and valve function are correct and make it a "trifecta" by getting the lowest wattage valve possible.

2 Shop For Energy-Efficient Machines

What do you do when you buy a water heater, stove, refrigerator, air conditioner, furnace, or virtually any other appliance? You look at the Energy Star[3] rating, of course. Ask the machine builder to explain what the power consumption of their machine is and how their product was designed with energy savings in mind.

If you are contracting with a machine builder, make low power consumption one of the stated design goals. Ask them for a return on investment analysis for operating costs versus machine purchase price. This will provide incentives for manufacturing a machine that will pay for itself in a reasonable amount of time and help you determine if the price is right.

3 Build Energy-Efficient Machines

For a machine build, this sounds like a naïve statement, but in reality it is simply a matter of using a straightforward approach, technical challenges notwithstanding. The lines are not always clearly drawn between practicality, manufacturing costs, or competitive advantage, however there are basic techniques that can be applied.

Always consider a mechanical advantage.

The amount of motive power necessary to do any task can be greatly reduced by the use of gears, levers, springs, and other practical

1 Union of Concerned Scientists: Webpage, *How Coal Works*

2 Fluid Power Journal 2010 System Integrators Directory *The Many Faces of a Compressed Air Audit*

3 ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy. More information is available at: www.energystar.gov

"Where previously a valve may have used 6 Watts to operate, the same valve now could be operated for a 10th of a Watt. This is an amazing 60 times less energy use."

— Richard F. Bullers, SMC Corporation of America

mechanical devices that reduce the force required to achieve the work required.

Use power amplification.

A low-power valve can be used to operate a larger air-operated valve to advantage in many applications.

Avoid long periods of continuous solenoid energizing.

- For 2-port and 3-port valves, use Normally Open types when seldom actuated to the off position and Normally Closed types for opposite scenarios
- For 4-port and 5-port valves, consider the use of a 2-position double solenoid valve when long periods of air output are required. This type of valve only requires a momentary signal to shift and can remain for very long periods of time in an actuated position
- A "UPS" system (uninterrupted power supply) may be a better alternative as part of a redundant safety system than relying on the interruption of continuous power supplied to a solenoid valve to initiate a stop sequence

4 Use The Correct Amount Of Air Pressure

Pressure is energy and energy is money. Using more energy than required for a single actuator adds up over time. Producing more pressure in a plant than is necessary multiples the effect.

- Consider "check type" regulators or using a check valve in parallel with a standard regulator to reduce pressure for the non-working stroke of an actuator that only requires high force in one direction
- Check load ratios and actuator sizing carefully to reduce unnecessary consumption
- Reduce the volume between directional control valves and actuators to eliminate waste and improve response time and control
- Reduce the compressed air pressure for the entire plant if only one or two applications are running at a higher pressure by using air intensifiers at point of use

5 Avoid The Use Of "Air Blow" Applications

When air blow is required, use efficient nozzle designs with minimum operating times and careful sizing techniques.

6 Use The "OFF" Switch

If the machine is not is use for a shift, a day, or a week, why supply pneumatic energy to it? Use a shut-off valve with a tight leakage specification to conserve energy. BP

This article originally appeared in the October 2011 Issue of the Fluid Power Journal under the title, "How Much Coal Does This Valve Burn."

To read more ***Pneumatics*** articles, visit
www.airbestpractices.com/technology/pneumatics

COMPRESSED AIR TRAINING; IT'S A GOLD MINE!

By Ron Marshall for the Compressed Air Challenge®

KNOW PRESSURE
COMPRESSED AIR CHALLENGE®

Employees of New Gold's New Afton Copper/Silver/Gold Mine, located just West of Kamloops, British Columbia, Canada have just completed an intensive round of Compressed Air Challenge and in-house compressed air efficiency training for their employees. The awareness raised by these seminars has already led to significant improvements to system efficiency. Further efforts initiated by Andrew Cooper, an Energy Specialist hired through special support from BC Hydro's Power Smart program are set to gain even more power savings and improve their compressed air system reliability and stability. Anchored by Compressed Air Challenge's Fundamentals of Compressed Air Systems webinar and through CAC's two-day Advance Management of Compressed Air Systems seminar, led by CAC L2 instructor Jeff Yarnall, the employees of New Afton mine now have a new appreciation of the true costs of compressed air.

CAC interviewed Andrew to find out more about his improvement efforts:

Please describe what you do at New Gold and the relationship between New Gold and BC Hydro:

I am employed as the Energy Specialist at New Gold. New Gold took advantage of the Energy Manager funding opportunity available through the BC Hydro's Power Smart program and established this position.

Why were you interested in Compressed Air Challenge training?

Since the majority of employees deal with compressed air in one way, shape or form,

Fundamentals of Compressed Air Systems WE (web-edition)

Learn about the high cost of compressed air and how to optimize your system by signing up for our *Fundamentals of Compressed Air Systems WE* (web-edition) coming September 10th. Or try one of our many in-person seminars being held in the coming months at locations across the country. Visit www.compressedairchallenge.org for more information.

If you have additional questions about the new web-based training or other CAC® training opportunities, please contact the CAC® at **info@compressedairchallenge.org.**

MARK YOUR CALENDAR!

INDUSTRIAL AUTOMATION NORTH AMERICA

at IMTS 2012

International Trade Show for Factory, Process and Building Automation Systems and Solutions

September 10 - 15, 2012
McCormick Place, Chicago, Illinois

HANNOVER MESSE'S global reach in manufacturing tradeshows extends to the USA in 2012!

IANA will be THE crossroads for automation innovation and productivity, where you can . . .

- Engage top industry decision makers and solution providers.
- Explore the latest advances in automation systems and technology.
- Gain competitive edge by comparing best practices across diverse platforms.
- Reap the collective expertise of more than 80,000 industrial peers.

IANA, the automation counterpoint to IMTS, will mechanize your approach to peak productivity in 2012.

To register for IANA and IMTS, please click visit www.imts.com/show/reg.html

Industrial Automation NORTH AMERICA

at

IMTS 2012

www.ia-na.com

Organized by:

Deutsche Messe Worldwide

Hannover Fairs USA, Inc.

Partner:

AMT The Association For Manufacturing Technology

Over 100 Years of Building Global Productivity

For more information, please contact
Aryan Zandieh at (312) 924-1688 or azandieh@hfusa.com.

COMPRESSED AIR TRAINING; IT'S A GOLD MINE!

we felt it was important to create awareness around its use. This started with the Energy Specialist doing a 30 minute Compressed Air Awareness training session for all employees on site. To date, approximately 300 people have been through this training.

A narrower cross-functional group of 20 people were selected to do the CAC Fundamentals of Compressed Air Webinar. This group was made up of employees from Mechanical & Electrical Maintenance, Engineering, Mine Operations, Processing, IT and Purchasing as we felt it was important for people across all functions of the organization to be aware of compressed air efficiency.

To further enhance compressed air knowledge, 13 New Gold employees attended the recent CAC Advanced Management of Compressed Air course. This course was co-sponsored by New Gold and BC Hydro and was attended by other Power Smart Energy Managers as well as by a few suppliers, both from BC and Alberta.

We feel that in order to be sustainable, energy management and efficiency should not be dependent on one person, but should be what is done by all employees on a day to day basis, as part of what we do at New Gold. The more people with the awareness and knowledge about compressed air efficiency, the better it is for the company as a whole.

Any idea how much your air systems are costing?

A recent audit done on the compressed air system for the underground compressed air supply only, estimated that the underground air was costing us about $315,000 per year. This did not include two 50 hp compressors

Andrew Cooper at New Gold's New Afton Mine.

at our batch plant, the 250 hp compressor a contractor had connected up to supply their surface jet-creting machine, or the various smaller compressors dotted around site. One could safely estimate that compressed air was costing the company approximately $400,000 per year. There are 3 new 350 hp compressors (2 running, 1 standby) soon to be commissioned in the new mill. This will obviously add significantly to the cost.

Any problems with them?

The underground compressed air system has one 300 hp compressor in a bad location underground, in warm dusty air. This makes for a high maintenance, inefficient machine.

Due to the large distances between the various compressors, they do not "talk" to each other and control independently. This results in uncoordinated load and unload times.

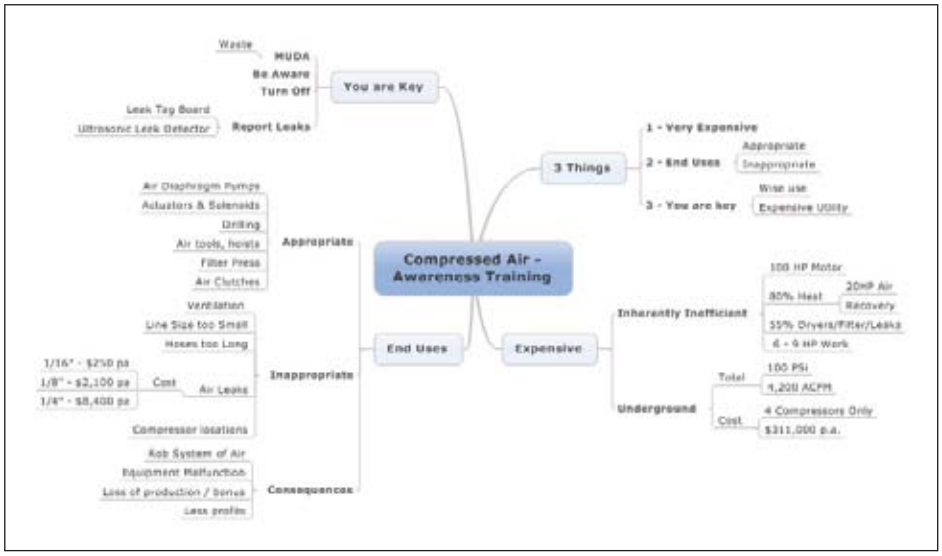
Although there is a huge volume of piping feeding underground, there are no receivers underground to accommodate large demand surges from equipment. It therefore takes a while for compressors 4 km away to react to a big demand from a piece of equipment. This is more than likely why the one 300 hp compressor was installed underground.

As a result of the CAC seminar did your employees find some issues with a new compressed air system?

The 3 new 350 hp mill compressors have been designed to feed into a common header in the compressor room. There is a check valve between each compressor and the header. The control pressure transducer for each compressor sits between the compressor and the check valve, so all compressors will not be able to see a common header pressure. Also the compressed air feeds enter the bottom of the header, so removing the check valves would mean that oil and water will be forced down the outlet pipe of an idle compressor

What are your future plans regarding your air system?

Funded by the BC Hydro Power Smart program, a local consultant is doing a



CAC® Qualified Instructor Profile

Jeff Yarnall
Rogers Machinery Co.
14650 S.W. 72nd
Portland, OR 97224
503-603-1935 cell: 503-706-1637
fax: 503-603-1994
jeff.yarnall@rogers-machinery.com

KNOW PRESSURE COMPRESSED AIR CHALLENGE

Jeff Yarnall is a Certified CAC L1 and L2 instructor and has over 30 years experience with compressed air and process vacuum systems, including; system design, applications, installation, troubleshooting, maintenance, controls and energy audits. A registered Professional Engineer his responsibilities include major capital project management, both in the United States and abroad, from engineering, sales, procurement, and documentation. Jeff also serves as consultant to clients for energy audits and assessments, educational instruction, and system design.

Jeff has devised comprehensive deterministic simulation models for compressed air systems which allow the evaluation of "what if" scenarios for clients.

Over 1500 people have attended Jeff's classes on compressor maintenance, system optimization, and the Compressed Air Challenge with excellent reviews. In addition to class room theory, Jeff uses the experience of over 800 audits to illustrate the practical side of compressed air systems operations.

COMPRESSED AIR TRAINING; IT'S A GOLD MINE!

Best Practices for Compressed Air Systems Second Edition

This 325 page manual begins with the considerations for analyzing existing systems or designing new ones, and continues through the compressor supply to the auxiliary equipment and distribution system to the end uses. Learn how to use measurements to audit your own system, calculate the cost of compressed air and even how to interpret utility electric bills. Best practice recommendations for selection, installation, maintenance and operation of all the equipment and components within the compressed air system are in bold font and are easily selected from each section.

feasibility study on relocating all compressors feeding the underground air system to a centralized location and, if possible, installing receivers at strategic locations underground. We expect that significant savings will be realized by doing this.

The mill compressors are water cooled, with a centralized chiller doing the cooling. We are looking at a project to recover heat from this chiller and use this heat for space heating in our mill during the winter.

We will be auditing the batch plant compressed air system ourselves as there are opportunities for efficiency improvements and heat recovery in this area.

Did the training help with these plans?

The training has most definitely helped with these plans. We are more aware of what to look for in terms of inefficiencies and of what is required when redesigning or upgrading a compressed air system. Cross functional training has made people more aware of life cycle costing, the importance of maintenance and the importance of minimizing leaks in the mine.

An electrician who had been through the basic awareness training discovered an always open ½" blow down valve on a contractor's 250 hp compressor receiver. Because of the training he approached the contractor and notified me. The drain was open because the air was too wet. We found that the solenoid valve on the oil/water separator after the compressor after-cooler was not working. This was repaired and we purchased a no-loss drain for the receiver. I've had numerous people approach me and tell me that they have fixed small leaks. Little things like this prove that even basic awareness training can pay dividends.

In addition to the above plans, we have launched a leak tag and repair program. BC Hydro supplied leak tag boards, New Gold had leak tag cards made up and set up the coding in SAP, our computerized maintenance system, to process and sort air leak notifications. We are currently finalizing training on the correct way to enter a notification so that we can monitor and track the progress of leak repairs.

Can you tell me more about your 30 minute compressed air training?

This was designed to be more of an awareness session rather than training. I wanted to make it informal so did not use any slides. The objectives were to:

- Create awareness around why compressed air is so expensive
- Create awareness about the compressed air management initiatives New Gold is undertaking
- Promote discussion around the uses of compressed air

"New Gold is a company that has gotten serious about compressed air and has sent several people to both CAC classes. I expect great things from them in the coming year."

— Jeff Yarnall, Rogers Machinery Co.

What do you talk about in the training, do you have an outline?

We created the training in a Mind Map format (Figure 1). The discussion was based on 3 points I "stole" from a consultant's presentation at the BC Hydro Powersmart Forum last year — I did get his OK. We made up a demonstration air system with some "leaks" and a hand pump "compressor" to show the folks the effect increasing air leak sizes have on a system. We had the leak tag boards, leak tag cards and an ultrasonic leak detector to show as well.

What is the most common feedback/ impression you get from the attendees about this training?

Attendees were surprised at the small percentage of work output you get from a compressor relative to the input. I equated this to heating in a home, which made the numbers more realistic.

How are you tracking the results of your improvement efforts?

We had to set up our maintenance system to be able to track improvements and have recently completed this project. We have a summer student starting next week whose main task is going to be setting up systems for compressed air leak management and recording.

For our underground air system, we wanted to do a proper baseline test prior to the start of major improvements. We currently have data loggers on the system for purposes of creating a baseline and looking at the feasibility of an efficiency upgrade projects.

Based on the Compressed Air Challenge training, what are the top three things you feel you have learned that are the most valuable?

Things learned:

- Importance of up-front design to save time and money down the line
- Calculations for storage to deal with short duration, high cfm applications
- Need for constant diligent monitoring and maintenance of compressed air systems,
- Control compressors to match plant demand

Comments from L2 Instructor Jeff Yarnall:

Companies like New Gold know that to prosper in a competitive world-wide market every cost must be managed. Compressed air and its associated costs were rarely managed in the past, but now you can. Training offered by the Compressed Air Challenge helps to stimulate awareness and action. New Gold is a company that has gotten serious about compressed air and has sent several people to both CAC classes. I expect great things from them in the coming year. Remember, you can dig gold out of the ground or you can create it by managing your compressed air system wisely. BP

New Gold's Leak Tag Board raises awareness by taking a prominent position in their facility.

To read more ***System Assessment*** articles, visit www.airbestpractices.com/system-assessments/leaks

RESOURCES FOR ENERGY ENGINEERS

TECHNOLOGY PICKS

Atlas Copco Compressors Launches the Next Generation of the GA Range

Atlas Copco Compressors has introduced the next generation of the 40 to 125 horsepower GA oil-injected screw air compressor range, featuring improved components that provide unparalleled performance, sustainability, efficiency and reliability. The range includes three options: the GA 37-90 VSD (50 to 125 hp), the GA 30+-75+ (40 to 100 hp) premium fixed-speed variant, and the GA 37-90 (50 to 125 hp), which delivers solid performance and Free Air Delivery (FAD) in a base package.

The GA 30+-75+ VSD can deliver an average 35% energy savings, while eliminating compressor idle time and blow-off loss; starting up under pressure reduces life cycle costs up to another 22%. The premium efficiency fixed-speed variant GA 30+-75+ offers industry-leading efficiency and best in class FAD.

An improved layout beneath the GA's "cool canopy," combined with its single-ducting principle, help drive performance, efficiency, and serviceability. Atlas Copco has also introduced IE³/NEMA premium efficiency motors, in combination with high-efficiency screw elements, for all ranges. As a result of these features, temperatures at the GA's element have decreased by an average of 18 °F.

"With industry-leading free air delivery, low-energy requirements and low element outlet temperatures surrounded by a cool, maintenance-free canopy, our new oil-injected screw compressors reinforce Atlas Copco's commitment to continued innovation," said Robert Eshelman, Vice President Industrial Air for Atlas Copco Compressors, LLC. "This new compressor range provides our customers with a clear value that matches various compressed air needs and can help boost productivity in even the harshest environments."

The integrated design and industry-leading low noise operation of the new GA range allows the compressor to be placed right at the heart of the production environment. Combined with the integration of the air and condensate treatment equipment, the new GA range offers complete versatility for the customer. The GA's integrated dryer, an option for all machines in the range, uses an environmentally friendly refrigerant (R410A) that reduces the dryer's power consumption by up to 50% and does not contribute to ozone depletion.

The next generation GA line also includes a number of improvements to the oil-treatment system, resulting in up to 50% less oil use and reduced maintenance demands. And the air compressor's condensate can be safely disposed of directly into a sewage treatment system, due to the GA's integrated condensate treatment, making it suitable for ISO 14001 certified companies.

The new GA line also features Atlas Copco's Elektronikon®, the compressor control system that provides system managers with round-the-clock remote monitoring capabilities. An "app" is also available to allow remote monitoring from smart devices.

In addition to increased cooling capabilities, the GA's new electrical cubicle also features a forced air cooling system, which draws in less conductive dust and particulate matter, extending the life of the internal electrical components.

www.atlascopco.com

Parker Hannifin's Transair Pipe Technology Now Applicable For Large Scale Compressed Air Applications

Parker Hannifin has expanded its range of lightweight aluminum Transair pipe system with the introduction of a new large diameter/high volume version to meet the demands of large industrial manufacturing sites utilizing compressed air, vacuum and inert gas applications. Ideal for use as the primary piping system for compressed air in a diverse range of industries, from automotive and aeronautics, through food processing to woodworking, the new six inch (168mm) diameter pipe system has been designed to complement the existing range of 16.5mm to 100mm pipe diameter sizes.

COMPRESSED AIR
BEST PRACTICES
airbestpractices.com

FREE SUBSCRIPTION

DIGITAL EDITION FREE WORLDWIDE | PRINT EDITION FREE TO U.S. SUBSCRIBERS

2012 FOCUS INDUSTRIES!

Beverage Bottling • Plastics • Food Packaging & Containers • Chemical & Powders • System Assessments • Woodworking/Building Materials • Compressed Air System Automation • Wastewater Treatment • Food Processing • Automotive • Air Compressor Controls

Sustainable Energy Savings for Compressed Air Best Practices®

Compressed Air Best Practices® is a technical magazine dedicated to discovering **Energy Savings** and **Productivity Improvement Opportunities** in compressed air systems for specific **Focus Industries**. Each edition outlines "Best Practices" for compressed air users — particularly those involved in **managing energy costs in multi-factory organizations**.

Utility and energy engineers, utility providers and compressed air auditors share techniques on how to audit the "demand side" of a system — including the **Pneumatic Circuits** on machines. This application knowledge allows the magazine to recommend "**Best Practices**" for the "supply side" of the system. For this reason, we feature **air compressor, air treatment, measurement and management, pneumatics, blower and vacuum** technologies as they relate to the requirements of the monthly **Focus Industry**.

- **Compressed Air Users — Focus Industry**
  - A. Energy and utility managers share experiences
  - B. Audit case studies and "Best Practice" recommendations
- **Utility Providers & Air Auditors**
  - A. Utility company rebate programs
  - B. Case studies by expert compressed air auditors
- **Compressed Air Industry**
  - A. Profiles of manufacturers and distributors
  - B. Product technologies best suited for the focus industries
  - C. Industry news

To subscribe visit airbestpractices.com

International pricing for print edition — $65 in Canada and $95 for other countries.

RESOURCES FOR ENERGY ENGINEERS

TECHNOLOGY PICKS

Developed as a clean and efficient alternative to traditional galvanized steel or copper compressed air systems, Transair pipe systems feature exceptionally smooth bore to ensure optimal flow characteristics and superior energy efficiency, enabling compressed air customers to drive down operating costs while improving functionality, productivity and efficiency significantly. For instance, the capital and operating costs of the Transair system are typically less than 10% of those of traditional steel welded pipe systems, over a 10 year period.

This pipe system is quick and easy to assemble, ensuring a leak free mechanical connection without the need for crimping or welding. Transair's components are also removable and interchangeable and enable manufacturing plant personnel to implement many layout changes within minutes, not hours. Transair can also be integrated into existing copper and steel piping without compromising performance, making it ideal for upgrades or expansion projects. Transair pipe systems are ultra robust, compact and lightweight, compared to galvanized steel equivalents that require considerable structural support.

Transair has been specifically designed to ensure a lower impact on the environment. In a life cycle analysis, from production of raw materials to end of product life, the use of six inch Transair is five times less harmful to the environment than a traditional steel pipe system. Equally, the new six inch diameter version has a far lower carbon footprint due to the method of manufacture and reduced use of electricity, which can be as much as 80% less than traditional galvanized steel.

As with all Parker products, the Transair system is backed by a ten year guarantee as well the notable support offered through the company's global network for manufacturing, sales and customer service.

www.parker.com

Festo Introduces the NPQP Polypropylene Push-Pull Pneumatic Fitting Series

Festo is introducing a new addition to its portfolio of push-pull fittings. The new metric NPQP fitting series is focused on the most popular fitting functions and offers resistance to aggressive media due to the polypropylene material utilized. In addition, this NPQP series provides an economic alternative to St. St. fittings.

Tubing connections feature sizes from 4 to 12 mm OD and threaded types feature 1/8 to ½ R threads.

Product Scope:

- 15 styles
- Total of 99 types

When functionality and economics are important criteria in applications exposed to harsh cleaning detergents or in aggressive environments, the NPQP fitting series delivers a viable solution. These fittings are suitable to connect with flexible plastic tubing for a variety of pneumatic applications in such industries as food and beverage, packaging, bio-pharmaceutical, and process.

Features:

- Polypropylene body, including threaded portion and releasing sleeve
- St. St. tube gripping teeth
- EPDM Sealing rings
- Clean room packaged

For sales information, call Festo at 800-993-3786.

www.festo.com

TECHNOLOGY PICKS

High Speed Proportional Valves Drive Air Engine

The Enfield LS series of valves provided the performance and response time necessary for the development of our customer's next generation teroidal engine.

Our expertise in flow, pressure, position and force control allows for advanced developments, yet also bridges the gap to high performance needs in many traditional applications.

Enfield high speed proportional valves can be found in many applications ranging from **case packing, edge guides and fatigue testing to guidance systems, vibration isolation and advanced energy projects.**

Tell us about your project. Use code **CGET517** by June 15 to receive an additional 5% off.

ENFIELD TECHNOLOGIES

www.enfieldtech.com

SKF launches new SE bearing housing series

SKF announced the launch of its new SE bearing housings. The new housings are an upgrade of the highly successful SNL housing series, which have been used in many industries for very many years.

The new SE housing is a very reliable, versatile solution for mounted bearing applications and is designed to meet the needs of customer applications across virtually all industrial and processing sectors.

These housings, which range from size SE 507-606 to SE 532, have special design features to exploit the full service life potential of the incorporated bearings, and significantly reduce maintenance costs and related downtime.

The specific features are:

- *Upgraded material*
  To accommodate the increased load carrying capacity of SKF bearings, SE housings are made of a higher strength grey cast iron that can accommodate heavier loads

- *Stiffer, more robust design*
  The SE housing's new design makes it extremely unlikely for the housing to become distorted by over-tightening the attachment bolts
- *Reduced grease consumption*
  The SE housing has an effective grease guiding system, for relubrication from the side, that applies grease directly to the bearing during relubrication. With the grease guiding system, the bearing is greased more reliably, making it possible to reduce grease quantities during relubrication
- *Reduced operating temperatures*
  When compared to SNL housings, the new SE housing design improves heat transfer from the bearing outer ring to the support surface, which reduces the temperature in the bearing. Reduced operating temperatures make it possible to extend relubrication intervals while increasing the service life of the bearing and lubricant
- *Improved rust protection*
  These high quality housings provide improved rust protection that is in accordance with the C3 corrosivity class (ISO 12944)
- *EPD assessed*
  A declaration of the environmental performance of SE housings is described in an Environmental Product Declaration (EPD), according to ISO 14025.

www.skf.com

COMPRESSED AIR BEST PRACTICES®
www.airbestpractices.com

ADVERTISER INDEX

RESOURCES FOR ENERGY ENGINEERS

TECHNOLOGY PICKS

CE Compliant Air Nozzles Increase Efficiency And Decrease Overhead

EXAIR's family of Air Nozzles -- from the tiny new Model 1108SS Atto Super Air Nozzle at 2.0 ounces (56.7 grams) of blowing force to the high power Model 1120 Large Super Air Nozzle at 23 pounds (10.4 kg) of strong blowoff force — have always provided safe, economical performance. Independent laboratory tests now certify that EXAIR's entire Air Nozzle family has also met the rigorous safety, health, and environmental standards of the European Union in order to attain the CE mark.

By entraining high volumes of room air, EXAIR's Super Air Nozzles use less compressed air and less energy to provide superior performance to other blowoff products. Unlike open pipe and nozzles that haven't been optimized, ***none of EXAIR's large selection of Super Air Nozzles can be blocked,*** meeting OSHA's standard for dead-end pressure 29 CFR 1910.242(b). All of EXAIR's Super Air Nozzles also fall within OSHA's noise requirement 29 CFR 1910.95(a). Prices start at $21.

Contact: EXAIR Corporation
Tel: (800) 903-9247
E-mail: techelp@exair.com
www.exair.com/cs.htm

COMPRESSED AIR BEST PRACTICES®
www.airbestpractices.com

Advertising &: Editorial — Rod Smith
rod@airbestpractices.com
Tel: 412-980-9901

Subscriptions &: Administration — Patricia Smith
patricia@airbestpractices.com
Tel: 412-980-9902

A Publication of: Smith Onandia Communications LLC
217 Deer Meadow Drive
Pittsburgh, PA 15241

Compressed Air Best Practices® is published monthly by Smith Onandia Communications LLC., 217 Deer Meadow Drive, Pittsburgh, PA 15241. Phone 412-980-9902, email patricia@airbestpractices.com. Compressed Air Best Practices® is a trademark of Smith Onandia Communications, LLC. Publisher cannot be held liable for non-delivery due to circumstances beyond its control. No refunds. Standard postage is paid at 233 Jefferson Street, Greenfield, Ohio 45123. Canadian and international distribution: IMEX International Mail Express, 1842 Brummel Drive, Elk Grove Village, IL 60007. POSTMASTER: Send address changes to Compressed Air Best Practices,® 217 Deer Meadow Drive, Pittsburgh, PA 15241. SUBSCRIPTIONS: Qualified reader subscriptions are accepted from compressed air professionals, plant managers, plant engineers, service and maintenance managers, operations managers, auditors, and energy engineers in manufacturing plants and engineering/consulting firms in the U.S. To apply for qualified reader subscriptions, please fill in the reader response cards herein and mail or fax or go to www.airbestpractices.com. To non-qualified subscribers subscriptions are $65 in Canada and $95 for other countries. When available, extra copies of back issues are $4 plus shipping. Contact Patricia Smith for subscription information at Tel: 412-980-9902 or email: patricia@airbestpractices.com. REPRINTS: Reprints are available on a custom basis, contact Patricia Smith for a price quotation at Tel: 412-980-9902 or email: patricia@airbestpractices.com.

THE MARKETPLACE

JOBS

DENVER BRANCH MANAGER

Required experience of 5-7 years in sales management. Strong understanding of customer dynamics and requirements. Experience with budgets, supervision, project management, and driving sales teams.

Send resumes to:
Joi Hill, HR Manager
Compression Leasing Services
jhill@compressionleasing.com
www.compressionleasing.com

REGIONAL SALES MANAGER SIHI^{dry}

We have an immediate opening for an experienced RSM at SIHI^{dry} to join a rapidly growing, high performance sales team. This position will focus on our customers in the eastern U.S. region and can operate out of a home office.

SIHI^{dry} is a unique vertical, dry screw vacuum pump with a complete range of sizes and two distinct product lines for the chemical/pharmaceutical markets as well as the industrial markets.

Dry vacuum pump experience is required with chem/pharma/industrial vacuum applications. B.S. in Chemical or Mechanical Engineering, with 5 to 10 years related experience in the pump industry is required.

Please send your resume in confidence to:
Human Resources Department
SIHI Pumps, Inc.
P.O. Box 460, 303 Industrial Drive
Grand Island, NY 14072
Email: opportunities@sihi.com, www.sihi-pumps.com

EOE

SERVICE MANAGER

We are an established Ohio Compressed Air Distributor with many years of growth and success. We are currently looking for a Corporate Service Manager to operate and run our Service department of 15 Technicians and 3 support staff employees. We offer a very competitive and incentivized salary/benefit package.

Required Qualifications

- Proven track record of managing all aspects of customer care
- Dedication to Customer Service and support
- Organizing and Managing skills to manage technicians and service support staff
- Field and Field Service experience in Compressed Air
- Computer proficiency with MS-Office products and ability to learn service management software.

Responsibilities

- Increase efficiency and profitability in both Service and Parts departments
- Organize and Manage Service Schedules
- Troubleshoot and Pre-qualify Service issues via telephone
- Occasional in field service calls
- Implementation of routine customer follow up for satisfaction evaluation and future service retention
- Grow service work from existing equipment customers.

Please submit your resume and salary requirements to rod@airbestpractices.com.

Compensation will be based upon experience.

HITACHI
Inspire the Next

HITACHI SCROLL DISTRIBUTION OPPORTUNITY

Interested to become a partner with Hitachi for 1.5–16.5kW Oil-Less Scroll Units?

Please contact us at
airtechinfo@hal.hitachi.com
or call 704-494-3008 x28

To learn more about our products visit
www.hitachi-america.us/airtech

A well-established Compressor manufacturer is looking for energetic technical Outside Sales candidates to fill a variety of openings throughout California & the Pacific Northwest.

- Must have a high technical aptitude with experience selling a mechanically engineered product.
- Rotating equipment experience is preferred.
- Looking for those who are hungry for success and willing to make a long term commitment to the company.
- This position offers a lot of upward mobility and many opportunities for travel.

To find out more about this opportunity, please call Joe Bertolami at **440-684-6150 X 3007** or email **jbertolami@grsrecruiting.com**

GRS Fluid Handling specializes in recruiting professionals in the Compressor, Pump and Filtration Industries.

View more jobs online at **grsrecruiting.com**

THE MARKETPLACE

TECHNOLOGY

Celebrating 35 Years of Leadership

35th Anniversary

WEEC World Energy Engineering Congress

2012 WORLD ENERGY ENGINEERING CONGRESS

WEEC CONFERENCE COVERAGE

OCTOBER 31 – NOVEMBER 2, 2012 IN ATLANTA, GA

The WEEC Opening Session will feature, Keynote Speaker General Colin L. Powell, USA (Ret.), General John P. Jumper, USAF (Ret.), President and Chief Executive Officer Science Applications International Corporation, Jay Hakes, Director of the Jimmy Carter Presidential Library & Museum, and Susan Story, President & CEO of Southern Company Services. Former President Jimmy Carter will deliver a video address to all WEEC attendees. The Closing Keynote Luncheon will feature Legendary Anchor and Special Correspondent for NBC's Rock Center, Ted Koppel.

Go to www.energycongress.com for more information about this event.

WEEC CONFERENCE AND EXPO TARGETS THE COMPLETE SPECTRUM OF TECHNOLOGIES AND SOLUTIONS

- *Energy Efficiency and Energy Management*
- *Applications Specific to Federal Energy Management Programs*
- *Renewable, Green and Alternative Energy*
- *Combined Heat & Power / Distributed Generation*
- *Smart Grid and Electric Metering Innovations*
- *Thermal Storage and Load Management*
- *Measurement & Verification*
- *Integrated Building Automation & Energy Management*
- *Boilers and Combustion Controls*
- *Geoexchange Technologies*
- *Solar and Fuel Cell Technologies*
- *Energy Services and Project Financing*
- *Lighting Efficiency*
- *Industrial Energy Management*

PRESENTED BY

35 Years of Achievement

aee The Association of Energy Engineers

HOSTED BY

SAIC®

PLATINUM SPONSOR

Georgia Power
A Southern Company

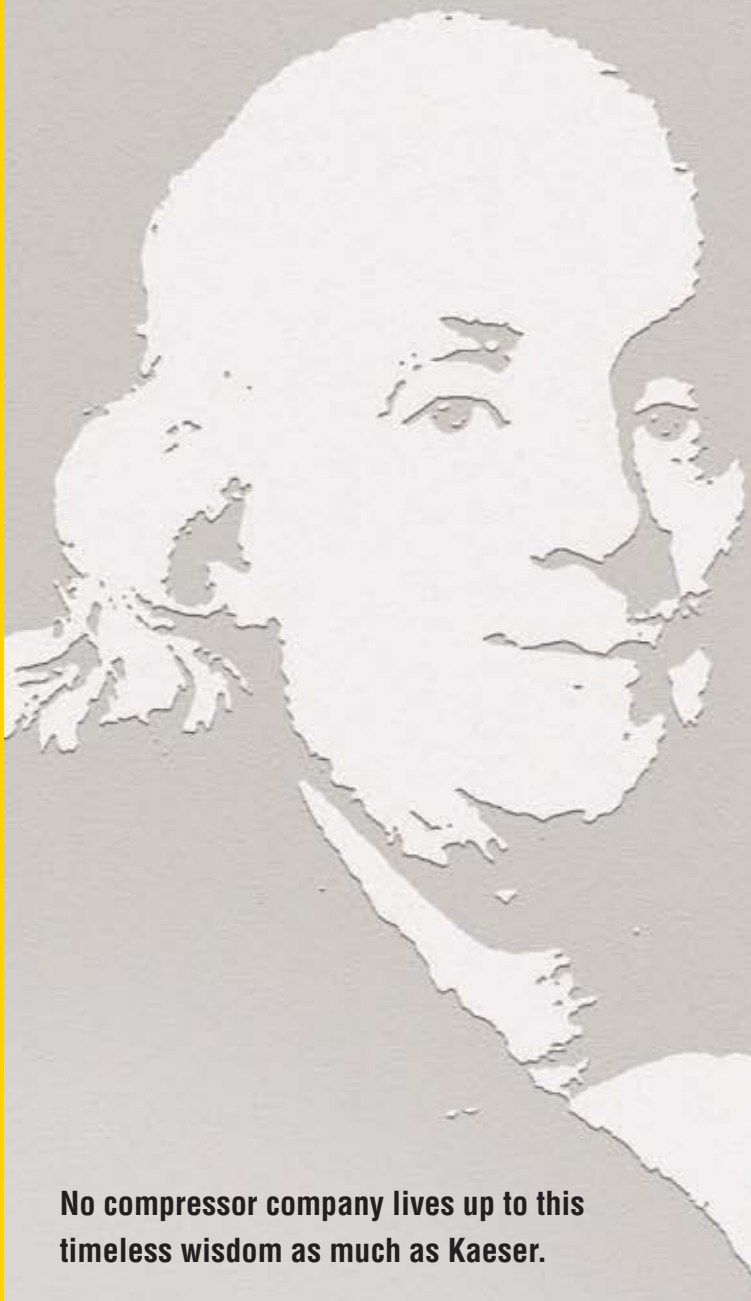
www.energycongress.com · 770-447-5083

SAVE $200 ON YOUR WEEC CONFERENCE REGISTRATION, SIMPLY ENTER COUPON CODE "WEEC12AD" UPON CHECKOUT

"THE WORLD ENERGY ENGINEERING CONGRESS (WEEC) COMES TO ATLANTA TO CELEBRATE ITS 35TH ANNIVERSARY"

KAESER COMPRESSORS

Built for a lifetime.™



"A penny saved is a penny earned."

— Benjamin Franklin

No compressor company lives up to this timeless wisdom as much as Kaeser.

In compressed air systems, life cycle costs far outweigh the initial purchase price. That's why so many industrial plants choose Kaeser.

Our equipment and system solutions deliver dramatic energy savings along with more reliable plant operation and less downtime. That means significant dollar savings along with hassle-free operation.

Add in our reputation for superior customer service … and it's no wonder Kaeser delivers the best value for the price. It's the wise choice every time!

Contact us today to learn more about the powerful benefits of owning a Kaeser compressed air system.

Kaeser Compressors, Inc. • 800-777-7873 • kaeser.com/CABP

Scan this code for more info.

kaeser.com