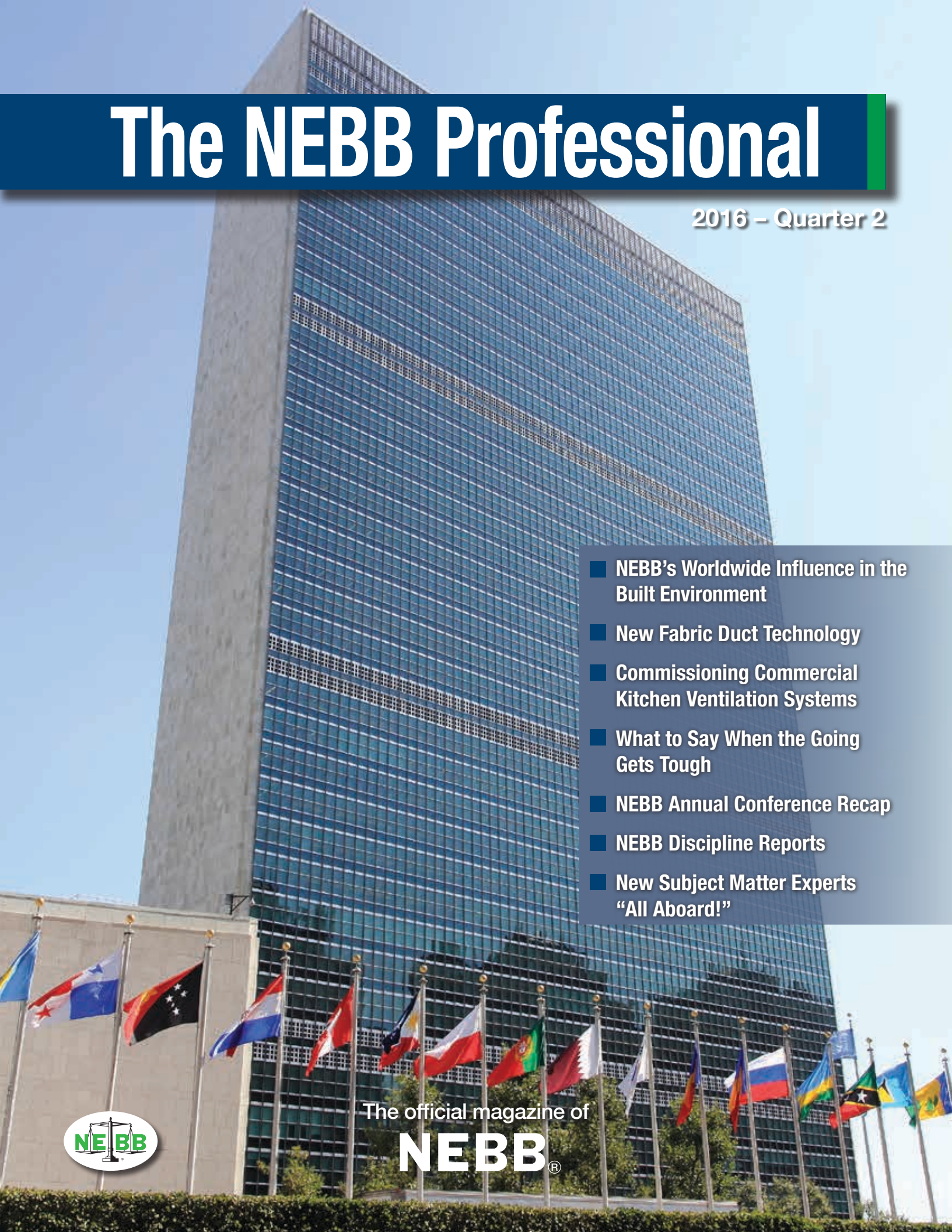
The NEBB Professional

2016 – Quarter 2



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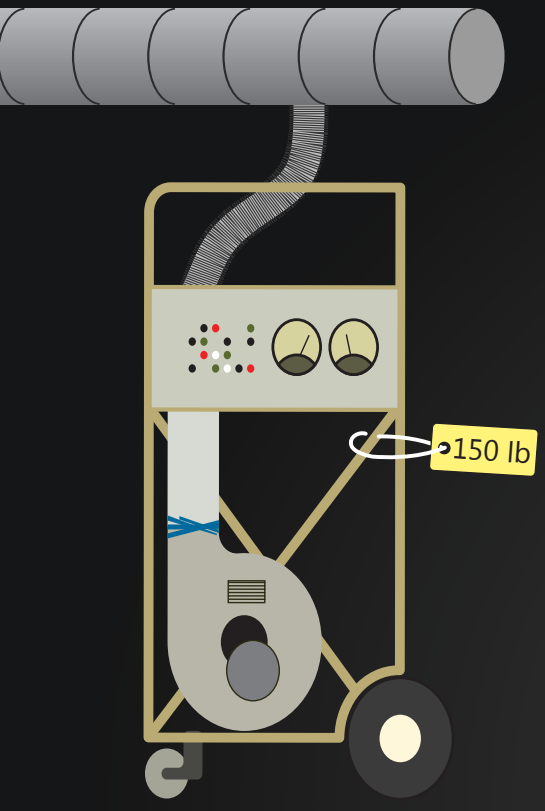

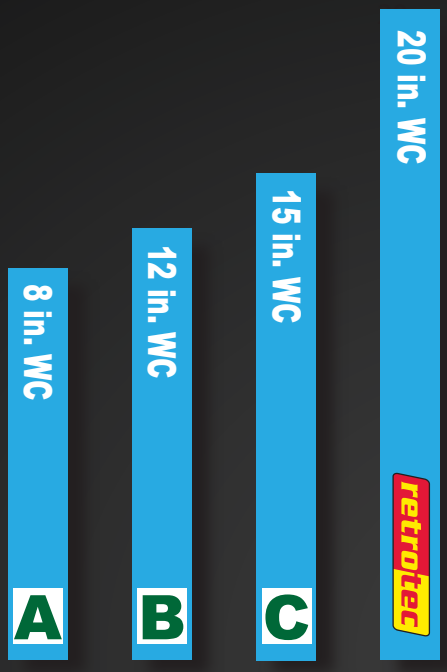

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President's Message

Dear Colleagues,

The 2016 NEBB Annual Conference is already behind us. Albuquerque was a great location and the hotel facilities were perfectly aligned with the needs of our conference, providing an excellent venue for committee meetings, technical sessions, exhibits and social activities.

Again, I wish to express my gratitude to our professional staff who made the conference a success. I would like to acknowledge Cheryl Gendron's effort in preparing and overseeing the conference. Cheryl has left NEBB for a new opportunity and we offer her our best wishes as her career moves into a new direction.

I also want to express my gratitude to all our volunteers who worked countless hours in our various committee meetings. The amount of work and dedication they bring to NEBB is unbelievable. This was readily apparent at the Town Hall/Business Meeting while I was listening to their verbal reports to those assembled.

One element that really struck me during the conference is the attendance from individuals coming from all over the world. This year, it was a revelation to me since there are more and more individuals travelling from across the globe to NEBB for education, training and technical seminars. It shows me NEBB is really doing great work and continues to be more widely recognized as an authority in our disciplines.

While travelling back home, I was thinking to myself, these attendees bring to NEBB a real international flavor. This element keeps coming back to my mind and I have concluded that NEBB needs to look overseas, to bring its unique expertise and help our friends from all over the world, and to develop their competences and expertise in the HVAC industry. NEBB needs to get closer to them in order to listen to their needs and challenges. We have to develop tools and forums for our overseas affiliates, where they will be able to find solutions and opportunities. We need to look for better and faster ways to serve them, to get them more involved in our programs, and more active in our organization. The success of NEBB Australia and NEBB Canada demonstrates that we have the ability to foster international relations and establish NEBB strongholds across the globe.

Many other challenges are in front of us. One is the fact that we need to increase the participation of younger people in our organization. This is also a unique challenge and I intend to work very hard in order to implement a program that will help facilitate the participation of the younger people in our ranks.

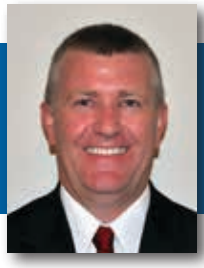
At the conference there was much discussion of "best practices" in the context of our certification programs. The implementation of the best practices across all our disciplines, whether they are ANSI accreditation candidates or not, will improve our programs and remains a top priority. It was heartening to see our technical committees and Certification Board coming together in Albuquerque to develop more comprehensive Bodies of Knowledge, which are the foundation of both education and certification programming. The 2016 conference provided the opportunity to explain our plan for the future to our affiliates and offer a clear picture of the organization as it stands right now and where it is heading for the future.

In conclusion, I would like to reaffirm that NEBB has a bright future and it is incumbent upon all of us to make sure we are aligned towards the same goal in making sure we are providing the best services to our affiliates – and our customers – worldwide.

Sincerely,

Jean-Paul LeBlanc
NEBB President

President-Elect Message: Volunteers are NEBB's Heart and Soul



The NEBB 2016 Annual Conference, held April in Albuquerque, NM offered attendees a wide array of top-notch educational sessions, opportunities to meet with exhibitors and see their products, and really fun social events featuring fantastic cuisine. I want to pass along my gratitude to Jean-Paul and Monelle for the time and effort they put into NEBB's 2016 Annual Conference. The content and flow of the conference was remarkable, and a rewarding experience for all who attended.

I am continually awed by the volunteer spirit that runs through our organization. That spirit was shining bright in Albuquerque. Three full days before most attendees arrived for the conference, NEBB Committees were hard at work. Volunteers from around the country, and a few from overseas as well, spent their time writing industry standards, developing educational programs, and crafting certification exam questions. I had the pleasure of attending several of these meetings.

The Building Systems Commissioning Committee, led by Chairman Jim Bochat, was sequestered for two full days behind closed doors, working on the draft technical retro commissioning standard that is slated for ANSI approval, as well as curriculum for upcoming Cx and RCx seminars. Simultaneously, the Fume Hood Testing Committee, TAB Committee, Cleanroom Performance Testing Committee, Marketing Committee and Chapter Affairs Committee were hard at work at their one- or two-day meetings.

The Building Enclosure Testing Committee conducted a two-day seminar in Albuquerque. Committee Chair Phil Emory served as primary instructor for a class of 12 who sat for the BET CP exam after the event. The TAB Committee offered a workshop for practical examiners, as did the Sound & Vibration Committee.

The Chapter Coordinators meeting was well attended, with representatives from nearly all of NEBB's 26 chapters in attendance. Chair Lyn Dyason, Chapter Coordinator from NEBB Australia, led the group through a robust agenda. The following day's Chapter Presidents Meeting was equally well attended, with the NEBB President, myself and Chapter Affairs Committee Chair present to field questions and facilitate discussions.

The NEBB Past President's Meeting was attended by 10 past presidents, the NEBB Executive Finance Committee and senior NEBB staff. It is great that NEBB honors and includes its past presidents in meaningful forums like this, to both update them on association activities and gain the benefit of their wisdom and experience.

The NEBB Board of Directors held two meetings in Albuquerque, including an "Open Meeting" where any NEBB stakeholder could attend. The Certification Board met for two days, and also held sessions with all of NEBB's Committee Chairs. The term "BoK" - short for Body of Knowledge - was heard often. Technical Committees are teaming up with the Certification Board to create specific BoKs that serve as foundations for both training programs and certification exams in each NEBB discipline.

These activities are only part of the volunteer work that went into making the 2016 annual conference a huge success. Other volunteers took on key roles in coordinating the annual golf tournament, the guest tours, and social activities. Nearly all technical session speakers were volunteers.

The amount of time, dedication and passion NEBB volunteers put into the organization is remarkable. Seeing that energy channeled into so many meaningful activities is truly gratifying. A conservative calculation of volunteer time spent at the conference this year is an impressive 840 hours.

In conclusion, I want to thank NEBB's volunteers for the contributions put forward at the Albuquerque conference. Your efforts are what make NEBB such a great organization. I look forward to seeing you next year in Disney.

Jim Kelleher
NEBB President-Elect

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NEBB's Worldwide Influence in the Built Environment

Bert Henderson | AZS Consulting

The great world-renowned playwright, William Shakespeare wrote these famous lines, "To be or not to be, that is the question." The question in our discussion is, as an international test and balance (TAB) professional, "To be or not to be NEBB certified? That is the question." There are stakeholders of NEBB all over the world who might say the same thing when the conversation turns to "Why be NEBB certified?" Some participants may consider certification not necessary in their sphere of control. However, there are those who have a strong presence with an attractive energy that turns heads and draws people to them because they are found successful and knowledgeable in their sphere of professional influence.

Those with that personality see certification as a means to a validation of their skills, ethics, abilities, and knowledge by their peers. If a professional is tested by a third party organization then that documents the person as a professional with the go-to skills, technical expertise, and authoritative subject knowledge. It is not unlike owning a $100,000 Porsche and trusting the car to a certified service representative over a gas station mechanic with no credentials of any kind.

> "Certification means money, both to the company and the certified employee. The benefits to the company are numerous. The certified shop is apt to be more efficient and productive. A certified shop can traditionally handle twice as much equipment (and processes) as a non-certified shop,…"
>
> (Tobin Maginnis, "Why Be Certified?" Linux Journal, May 01, 2001, www.linuxjournal.com).

There are more than 700 NEBB certified firms worldwide and over 1,000 NEBB certified professionals and certified technicians. These firms and their personnel are recognized as highly skilled experts who are able to measure the efficiency of building systems and provide customized solutions for the business and building owners. NEBB certification is tangible proof of their qualification to perform their work in accordance with strict NEBB ethics and procedural standards worldwide. NEBB maintains their integrity through high standards and quality programs that continue to demonstrate the capabilities of their certified firms. Because of the continued and growing success of NEBB's certified firms their credibility remains high.

As the "green" industry continues meteoric growth a recognized and valid certification program spreads like wildfire. "I've seen the growth of the NEBB program in the past 12 years in Australia that has been extraordinary," says Lyn Dyason, NEBB Australian Chapter coordinator. "The NEBB brand is very well recognized in the industry here. There are more and more people in Australia, New Zealand, and the Far East who continue to recognize NEBB and use the NEBB processes for TAB."

"NEBB was presented to us as relevant to the fine tuning of our installed systems and they are very practical in their message," said Chris Wright, NEBB Australia chairman, and National Board Member. "NEBB provides an accredited certification that is becoming more relevant today as we move through the Digital Age. Being NEBB certified has benefited the credibility of my company to all the clients I work with. NEBB is an asset on every project we tender or work on and the NEBB certification gives the consultants and clients that we work with faith that we know what we are doing." Chris's

customers know that NEBB provides an International Standard Practice to the work he does and the consultants who oversee his projects are comfortable with NEBB. "Firms in our state have always provided good quality TAB projects," Chris says. "As the Australian chairmen of NEBB, part of my job is to encourage as many of our fellow Australian professionals to get on board the NEBB Technician Certification program. That is the best introduction to anyone in our Industry."

"NEBB provides the background, knowledge, procedural standards, and certification, that we need to be able to do our own TAB," says Neil Marshall, NEBB Past President, retired. "NEBB is recognized throughout the industry in Australia and America. As a member of NEBB you increase your standard of work to a point that the effort is universally accepted as being the right way to do TAB and that is recognized as a methodology that is acceptable in the industry."

"I believe that the TAB or commissioning people are like an orchestra maestro," says Tarek Omar, general manager TAB, Egypt and NEBB marketing and TAB committee corresponding member. "No one can feel the conductor's presence, but the orchestra cannot perform without him. As an engineer, the reference and standards are the basics of my thinking and acting. NEBB gave me the chance to standardize my work based on a global organization that is known and respected by all who work in the field." Tarek is attracted to NEBB because of the variety of disciplines that NEBB has. "For me, that means that you can develop yourself and your business without any need to go outside of NEBB," said Tarek.

"NEBB's knowledge of systems and how to test them showed me that there was more to fault finding than trial and error," said Paul Chasteauneuf, technical support manager for AG Coombs, Moorabbin, Victoria, Australia. "Using engineering theory and knowing the difference between what something will do in the field and the theoretical calculations is the key to solving any field problem successfully. NEBB educational programs provide both theoretical and practical guidance." He says, "When I started off as a refrigeration service mechanic, the small company I worked for had a two man commissioning department. Anytime our best service guys had a problem with controls either air or water flow, they would discuss the problem with the guys in our commissioning department. Both Eddie Park and Jim Owens, who were NEBB TAB certified would always know what the next step would be or what to test to find the solution. I wanted to be that guy who people could go to and find the right answer."

Paul has commissioned multistory buildings, sports facilities, clean rooms, quarantine rooms, locomotive refueling and workshop facilities, co and tri-generation plants, and performance tested air handling units, cooling towers, chillers, boilers, generators, and many other types of plants. He even had a sweet job of partially redesigning and recommissioning a chocolate bar manufacturing machine!

In a recent New York Times article, "… the new U.S. Embassy compound in Madagascar, that includes high-efficiency windows and low-flow toilets, received certification as a green building. Taipei 101, one of the world's tallest skyscrapers, also earned a green stamp of approval recently as did the Seoul Finance Center in South Korea. As companies and governments look to burnish their environmental credentials around the world, many are devoting extra time and money to certifying their buildings as green."

"NEBB has had an influence on the U.S. State Department projects for a very long time because NEBB continues to focus on the proper ethics and maintaining the quality of their programming," says Clyde Porter, CEO and president of Porter Testing Services, U.S.A. "NEBB has the personal touch throughout the association and that is why we are as strong as we are now." Clyde has done work at the Marshal Space Flight Center and all over the world. The young engineers who work with Clyde, in the foreign countries he's been in, want to emulate his work. "That's what makes NEBB desirable in the countries I work in," Clyde says. "To see the NEBB influence grow around the world is neat. One of the reasons I joined NEBB is the fellowship and the fun of being part of an organization where you are personal friends with all of the professionals and because you are personal friends you work together really well. We all want the same thing."

"At the end of the day, we are all facing the same problems and NEBB is a good forum to exchange ideas, listen to others, and learn," says Jean-Paul Leblanc, president Hydrauliques R&O Services Inc, Canada and current NEBB President. "Being NEBB certified was a goal to achieve for our company. We are all involved in delivering a quality product and everyone is participating in that process. NEBB certification helped us to implement a good work ethic among our forces. All of my employees are proud to work for a NEBB certified company."

"I feel that NEBB is an asset to me every day. My certification is not a piece of paper to hang on the wall. Certification is how I practice my professional life," Tarek says. "Joining NEBB gives me a strength when I offer my services to a client. Most of my clients know how hard a NEBB certification is to get and maintain. A good commissioning engineer needs to have knowledge of design, construction, installation, and maintenance in addition to TAB and commissioning"

"My certificate hangs with pride in a place, in my office, alongside my Associates Diploma and Certificate of Technology," says Paul. "There is a great deal to learn from the NEBB study course and the interaction of like-minded people at NEBB events. The Environmental Systems Technology book is the bible of our industry and sits on the selves of many intelligent people for a quick reference of what to do when that difficult problem arises."

NEBB establishes, promotes, and maintains high quality standards through certification of firms, professionals, and technicians throughout the world. NEBB also provides the proper ethics and the use of a consistent set of reporting forms insuring that TAB work is being done in a systematic manner producing documented test results that can be easily understood. Each project may require fewer or more forms and steps depending upon the TAB project goals and the system complexity.

"We are proud to be part of the NEBB family," says Andres Sepulveda, CEO of Commtech Commissioning Services in Madrid, Spain. "I wanted to have NEBB trained and accredited TAB supervisors and technicians in Commtech. I looked into the NEBB publications at U.S. Building Industry Exhibitions and was very impressed. That's when I decided to join NEBB. NEBB gives Commtech the resources of technology and information so we can do our jobs. We can TAB any building. All of our engineers have passed the NEBB certification exam so NEBB means a lot to us."

Commtech is the largest accredited TAB company in Spain and one of a very few in Europe. They've been involved with projects in North Africa, South America, and the Middle East. Because of Commtech's professional affiliations they can insure that all of the work undertaken on their projects are in accordance with NEBB's strict internationally recognizable commissioning codes, practices, and standards. "We are thrilled to be among the few NEBB accredited companies outside of the U.S. and Canada. Our methods, procedures, and instruments are in compliance with the demanding and high NEBB standards," Andres said. "For me and Commtech, being part of NEBB means the access to the building system testing and commissioning state of the art processes that garners the immediate full respect of the international building industry. Our Spanish customers are very impressed that Commtech holds an American-based accreditation—that proves our readiness to undertake any TAB challenge."

"NEBB provides all the training, documentation, technical standards, certifications required to accomplish your work at very high level of quality," said Jean-Paul. "NEBB makes the difference between a certified firm and the others in the market place. Education, training, certification, and above all, having a chance to meet and exchange ideas with other certified individuals/firms performing the same work in other market places in the country and in other parts of the world is important to us."

"For continued growth of NEBB they should try and create chapters in countries or regions in Europe," says Andres. "There is a big potential for NEBB growth in Europe. For example, there are many U.S. military bases in Europe who use the NEBB requirements. The TAB work on those bases has to be done by accredited firms using NEBB requirements. So, creating a demand to get more firms certified by NEBB, in my opinion, would not be difficult." Andres wants NEBB to continue doing the great job they are doing with publications, training, courses, and procedures. He says, "NEBB is an excellent association."

International organizations around the globe, through their programs and initiatives, valiantly try to improve the human condition by providing food, clothing, housing, education, medical care, water, support, and security to those who are less fortunate.

NEBB does the same thing by focusing on the betterment of the human condition by improving the living and working space for all individuals. As an international partner with their firms, the high standards and ethics of NEBB focuses on the support of the work done by their stakeholders all over the world with technology, processes, and procedures that assist the NEBB professionals to ameliorate and better the built environment. ■

About the Author

Bert Henderson, M.Ed., APR, is a consultant with AZS Consulting in Gainesville, FL, for sustainability, renewable energies, and did cutting edge "green" building product research with AZS. He is a national speaker in sustainability and writes and delivers professional training programs in sustainability, renewable energies, and "green" construction for building contractors, HVAC contractors, renovators, building officials, architects, professional engineers, building inspectors, interior designers, and homeowners in all aspects of energy efficient design and construction.

Bert is a retired Energy Extension Faculty with the Programs for Resource Efficient Communities at the University of Florida (UF) and was building science faculty for the Bushnell Center for Sustainability at UF.

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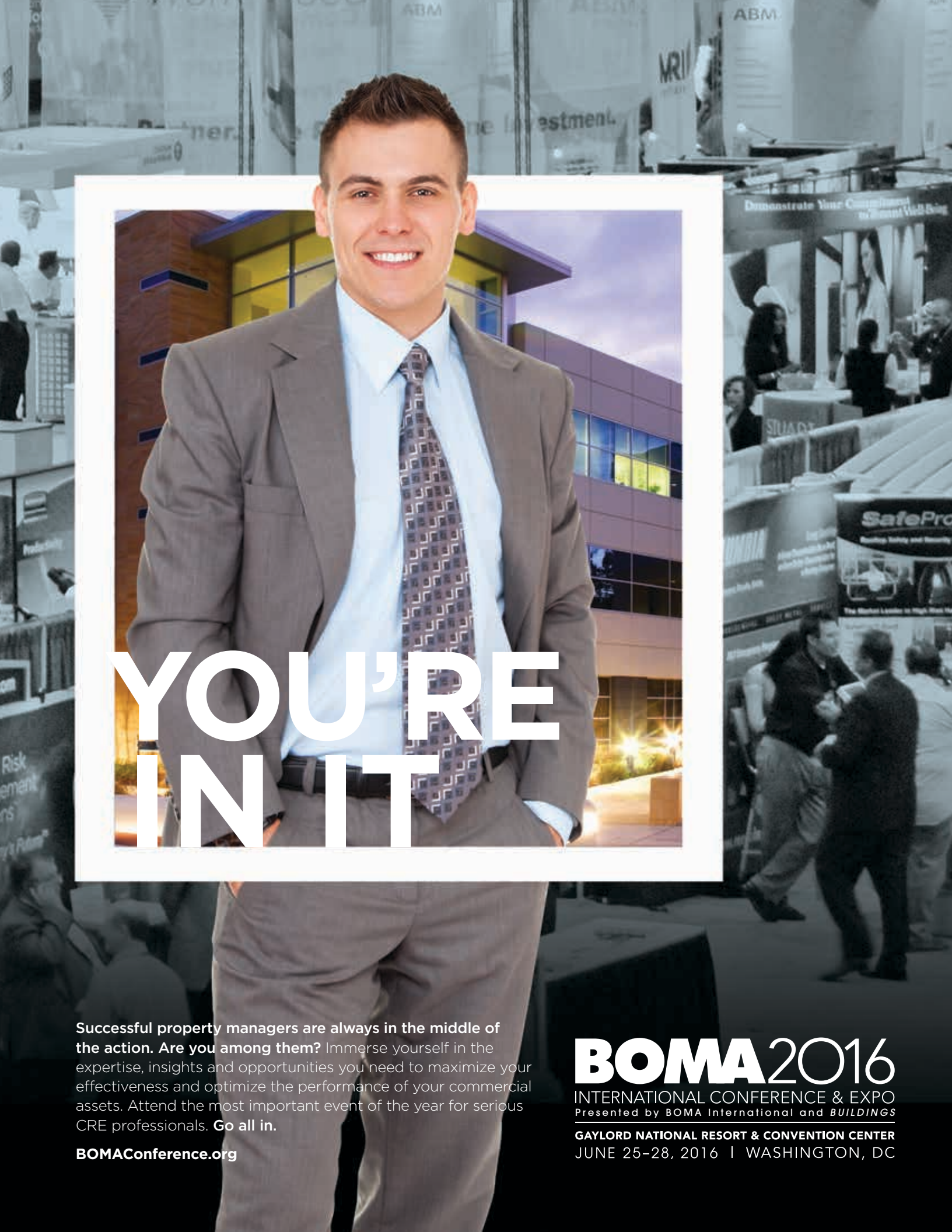

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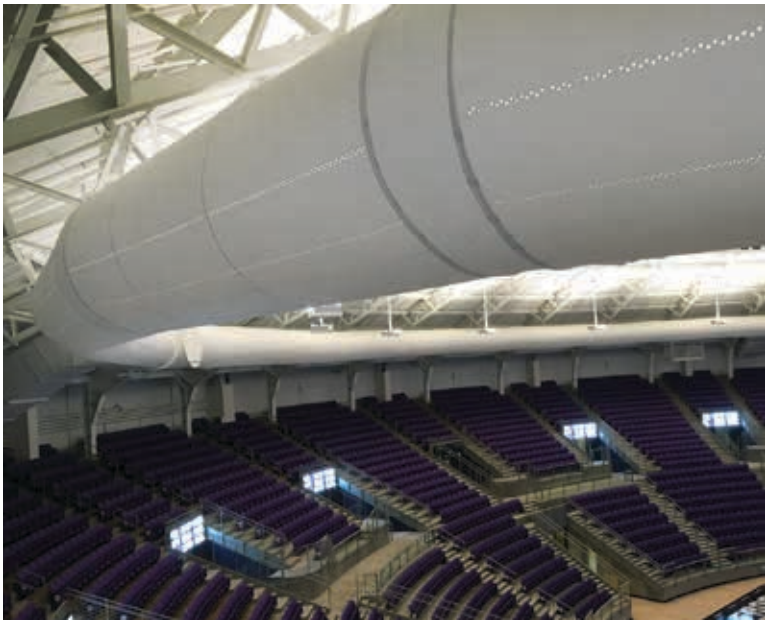
New Fabric Duct Technology

Kevin Gebke | DuctSox Corporation



Cylindrical In-Duct Tensioning System (CIDTS) at Texas Christian University
CIDTS now offer 50- to 84-inch (1,270 to 2,134-mm) diameters, the HVAC industry's largest interior tensioning system sizes for textile ductwork for large airflow distribution requirements in high-ceiling or high bay spaces such as athletic stadiums, convention halls, aircraft hangers, industrial buildings and other applications. It installs 25- to 50-percent faster and is 85 to 90 percent lighter than metal duct.

Fabric ductwork has been in the ventilation industry for decades, but it has emerged as a major air distribution strategy in the last 15 years.

More aesthetic fabrics, vent technology advances and improved hardware suspension systems and design have brought today's fabric duct air distribution options well past its predecessors that were once used only in food processing and other industrial applications.

Fabric duct has always been a plan/spec product specified by consulting engineers and manufactured strictly for a specific application. Besides industrial applications, it's most recent market share increases have come from retail, healthcare, office, education and other building categories that have helped the product surpass 15-percent of the open architecture ceiling market.

Most fabric duct is strictly for open architecture markets where it's fully visible and not recessed into ceilings, which doesn't comply with building codes.

Fabric duct is exactly what its name suggests: woven polyester fabric constructed into round ductwork for dispersing air handler supply air. Today's polyester weaves are superior to duct fabrics prior to 2000. These higher grade fabrics offer longer warranties and allow for porosity or non-porosity.

Non-porous fabrics rely strictly on factory-engineered, laser-cut vents or orifices for air distribution. The vents can come in any diameter, array or positioning to best satisfy the space's air distribution needs.

Porous fabrics allow approximately 15-percent of the air to flow through the fabric and provides a more even airflow. Porosity also keeps dust and debris from accumulating on top of a duct run, thus providing a cleaner environment. Porous fabrics also deter condensation, which can be problematic for un-insulated metal duct. Fabric duct does not require insulation or special coatings to prevent corrosion in wet, humid or corrosive environments.

Fabric duct offers many other advantages over metal duct/register systems:

- 90-percent lighter than metal;
- linear vent air dispersion distributes air without drafts and more evenly than metal register/diffusers every 5 to 10 feet;
- 40- to 60-percent faster to install and less expensive in labor;
- more streamlined and aesthetic than metal;

- easily cleaned with quick disassembly and commercial laundering;
- many times less expensive than metal in material costs;
- can't get dented from errant objects in athletic facilities.

Furthermore, fabric duct's superior airflow makes it more energy efficient than metal duct/register systems, according to a 10-month-long study performed by the Iowa State University's Mechanical Engineering Dept. "Thermal Comparison Between Ceiling Diffusers and Fabric Ductwork Diffusers for Green Buildings" proved fabric duct has a 24.5-percent efficiency differential, because it heats rooms faster and more uniformly to satisfy temperature set points versus metal duct/diffusers. This results in reduced mechanical equipment runtime, thus saving energy in the process. (The study is available free at www3.me.iastate.edu/bglab.)

Anti-microbial agents can also be added to fabrics destined for healthcare facilities to minimize any harboring of bacteria on the duct's interior or exterior surfaces.

Fabric duct is also available in standard or custom colors to match corporate logo colors. Silk screened logos can also be factory-applied and are very popular with sports facilities.

Installing Fabric Duct

Fabric duct light weight and suspension systems are one reason they're quicker to install. For decades, fabric duct has been installed on cable secured to walls or ceiling-mounted terminals. Once the cable is installed, hanging the fabric duct itself requires minimal labor time for stringing and hanging the duct along the cable run with clips and other types of connecting hangers. Ceiling-mounted U-track is also used for hanging and suspending duct runs.

Once strung along the cable or track suspension system, fabric duct lengths are designed to be zipped together.

Fabric duct offers nearly every type of fitting that metal duct offers. Elbows, Ts, reducers, etc., are all available.

Once specified by the engineer, the product is shipped to the contractor or directly to the site for assembly.

Revolutionary Cylindrical In-Duct Tensioning Systems

Perhaps the most revolutionary technological advancement in fabric duct the last five years has been the development of the cylindrical in-duct tensioning system (CIDTS).

This technology reverses fabric duct's only disadvantage, which is sagging and wrinkling during idle air handler periods and popping sounds during system start-ups as it rolls out and inflates.

The CIDTS is a game changer because it holds the material taut for a perpetual, inflated, wrinkle-free appearance. There are currently three generations of CIDTS offering different approaches.

The first CIDTS generation features 360-degree internal metal hoops every five feet that maintain duct roundness and minimize sagging and wrinkling. The hoops, which are supported by vertical cables tied into a horizontal cable suspension or U-track run, hold the fabric ductwork open and taut, regardless of air handler run times.

The second generation features 360-degree cylindrical supports attached to a central skeletal spine with a tensioning ratchet device. Instead of just internal hoops, the six-foot-long tensioning spine's adjustment nut is ratcheted on-site to spread the front and back support hoops apart. It is the most aesthetic generation because it keeps an inflated appearance and also smoothes the fabric to eliminate any wrinkling, thus giving a more streamlined appearance, regardless of air handler run times.

The third generation is a value-engineered variation utilizing a combination of tensioning baskets and internal hoops. It is suspended from either a cable or track suspension system. The tensioning locks, which connect the tensioning baskets to the suspension system, tighten and lock the fabric externally into a taut, smooth appearance, versus the internally tensioned, premium-grade aforementioned second generation.

One advantage of these CIDTS is they enhance variable frequency drive (VFD) applications. Previously, a traditional fabric duct system being supplied by an air handler motor running a variable speed of 40-percent, for example, might not measure up to intended aesthetic standards because the traditional fabric duct system would partially deflate. a partially collapsed duct run also might not provide the prescribed cfms for the application. A CIDTS retains the full capacity whether the fan motor is ramped down or not.

Besides aesthetics, the new suspension/retention systems have also extended warranties on fabrics. The fabric is the same quality, but the absence of fabric movement associated with hundreds and sometimes thousands of inflate/deflate cycles eliminates fabric fatigue. Thus, the fabric remains in a static position throughout its lifecycle. While many manufacturers offer warranties of up to 10 years on fabric with the older suspension systems, the new suspension/retention systems have extended warranties of up to 20 years, depending on the fabric grade.

(continued on page 26)

Commissioning Commercial Kitchen Ventilation Systems

Brady Ambrose
Manufacturer of Commercial Kitchen Ventilation Products

Modern Commercial Kitchen Ventilation System (CKV) manufacturers employ numerous new technologies and solutions to increase indoor air quality (IAQ), decrease hood exhaust requirements, and offer an economical and reliable hood system that will last the life of the restaurant. This article will discuss many of the newest technologies and commissioning methods for ensuring the best possible outcome for the end user.

Modern Design Features

Let's face it, historically hoods have been dirty, greasy, smoky, and a nuisance to restaurant owners and operators. They are energy hogs and maintenance burdens.

Modern manufacturers of CKV products have come out with many innovations in the past decade to resolve, if not eliminate altogether, many common failure points and frustrations in the standard commercial kitchen. Knowing how to implement these solutions correctly is imperative to obtain the optimal outcome.

In discussing equipment, the heart of the CKV system is the exhaust fan. A recent trend has been the use of direct drive fans. One major failure point historically has been the fan belts themselves, and the fact that as a belt wears, the fan RPM, and therefore the overall Cubic Feet per Minute (CFM), decreases. This results in an over-pressurized building which may have a hot or smoky kitchen. To resolve this issue, modern manufacturers are turning to direct drive exhaust fans. Direct drive fans are those which have the fan wheel directly coupled to the motor shaft, eliminating the need for belts, pulleys, and bearings. Direct drive fans come in many forms, from smaller permanent split capacitator motors (PSC) and electronicaly commutated motors (ECM) for 2 HP and below, to variable speed 3 phase motors for higher HP applications.

Exhaust fans exist to pull out the necessary air for a given set of appliances underneath a hood. What if the total CFM requirements could be reduced? One of the best methods for reducing the required airflow is to use a listed, engineered hood that is tested and labeled for much lower CFM than code requires. Additionally, the use of mechanical end panels can allow upwards of a 20% airflow reduction. These simple and economical design features can vastly reduce the total air required, eliminating roof top equipment and making the system economical, sustainable, and easier to setup.

On the hood controls front, Demand Controls (DCKV) for exhaust hoods and make up air systems are becoming increasingly more common, now over 1/3 of all packages sold by one of the leading manufacturers in the US. These systems offer the advantage of having a higher airflow capacity for peak times, with a turndown during off peak periods for energy savings. When coupled with direct drive fans, DCKV systems offer a major advantage for commissioning, allowing for all tuning of airflows to be performed in the space, a welcome feature during the extreme months of winter and summer. Many jurisdictions are now requiring the use of DCKV for jobsites with over 5000 CFM of exhaust, following the requirements set forth in ASHRAE 90.1.

On the fire prevention front, there has been an uptick in the use of self-cleaning and water-based fire suppression systems, which offer the advantage of cleaning the plenum and a portion of the ductwork on a daily basis. Although this does not directly impact the commissioning process, it does work to ensure that the system stays in clean, safe, and like-new condition. This is particularly critical for solid fuel hoods, which use wood or charcoal for their fuel source, as these appliances produce creosote which is a major fire hazard.

Ductwork design is moving toward the use of listed, factory-built ductwork systems. These systems offer the advantage of being significantly less prone to leaking. The ability to accurately know, during the design stage, what the static pressure will be is another major benefit. They offer a weld-free and fire wrap free installation process when ordered for zero clearance to combustibles.

Lastly, the most recent trend has been the use of remote cloud-based monitoring systems for real-time hood operation, amperage, speed and functionality verification. As sensors become less expensive, the economics of monitoring all aspects of the CKV system in real time are so favorable that it simply doesn't make financial sense to not have it. Using these modern systems one can set up the

kitchen during commissioning, and then check up on the kitchen remotely over the long term. When an issue arises, the technician can be the first to know and the first to solve, leading to higher customer satisfaction.

As described above, there have been many innovations on the CKV market in recent years. When used together as an integrated system, the entire operation can be expected to provide ideal indoor air quality with significantly improved energy consumption.

Commissioning

Before any measurements are taken, the first steps should be to ensure that all control wiring and the engineer's sequence of operation for the kitchen are in place. It is common for engineers to specify items such as Roof Top Units (RTU) to provide a sizable portion, if not all, make up air requirements for a commercial kitchen hood. Unfortunately it is also common for the same equipment to be set up on a wall thermostat and not electrically interlocked with the hood system. It is not hard to see that a hood will not perform as intended if it doesn't have the air available for exhausting. RTU thermostats are often set in blower "ON" mode, thinking that this is sufficient. The reality is that the user will think that switching to blower "AUTO" mode will save them energy, not realizing that this will instead result in a severely negative building and poor IAQ. It is highly recommended that all RTUs be electrically interlocked, via physical wiring, with the hood control panels to ensure that all available air will be there when the hoods need it.

Assuming controls are in place and wired properly, the next step is to make sure that all filters are in place and clean. A common failure point in the test and balance process is to take measurements with dirty hood or make up air filters. All building filters should be as-new, including the RTUs. Additionally, if the hood was engineered for the use of mechanical end panels, these must be installed prior to airflow measurement.

If the jobsite has dedicated direct fired make up air units, startup of their natural gas systems should be performed prior to test and balance. Although the equipment is set up from the factory for most models, jobsite specific gas pressure, elevation, and other factors can result in poor performance out of the box. Setting of the pilot flame, low fire, and high fire are all critical items for long term customer satisfaction.

After confirmation of the above, the building should be brought to operating temperature. A building tested at the wrong overall temperature will give false readings. Bringing equipment up to operational temperature is a major element in this process. Hood readings without appliances running can result in significant differences in actual exhaust airflow. Hot air is less dense, and therefore an exhaust fan will move more air than necessary when adjusted without the appliances on. Obviously safety is a concern when attempting to measure a hood with appliances running, therefore caution and common sense should be taken into account.

With all of the above in place, proceed to measure the hood and make up air system. Modern hoods use filters of various sizes and shapes. Each filter will have its own K-factor, or adjustment, for the measurement device utilized. If you are unsure of the K-factor for your hood filters and the measurement device, consult the manufacturer of the measurement equipment or the hood supplier for guidance. When taking measurements with a vel-grid style device, be certain to adjust your numbers for the actual exposed filter size, not the nominal filter size.

If the hood filters are not of a high efficiency type, and the hood has more than one exhaust riser or more than one hood is sharing a single fan, balance dampers may be required in the exhaust ductwork.

Measuring modern make up air delivery devices can be a bit more challenging. The delivery devices themselves vary by manufacturer, however the most common type are the perforated supply plenum (PSP) variety, which vary significantly in overall dimension. The delivery velocity, in feet per minute (FPM), from these devices is critical. Too high or too low of a velocity and the make up air will disperse through the space, resulting in higher utility bills for the end-user. For common 24" tall canopy hoods, the velocity target should be 140 to 160 FPM. For taller 30" hoods, a target of 165 to 185 FPM is ideal. Note that readings will vary summer to winter as the temperature of the air affects how it falls. Tuning the individual dampers on a PSP is critical to ensure that no one section of the make up air device delivers air at a higher velocity than the other sections. A make up air duct traverse is also a valid method of measurement of total airflow, however setting the individual velocities at the PSP is still a requirement for proper operation. This is even truer when a single make up air device is delivering air for more than one hood system.

Roof Top Unit outside air dampers are another critical element in the air balancing process. Although each manufacturer will have a unique method for setting the outside air damper, either on an economizer controller, through integral controls, or through a 0-10v damper, under all circumstances it should be confirmed that when the hood is on, the RTU is also on and the damper is open to the appropriate position. This is the most common failure when balancing a commercial kitchen. Additionally, RTU air delivery, if through four-way diffusers or similar, should be kept as far away from the hoods as possible. RTU returns should also be far away from the hoods, and ideally not in the kitchen space at all as that makes them prone to collecting the

odors and effluents of the kitchen and distributing them through the space.

RTU economizers should be avoided if possible for RTUs dedicated to the kitchen space, as they impact the localized balance of the kitchen. Some jurisdictions will not allow the removal of economizers, making the placement of the diffusers even more critical.

The velocity of individual RTU diffusers in the kitchen space is critical. The diffusers should have a flow that does not exceed 50 FPM velocity at the height of the bottom of the hood. For most diffusers, this means 250 CFM or less.

After taking your measurements, proceed to adjust to design conditions. If using direct drive fans, adjustments can be made in the space directly on the hood controls, or using dials on the fans. Re-measure and adjust as necessary, making note of the fact that a major adjustment in the building pressure, such as a swing from highly negative to slightly positive, will shift the readings significantly. It is wise to take a final set of readings after all adjustments have been made to confirm that the original measurements are still valid.

After all adjustments have been made to meet the specifications of the client, log and report the information to all necessary parties. It is important to bring any deficiencies to the attention of the general contractor or jobsite supervisor for immediate remedy, as most issues that exist when the building turns over to the end-user are never resolved. Solving them now will save numerous headaches down the road.

Future Challenges

As technologies evolve, energy codes become increasingly complex, and manufacturers are shooting for ever more efficient systems, the integration of equipment from the factory becomes ever more important. Just as an old shade tree mechanic has been replaced by modern factory dealership maintenance systems in the automotive world, in the CKV world, factory certified and trained technicians, building management integrators, and knowledgeable test and balancing firms will become increasingly more critical to ensuring a proper outcome. Monitoring of these systems will weed out players who cut corners, leaving only those with attention for detail and a focus on the end-user.

Commercial Kitchen Hoods

By Olaf Zwickau, Air Solutions & Balancing

As a TAB Professional, having been involved in the commercial kitchen ventilation industry for 25 years, I have seen the industry change dramatically on the balancing side as well. With the introduction of high tech kitchen hood energy management systems and the increasing use of variable frequency drives for both hood fans and the HVAC roof top units, the process of testing, adjusting and balancing is no longer a walk in the park that can be done by an inexperienced TAB technician. The proper balance of air pressure within the restaurant or commercial kitchen has become a science that cannot be taken lightly. When considering the many variables of keeping a proper building pressure during the ever changing restaurant environment, such as after hour unoccupied times compared with occupied times and varying speed of the kitchen hood fans, the overall store balance has to be well engineered and executed by both the design team and the TAB Professional. Today's retail and restaurant owners are energy and technology savvy and expect perfection in all areas. When their space is not perfectly balanced all the time, it will most certainly affect their customer's comfort, which in turn affects their bottom line. We as the NEBB Certified TAB community must be vigilant in performing top notch service using technicians who understand not only the engineering behind the space, but can properly adjust the balancing of a facility with a commercial kitchen hood. ■

Cut Score Certification

Cynthia Hereth | NEBB Director of Certification

Debunking the 70% Myth: Cut Scores and NEBB Exams

Over the past months, a consistent question I've encountered within NEBB focuses on exam passing scores. The belief is the passing score for all NEBB written certification exams is 70%. While once true, no longer is that the case. Appropriately, that begs the following questions: "How, why and when was 70% selected as the standard exam score for NEBB written exams?" and "How are exam scores determined today?"

Uncovering the History Behind 70%

A bit of investigation uncovered one reason behind the rationale of setting 70% for NEBB exams. According to Jim Bochat, Commissioning Concepts, Past NEBB Board Chair and NEBB volunteer since 1975, "Back then, there was no scientific reason for the 70% other than leadership at the time thought that was what everyone strived for a passing grade." However, in the educational realm, 70% equates to a C level which is a marginal passing grade and does not denote higher achievement.

"A C level is what they looked for back then, which was the minimum level for entrance into the program," said Bochat. "In hindsight, arbitrarily setting a score is not really the correct method to evaluate an individual's capability, especially since exam questions were not well vetted."

Changing Times

Times change, as did how NEBB leadership viewed its certification exams. The realization hit: to have an exam passing score determined properly, the exam questions had to go through a proper scientific review, complete with psychometric analysis and Angoff scoring. The cut score (passing score) then would come from the full analysis - specific to each exam and the quality of its questions.

In late 2013, leadership moved to upgrade the process used to create written exams. Their intention was not to make NEBB written exams harder, but to better evaluate the minimum level of capability to perform the work while increasing exam quality.

The Angoff Scoring Method

An exam's passing score can't be decided arbitrarily; it must be justified with empirical data, and the Angoff Scoring Method was employed by NEBB for that reason. In plain English, the Angoff Method is one of several methods test developers use to set a standard cut score (passing score) using empirical data and is a widely used standard-setting approach in test development. In 2014, NEBB's Exam Writing Committee, working under the auspices of NEBB's Certification Board, began conducting a thorough analysis of its exams. [Side note: Many NEBB exams have been recalibrated and in 2016 more are scheduled for review and analysis, with the ultimate goal of having all NEBB exams analyzed and cut scores adjusted.]

The process begins by creating, reviewing, analyzing and vetting exam questions with Subject Matter Experts (SMEs) in the discipline. After that is completed, the Angoff Scoring method is employed. Relying on the SMEs who examine the content of each exam question (item), the process then predicts how many minimally-qualified Candidates would answer the item correctly.

The average of the SMEs' **predictions** for an exam question becomes its "predicted difficulty." The sum of the "predicted difficulty values" for each item are averaged across the Exam Writing Committee and items on an exam, and that becomes the recommended Angoff cut score.

"The process is time-consuming but ultimately provides NEBB with better, high quality exams," says Rick Farrington, NEBB Certification Vice Chair and past Exam Committee Chair.

Real-world Example

Let's say an exam developer must determine the passing score for a language exam that tests a person's ability to read French. Using the Angoff Method, the developer would employ a number of SMEs (in this case, French-language experts) and ensure they were properly trained on how to use the Angoff Method, as well as informed on the exam's purpose.

The French-Angoff SME Committee would then rate each test item (question) based on whether or not a minimally-qualified Candidate would answer the item correctly or incorrectly. Once the first round of ratings had been conducted, everyone on the Committee would be given access to the ratings of the other SMEs to compare how they scored a particular test item.

The SMEs would then rate the items again for a **second round.** This second rating gives SMEs the opportunity to review their initial rating of an item, and decide whether they might want to change their decision based on the expert judgments of the other SMEs. This second round of ratings would be averaged across the SMEs to determine the exam's final cut score.

Says Stanley Fleischer, NEBB Certification Board Chair, "Using the Angoff Method ensures that the passing grade of an exam is determined empirically, which is necessary for an exam to be legally defensible and meet the *Standards for Educational and Psychological Testing*."

Thus 70% is **not** the standard cut score for all NEBB exams, and moving ahead, exams will have different cut scores based off its Angoff score. This move will ultimately raise the level of professionalism and excellence for all NEBB Certificants - and the organization as a whole. ■

About the Author

Cynthia Hereth is NEBB's Director of Certification and has been in the non-profit association world for 30 years, specializing in certification, training and leadership management.

What to Say When the Going Gets Tough

Leonard S. Greenberger* | *Potomac Communications Group

NEBB affiliates are well aware of how customers can become angry, worried or suspicious; failing to listen when they describe what they want so you can offer the resolution they really need; offering solutions that address only the symptoms of the problem, rather than the root cause; a perception that the test and balance report you provided is inaccurate, or perhaps more expensive than they expected it to be.

If any of these scenarios sound familiar, then you also know how difficult it can be to reason with an angry customer. Or, for that matter, with an irate boss, an upset employee – or even a suspicious significant other. That's because when people are angry, worried, and suspicious, the normal rules of communication don't apply. NEBB and its affiliates conduct tests based on consensus standards and procedures. Their coin of the realm is accurate data that allows customers to make smart, informed decisions.

But when people are upset in some way, they stop caring about data and numbers and standards. They begin to act and react on an emotional level, not with the rational areas of their brains. In other words, they're **feeling** – not thinking. To break through the emotional barrier that goes up when someone is upset requires special skills and techniques derived from a science known as "risk communication." Those skills and techniques come into play when two specific conditions exist:

1. ***High concern.*** Someone feels a risk is being imposed on them. It can be a physical, emotional, or psychological risk. It's important to remember that the risk doesn't have to be real – it's enough that the audience perceives themselves to be at risk. The fact that you know you told a customer that a certain job would cost x number of dollars is immaterial. If the customer feels that she didn't get her money's worth, what you know doesn't matter.

2. ***Low trust.*** For whatever reason, the customer doesn't trust you. Don't take it personally. Lack of trust can exist for several reasons out of your control. For example, the customer may have had a problem in the past with a non-affiliated company. She may think you're biased. Very few people are self-critical or willing to admit mistakes. It doesn't help that the credibility of people in positions of authority, which includes service providers, generally has eroded over the years.

When these conditions are present, your goal as a communicator is to establish and maintain trust and credibility. Otherwise, you'll never be able to break through and win people over. In fact, when people are thinking and acting emotionally rather than rationally, trying to address their concerns by spewing a stream of facts often makes a bad situation worse.

Practice and Preparation Are Essential

Risk communication is a skill. As with any skill – acting or singing, playing chess or basketball – practice makes perfect. No singer or actor would go onstage without being fully prepared. Neither should a communicator. Here are some basic steps that will help get you ready for the next time you find yourself in a "high-concern, low-trust" situation:

- Think about how audiences judge whether or not you're a trustworthy and credible source of information. Research shows that most people judge this by asking themselves four questions:

    1. Are you caring and empathetic? This is the most important of the four questions, and the one that most people answer the fastest. The best way to make sure a customer finds you to be caring and empathetic is to apologize. Not necessarily for the work you've performed, but for making them upset and failing to understand their concerns. A personal story can also be effective. Moving away from customer inaction for a moment, let's say you need to lay off an employee? A good way to start is to tell a story about the time it happened to you (if you can).

    2. Are you open and honest? Never lie or deceive, of course, but you can be open and honest in other ways. If you took notes during your conversation with a customer, show her. And point out what you wrote about the issue at hand. If someone asks a

question you don't know the answer to, admit it. And then promise to provide an answer by a certain date – and deliver.

3. Are you dedicated and committed? A concerned, distrustful customer needs to know that you really want to help them. Tell her you'll do whatever is necessary to make things right – even if that may force you to take a loss on this particularly project. Word-of-mouth is so important that one unhappy customer can cost you significant business down the road. Think of it as an investment. It's also important to be available to an unhappy customer. Take their calls, or at least call back quickly. Or even better: call her.

4. Are you an expert? Don't assume a customer will think so. Make sure you're well prepared, and cite independent sources of information to back up what you say. (Which should sound familiar because it's the role NEBB-certified affiliates play.) Testimonials from other customers can be particularly powerful, especially those from other customers your unhappy customers might know.

Interestingly, research shows that most Americans perceive women to be caring, open, and dedicated simply by virtue of their gender – but not men. Men are only perceived to be experts. This "risk communication gender gap" suggests that all other things being equal, if you need to send someone to deal with an angry, worried, and suspicious customer, send a woman.

Non-Verbal Cues Reign Supreme

Research shows that in "high-concern, low-trust" situations, the non-verbal messages you send can be three times more powerful than verbal messages. So:

- Pay close attention to the non-verbal messages you send. People will decide whether or not you're caring, open, dedicated and expert more by your eyes, hands, posture, clothing, gestures and other non-verbal cues than by what you say. Here are some helpful hints:
  - Make good eye contact. If you look around, or side to side, or up and down, people will think you're being dishonest.
  - Keep your hands visible in front of you, ideally between your hips and shoulders. Don't put them in your pockets or fold your arms, because in high-concern, low-trust situations these gestures signal discomfort and aggressiveness.
  - Remove any barriers between you and your audience. Try not to speak through a screen door, for example. When you sit down, either in a customer's home or office or your own, sit in a chair across from her rather than on the other side of a table or a desk. (And if you're speaking to a group, don't stand behind a podium or table.)
- Practice, practice, practice. The best way to be ready for difficult questions or accusations from someone who's angry, worried, and suspicious of everything you say is to prepare. Be ready with your caring and empathy, and review the rules about non-verbal communication. My firm counsels clients to seek out a colleague, friend or spouse to ask some questions in a sort of rehearsal. I've always found that performing for someone you know is much harder than performing for strangers.

  Finally, we've developed a very simply formula for answering the most difficult questions from customers and others. It's called the C-A-N model:
  - "C" is for "caring and empathy." You have to demonstrate it right up front, again by apologizing or telling a story that demonstrates that you understand a customer's concerns.

In "high concern, low trust" situations, make good eye contact, make sure your hands are visible, and don't put anything between you and the person to whom you're speaking.

When answering a difficult question from someone who is angry, upset, and suspicious, start by expressing caring and empathy, then answer the question, and finally offer a next step such as scheduling a phone call or providing a website.

- "A" is for "answer the question." This is your "sound bite," the thing you want the customer to remember most. The answer should be relevant, positive and concise; something like, "We'll do whatever it takes to get this fixed to your satisfaction." Support it with testimonials and specific timetables if you can. And don't be afraid to repeat the answer more than once.

- "N" is for "next steps." This is your chance to show dedication. Provide your personal cell phone number and promise to return the call within 24 hours, or set a date for a follow-up meeting.

Very few people are natural risk communicators. Those who do it well – Ronald Reagan, Bill Clinton and Gen. Norman Schwarzkopf, for example – honed their skills over the course of years spent communicating with concerned, distrustful audiences. If you take the time to practice, prepare and rehearse, you'll be ready to communicate with trust and credibility even in the toughest situations. ■

About the Author

Leonard S. Greenberger, a partner at Potomac Communications Group in Washington, D.C., is the author of What to Say When Things Get Tough: Business Communications Strategies for Winning People Over When They're Angry, Upset, and Suspicious of Everything You Say. *He has trained hundreds of people in the skills and techniques of risk communication. He can be reached at lgreenberger@pcgpr.com.*

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Abstracts/Presentations Submission Period through September 2, 2016
http://tinyurl.com/CallforSpeakersNEBB-2017

IAQA 20th Annual Meeting
January 30 – February 1, 2017, Las Vegas
Submit a Session or Workshop proposal before June 8, 2016 at www.iaqa.org/IAQA2017CallforPresenters.

Do you have an organization where a NEBB Certificant could present? Please share any opportunities along with deadlines for your affiliated organizations: Email communications@nebb.org. The world needs to know about the NEBB difference – Expertise and Technical. Help us spread the word and help yourself boost your visibility and your career!

NEBB Annual Conference Recap: It's all about the Salsa - Red or Green?

By David Kirkham and Olaf Zwickau

Those in attendance at the 2016 NEBB Annual Conference were faced with making tough choices: Which technical sessions to attend? Which tours to take? Which vendor booths to spend the most time browsing instruments and services? And perhaps most perplexing of all, which type of salsa to add to the many flavorful dishes served throughout our stay.

Many of us had the great privilege of experiencing the sights, sounds and tastes of beautiful Albuquerque, New Mexico. Attendees and guests were able to enjoy its unique southwestern character via tours of Santa Fe, a historic park, a balloon ride or an exquisite winery. Conference attendance was strong, matching or exceeding figures from the last several years. The magnificent location and the conference as a whole reflected the event's theme: *Rich History – Bright Future*.

Our opening session keynote speaker, Thom Singer, set the tone for the conference by teaching attendees how to connect with people in a gadget-crazy world. His emotionally compelling story challenged all of us throughout the conference to not just look at the name badge at the stranger next to us and then gaze in the other direction. He guided us into a way to introduce ourselves with a handshake to our fellow conference attendees, and then follow up with a discussion, which could lead to a friendship or business connection.

This year the conference was divided into three tracks, with one of them being dedicated to business topics and the other two on technical subjects. This format was very well received and will likely be repeated at the national convention in Orlando, Florida, next year. Topics such as effective marketing, succession planning, employee engagement, contract negotiations, and business ethics were all well attended. The technical tracks were equally informative. Every NEBB discipline was well represented, so there was always a session to attend matching everyone's area of interest. The 90-minute presentations offered Continuing Education Credits applicable to re-certification.

Our current NEBB President, Jean-Paul LeBlanc, provided great insight into NEBB's accomplishments in the past year, and the organization's dedication to continuing on the path of assuring that NEBB professionals are recognized as exceptional in their industry. Past President Jim Huber affirmed this with his informative presentation on Title 24, and President-Elect Jim Kelleher provided a compelling and exciting vision for the future.

Vendor turnout was at a record high. Representatives from all aspects of industry relevant to NEBB provided exceptional insight into the latest in technology, current trends, and product developments. We are always grateful for their contributions and insight. Their dedication to our NEBB professionals is a valued and appreciated relationship.

The golf tournament is always a highlight of the annual conference and this year was no exception. TSI sponsored the tournament, and Sandia Resort was the chosen location. Fun was had by all and the weather was fabulous. "Perfect golf weather" was a frequently overheard comment.

Shortridge Instruments sponsored the Networking Luncheon. A feast of Southwestern cuisine provided an opportunity for attendees to shake more hands, make new friends, and invoke the theme of the conference.

The closing session speaker, Leonard Greenberger, wrapped things up by showing how effective communication is essential for project success.

At the closing ceremony, Leonard Maiani was presented with a plaque recognizing his years of service to NEBB and the industry. Leonard served for decades as a NEBB volunteer, and most recently as the NEBB Technical Director until retirement at the end of 2015. He assured us that he remains available for continued support, in his own unique and insightful way. Thank you, Leonard.

As weary bodies and tired eyes packed their bags and called for cabs to head home, it's safe to say that our national NEBB convention was a great success filled with rich history in Albuquerque and a promise of a bright future in our industry. Whether your primary profession is TAB or Cleanrooms, whether it is commissioning or Sound and Vibration or even building envelope or fume hoods or maybe even all of the above, we can all be assured that NEBB will continue to be the dominant leader in our industry with the most knowledgeable and best trained professionals in the world.

We look forward to seeing everybody in Orlando in the spring of next year. Mark your calendars…time has a way of creeping up on you. Kind of like the kick from that salsa!

NEBB President Jean-Paul Leblanc (left) presented ASHRAE Vice President James Vallort with a $10,000 donation toward ASHRAE research


The Hotel Andaluz provided a perfect setting for the Route 66 themed Get Acquainted Reception


Jim Whorton, Rick Farrington, Jim Kelleher, and Jim Huber enjoyed perfect golfing weather at the 19th Annual NEBB Golf Tournament, sponsored by TSI


Leonard Greenberger's keynote presentation was titled "Effective Communications for Project Success"


Past President Bob Cherrington presented 1st Place Awards to the golf tournament's winning foursome: Rob Radliff, Richard Jarvis, Mike Peak, and Brian Keller (not pictured)


Attendees lined up to see the latest products and instruments featured in the vendor Exhibit Area

NEBB Discipline Reports

NEBB Disciplines are supported by volunteer experts in areas of specialized high building performance. Each group is committed to continued growth and keeping NEBB Certification programs the GOLD Technical Standard in each specialty.

Building Enclosure Testing (BET) Committee

***Phil Emory*, Chairman**
Neudorfer Engineers, Inc.

The Building Enclosure Testing (BET) Committee has finally received some much needed help from NEBB volunteers. They recently held a seminar at the National Conference in Albuquerque and are looking forward to the addition of NEBB BET CPs. Always on the front lines of new information and regulations, The BET Committee keeps its eye on the global market and provides NEBB and the Marketing Committee insight and suggestions to improve NEBB BET CP status in the industry.

Cleanroom Performance Testing (CPT) Committee

***Patrick C. Law*, Chairman**
Hepatest, Inc.

The Cleanroom Performance Testing (CPT) Committee has BETA tested their latest CP exam and made necessary improvements. The results are encouraging. They are looking into the possibility of holding a seminar/exam in Asia. The CPT is always on top of current trends and regulations. Last quarter they were on top of regulations for compounding environments, and now they're making sure to keep current with recent changes to ISO-14644. They are incorporating that information into their Home Study Course as well as any necessary changes to the CPT Procedural Standards. This committee is outstanding at ensuring NEBB Professionals are at the forefront of the industry.

Fume Hood Testing (FHT) Committee

***Mike Kelly*, Chairman**
Air Filtration Management, Inc.

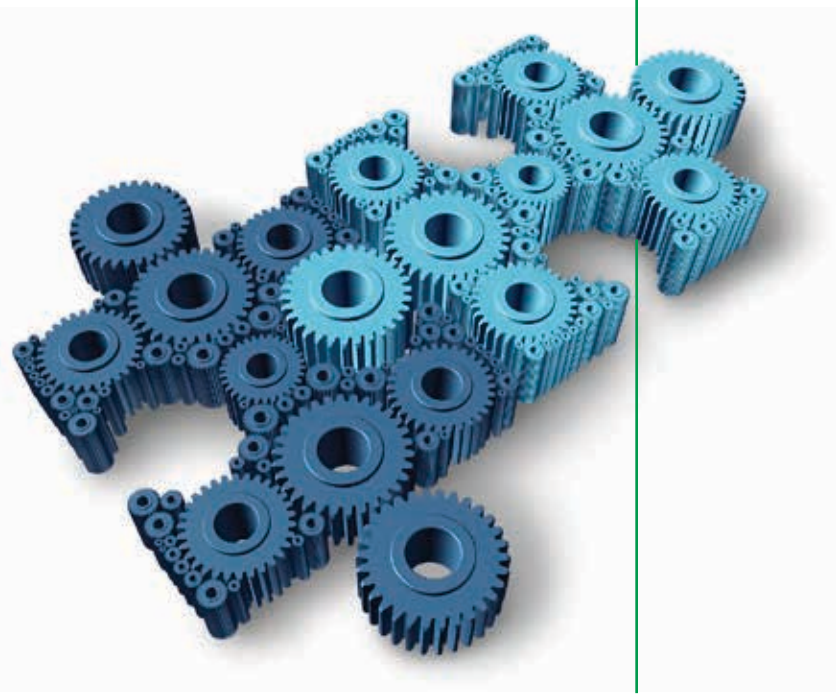
The beginning of 2016 has proven to be a busy time of change and planning for the FHT Committee including a successful transition of leadership responsibilities between former committee chairman, Don Fedyk, to the new chairman, Mike Kelly. The FHT members would like to thank Don for his time and dedication in leading this committee and wish him well in his new role within NEBB.

In mid-March the committee conducted the first of two FHT CP seminars scheduled this year. Both located in Kansas City, MO. The next seminar will be held on September 19-23. Further details can be found at www.nebb.org.

Over the next three months, the FHT committee will be focused on three main goals:

- Continue to work on the second edition of the FHT Procedural Standard incorporating changes from ASHRAE-110.
- Update the FHT CP seminar presentation to coordinate and address the revised Procedural Standard.
- Search and identify additional corresponding volunteers to build upon the committee membership.

Lastly, any individuals interested in volunteering for the FHT committee should contact Mike Kelly or David Muggah. Their contact information is on the NEBB website: www.nebb.org.



Reminder: Continuing Education Credits Required for Certified Technicians

A new policy requiring continuing education credits for Certified Technicians went into effect early 2016.

While CEC requirements were put into effect for Certified Technicians in 2015, NEBB Leadership made the decision to reschedule the full implementation program for early 2016.

The new 2016 CEC submission policy requires Certified Technicians to submit a total of 6 continuing education credits anytime within their 2-year cycle. In order to help with the transition of the new CEC requirement, there will be adjustments made for those CTs who are in the second year of their 2-year cycle. The schedule is as follows:

1. CTs who are in the **second year of their certification cycle ending December 2016** are required to submit 3 continuing education credits.
2. CTs whose certification cycle ends December 2017, are required to submit the full 6 continuing education credits.

CTs can submit CECs from a variety of continuing education credit categories that were designed specifically for them and include, but are not limited to:

1. Live or online NEBB or non-NEBB education events
2. Technical, community or college-related courses
3. Certifications/licenses
4. Safety training
5. Vendor lunch & learn events
6. In-house training events

Each CEC submission category has a detailed breakdown of eligible events, the number of CECs allowed and the required documentation when submitting to NEBB. The full Certified Technician CEC Submission Policy and Recertification Document can be downloaded at www.nebb.org.

"Continuing education is a win-win for everyone. It creates a more qualified, confident Certificant who can gain a competitive edge in today's marketplace, and improve their social and business network, "states Cynthia Hereth, Director of Certification for NEBB.

Throughout the transition process, NEBB's Certification Department will work with CTs who may have questions. Call Sheila Simms, Certification Manager at 301-591-0483 or Cynthia Hereth, Director of Certification at 301-591-0491.

New Subject Matter Experts "All Aboard!"

NEBB's Exam Development Committee, working under the auspices of NEBB's Certification Board, announced the appointment of 10 Certified Professionals as Subject Matter Experts/Item Writers for the various certification exams offered by the association.

The newly-minted SMEs represent the first "class" of CPs who were actively recruited by the Exam Development Committee for the express purpose of writing exam questions and assisting with exam development. SMEs were recruited by referrals from NEBB leadership, open recruitment, and also with assistance of Chapter Directors. All SME Candidates underwent an interview process and attended three weeks of training conducted through Go-to-Meeting sessions, combined with practical, hands-on assignments.

"These professionals are a hard-working group, representing diversity in geographic locations throughout the US and in business types," said Brian Keller, Exam Development Committee Chairperson. "It's been exciting to see the growth of our volunteer base with the new SMEs, and to have such great talent to draw from is definitely a boon to the Certification Board and the Exam Committee."

The new group of SMEs are currently hard at work, developing questions for the CxCT exam and refining a select group of questions for the TAB CP exam. All questions will then be vetted by the Exam Development Committee prior to being added to the exam.

"I am honored to have been selected as an SME and look forward to helping NEBB grow in the upcoming years," stated Nicholas Muscolino, LEED AP, Operations Manager, AERO BUILDING SOLUTIONS.

NEBB's new SMEs are as follows:

Mark Andrews,
TAB CP, BSC CP, Rcx CP, Andrews, Hammock & Powell, Inc., Macon, GA

Ryan Chang,
TAB CP, BSC CP, BET CP,
TAB Engineers, LLC, Kaneohe, HI

Brent Hahn,
TAB CP, BCS CP, BET CP,
Pacific Test & Balance, Inc., Aiea, HI

Richard Jarvis,
TAB CP, BSC CP, Rcx CP,
Precision Air and Water, Kalispell, MT

Ron Landberg, TAB CP, BET CP,
Rcx CP, MacDonald-Miller Facility Solutions, Seattle, WA

John Mazza, TAB CP, BSC CP,
Airpath,
Hauppauge, NY

Nicholas Muscolino,TAB CP,
Aero Testing and Balancing,
Franklin Park, IL

Mark Rusnock, TAB CP, BSC CP,
Precision Air Balance, Inc.,
Cape Coral, FL

Curtis Smart,
TAB CP, BSC CP, S&V CP,
Thermal Systems Balancing Inc.,
Melbourne, FL

Dave Wood,
TAB CP, BSC CP, S&V CP,
Fisher Balancing Company,
Williamstown, NJ

So You Want to Be a Subject Matter Expert?

One of the main 2016 goals of NEBB's Certification Board was to create and train qualified volunteers to become Subject Matter Experts (SMEs) to assist with exam item writing. Since February 2016, the CB has trained 18 SMEs, with an additional six SMEs specifically assigned to metricate exams, for a total of 24 volunteer SMEs actively working.

Being an SME is a great way to engage with the association and become involved, but for some, it could be an "acquired taste." Here are six criteria for deciding if you have what it takes to be a NEBB SME!

1. **They have the "secret sauce" recipe.** The best SMEs do something different than everyone else, and their work results in stand-out performance. SMEs are actually in the trenches doing the work you will be training on; they are not just managing the work.

2. **They can explain what they do and why.** It's not enough to be a top performer; the best SMEs are also able to walk you through what they do and explain the reasoning behind their methodology.

3. **They can break it down.** This is the tricky part. Often, when we become expert at something, we naturally develop an unconscious competence that makes it difficult to deconstruct our expertise. The best SMEs are able to break down complicated tasks and complex thinking processes into digestible chunks that a non-expert can understand.

4. **They are available.** The best SMEs are usually in demand because they excel at what they do. However, SMEs need to make sufficient time to be interviewed, answer follow up questions, and review or work on exam items.

5. **They are willing.** The best SMEs are not threatened by the prospect of sharing what they know—their "secret sauce" recipe. Rather, they are honored to be recognized for their expertise and excited to share their knowledge with their colleagues.

6. **They are patient.** Being a SME can be tedious. It requires intense thinking to break down actions that feel as natural as breathing and explain their process to someone else. To get an idea of just how tedious this is, think about breaking down in minute detail all the precise steps you follow to back out of the driveway. Are your eyes rolling yet? The best SMEs are patient enough to do just this without outwardly rolling their eyes.

If you're interested in learning more about becoming a Subject Matter Expert, check out the job description below!

Title: Subject Matter Expert

Purpose: Develop exam items (questions) that support the learning objectives of educational and exam products and/or job tasks identified by the bodies of knowledge for certification products.

Key Responsibilities:

- Participate on various SME item-writing teams
- Agree to participate in training sessions, held in the evening.
- When necessary, help to define the knowledge, skills and abilities required for Certificants to perform given responsibilities as requested by writing items for specified discipline exam
- Contribute to item writing
- Utilize source materials, reference items, and supplemental resources
- Add richness to the content by offering first-hand field knowledge (anecdotal stories, case studies, best practices, tips and/or "tricks-of-the-trade") that can be shared with others to improve knowledge exchange and transfer
- Consult on issues that occur during reviews
- Meet all agreed-upon turnaround times for deliverables, deliverable reviews, or deliverable sign-off

Qualifications (or selection criteria):

- Extensive knowledge of the content/topical area.
- Current practitioner in content/topical area
- Ability to bring day-to-day experience to the subject matter– both content and its context for the business.
- Ability to communicate to external audiences without using jargon
- Capacity to see the project through to completion

Time Commitment:

- The time commitment varies by project. The scope will be established (and reviewed with the Subject Matter Expert) at the onset of the project.
- Training/support provided:
- A project orientation.
- Guidance on the development process.
- Conference calls or online development meetings as necessary.

Benefits:

- Opportunity to define and validate the profession
- Ability to network with other Subject Matter Experts (SMEs) and NEBB Leadership.
- Gain recognition by sharing your expertise and taking your place among our profession's experts.

Contact: cindi@nebb.org

NEBB NEWS

NEBB Welcomes New Staff Finance Manager

Emily Demmons found her way to NEBB from Rickman Management in Rockville, MD, and their loss was NEBB's gain. An accomplished accountant with 18 years' experience in the finance world, Emily has her Bachelors of Science in Accounting, achieved her CPA in 2004 and is two courses away from obtaining her Masters in Business Administration (MBA). This staff member knows her numbers (and probably has yours too)!

While Emily enjoyed her job with Rickman Management, which dealt primarily with commercial property management, she found herself wanting to give back to her community. Her husband Kevin is an Emergency Medical Technician (EMT) so it was no surprise that when the non-profit Smithsburg EMS, which is part of the Washington County Fire and EMS Association, needed a Treasurer, Emily stepped up. She quickly found herself involved with all facets of the volunteer association, from general accounting and financial statement preparation for board members and county reports to budget prep and oversight.

"Because of my involvement with Smithsburg EMS, I realized how much I enjoyed working with volunteers and the non-profit atmosphere," said Emily. "I love all aspects of accounting, but I really get a kick out of problem solving the most. Some would call it Forensic accounting – where you dig in and find that one area that's not quite right. And when you find it, everything becomes clear!"

When Emily isn't digging around accounting files and ledgers or spreadsheets, you can find her simply enjoying life with husband Kevin and their two children, Wyatt (8) and Chloe (6). Feel free to contact Emily at her direct line, 301-591-0488 or emily@nebb.org if you have a question about invoicing, payments or just to say hello!

Welcome Emily!

Calendar of Upcoming Events

September

- **SEPTEMBER 25-26, 2016**
  MAEBA Recertification Seminar
- **SEPTEMBER 2016** (exact dates to be announced)
  NEBB RCx Certified Professional Review Seminar and Optional Exam
- **SEPTEMBER 2016** (exact dates to be announced)
  NEBB TAB Certified Professional Review Seminar and Optional Exam

October

- **OCTOBER 01-02, 2016**
  Mid-South Chapter Annual Recertification Seminar
- **OCTOBER 03-07, 2016**
  NEBB Cleanroom Performance Testing (CPT) Certified Professional Seminar and Optional Exam
- **OCTOBER 10-14, 2016**
  NEBB Fume Hood Testing Seminar and Optional Exam for Certified Professionals

November

- **OCTOBER 2016** (exact dates to be announced)
  NEBB BSC CxCT Seminar and Optional Exam
- **NOVEMBER 2016** (exact dates to be announced)
  NEBB BSC Certified Professional Seminar and Optional Exam

- NEBB Seminars
- Chapter Meetings

Please check the NEBB website for more details on training seminars dates and location. ***www.nebb.org***

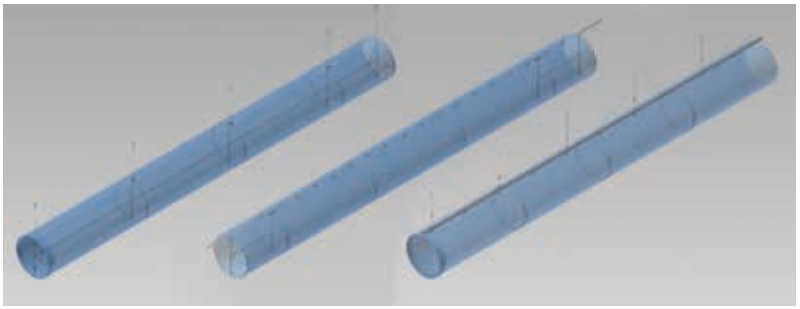


Figure 1 - Cylindrical Tensioning Device Comparisons
Three different methods of Cylindrical In-Duct Tensioning Systems (CIDTS) began with (right) 360-degree internal metal hoops every five feet that maintain duct roundness and minimize sagging and wrinkling. The hoops, which are supported by vertical cables tied into a horizontal cable suspension or U-track run. The second generation features 360-degree cylindrical supports (left) attached to a central skeletal spine with a tensioning ratchet device. Instead of just internal hoops, the six-foot-long tensioning spine's adjustment nut is ratcheted on-site to spread the front and back support hoops apart. It keeps an inflated appearance and also smooths the fabric to eliminate any wrinkling. The third generation (middle) is a value-engineered variation utilizing a combination of tensioning baskets and internal hoops. It is suspended from either a cable or track suspension system. The tensioning locks, which connect the tensioning baskets to the suspension system, tighten and lock the fabric externally into a taut, smooth appearance.

CIDTS have also caused a revolution in fabric duct design. Whereas 10 years ago a consulting engineer and architect would design a system by first picking the fabric type, color, air dispersion and then choose the suspension system (typically a cable or track system) last, the opposite has occurred today. Now the suspension system is the first choice because of aesthetics followed by the selection of other variables.

Fully Field-Adjustable Fabric Duct Systems

While the majority of fabric duct for open architectural ceiling applications are typically plan-and-spec products, another new industry innovation is field-adjustable, modular and configurable fabric duct systems that are fully-stocked and inventoried for three to five business days delivery. They're ideal for smaller non-plan/spec projects of approximately 3,000-square-feet or less. They offer equal, if not more, air balancing flexibility than conventional metal duct/register systems.

The systems can be purchased in various sections and accessories through manufacturer representatives. They are simple to design, 40- to 80-percent quicker to install and 15- to 50-percent less expensive than metal systems.

The product is designed for HVAC contractors with simple design-build heating/cooling/ventilating projects, such as retail strip center tenant improvement projects, commercial facility build-outs or floor plan reconfigurations, manufacturing/warehouse industrial plant retrofits, or any other open ceiling architecture application.

The systems consist of round 15, 5 and 1.5-foot modular lengths of white polyester-woven, non-porous fabric ranging in 5 diameters of 12, 16, 20, 24 and 28-inches that accommodate up to 6,000-cfm per run. The system's balancing is based on a two-foot-wide adjustable air outlet (AAO), or a four-orifice component, which can be zippered anywhere into the duct run and offers a variety of throw distances, volume and directional capabilities comparable to metal duct/register systems. The AAO and elbow have dual zippers for adjustable mounting orientation. The AAO can produce 4- and 8-o'clock directional airflow or 2- and 10-o'clock if mounting orientation is adjusted.

Supplementary components consist of an inlet collar, AFD (for damper and turbulence control), 90-degree elbow and end cap. Manufacturers also offer customer support, an installation manual, literature and online pricing/sizing guides.

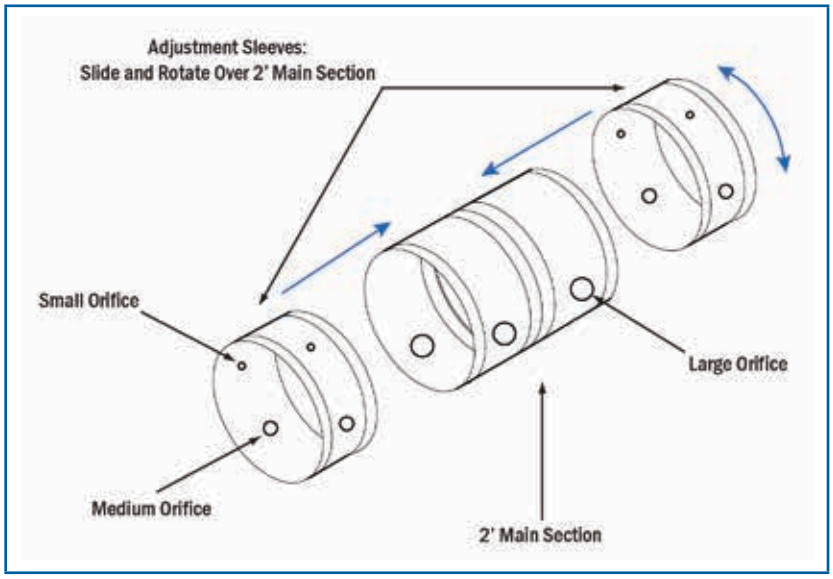


Figure 2 - AAO
The fully field-adjustable fabric duct system can be balanced with its two-foot-long adjustable air outlet (AAO), a four-orifice component, which can be zippered anywhere into the duct run and offers a variety of throw distances, volume and directional capabilities comparable to metal duct/register systems. The AAO has dual zippers for adjustable mounting orientation. The AAO can produce 4- and 8-o'clock or 2- and 10-o'clock directional airflow if mounting orientation is adjusted.

Balancing Fabric Duct

Plan-and-spec fabric duct may not offer the onsite balancing flexibility of metal duct/register systems, however most fabric duct systems may not require balancing at all. As a plan-and-spec commercial building product, consulting engineers specify fabric duct to meet the airflow, volume and velocity requirements of a particular project. If specified correctly, little if any balancing should be required, because of fabric duct systems' vent air distribution methods that are far superior in even air distribution to metal duct's registers and diffusers.

There are ways of adjusting flow with the adjustable flow device (AFD), a polyester-based factory-set or field-adjustable hemmed drawstring aperture. The AFD is designed for balancing airflow anywhere throughout a duct run, but is generally factory-set for the inlet to quell turbulence caused by the air handler or its connecting ductwork/elbows. It can be zippered into any part of the duct run where sections are adjoined with zippers. The AFD is available in sizes that fit duct diameters ranging from 6- to 72-inches. The AFD offers variable resistance to balance static regain, balance airflow to branches from trunk lines, straighten turbulence early in the supply run and reduce abrupt start-ups. When factory-set, AFD's included in the fabric duct system design shouldn't require field-balancing.

A general rule of thumb is an AFD can throttle as much as 50-percent of the airflow by cinching the drawstrings.

An AFD can be also be a helpful retrofit tool when balancing a duct run with airflow and velocity originally designed for a certain length that has been shortened, such as a space with a newly-constructed wall. The original end cap can be relocated and zippered into the new termination point followed by zippering in an AFD to balance the duct run's new length.

An AFD is also helpful in reducing the popping sound that sometimes occurs during air handler start-up as the fabric duct inflates. Zippering in an AFD ahead of the end cap at the duct run's farthest end can minimize the air rush and subsequent popping sounds.

Testing Fabric Duct Systems

The zippered connection between fabric duct sections also makes an excellent entry point for inserting a pitot tube for static pressure testing. Unlike metal duct where a hole must be drilled and then sealed, the zipper requires no drilling or sealing. The zippers only meet at the six o'clock position.

Nozzles

Another recent innovation that makes field balancing possible is the adjustable nozzle. Unlike vent orifices that are laser-cut into the fabric and offer no field adjustment capabilities, nozzles are field adjustable. They are constructed of a 360-degree rotatable hemispherical plastic diffuser secured inside a two-inch-diameter (33-cfm, 0.5-inch w.g.) or three-inch-diameter (66-cfm, 0.5-inch w.g.) grommet. They are designed to snap into the laser-cut orifice of a fabric duct trunk line.

Nozzles are ideal for any spot heating/cooling/ventilating applications, because they can be hand-rotated onsite into 10 different notched airflow angle settings including up, down, right or left as well as completely open or closed. The hemispheres have a throw range from 50- to 150-fpm and up to 10 to 70 feet, respectively.

The top three most popular nozzle applications are:

1. retail outlets--for directing airflow away from temporary ceiling-hung signage or non-dehumidified air away from supermarket freezer aisles;
2. industrial production lines--adjusting airflow per employee or for quality-control process preferences or indoor air comfort;
3. natatoriums--directing airflow and throw for complete window coverage and condensation control in difficult-to-reach corners.

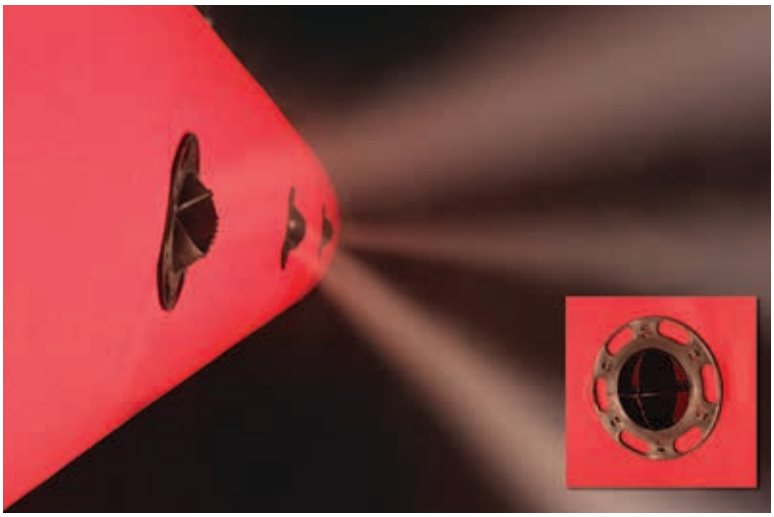


Figure 3 - DuctSox Adjustable Nozzle Inset
Nozzles are field adjustable 360-degree rotatable hemispherical plastic diffusers secured inside a two-inch-diameter (33-cfm, 0.5-inch w.g.) or three-inch-diameter (66-cfm, 0.5-inch w.g.) grommet.

Future Testing and Balancing Standards

Currently, testing and balancing standards don't exist specifically for fabric duct, although the category is a definite market force today in open architectural ceiling air dispersion. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 70, "*Method of Testing the Performance of Air Outlets and Air Inlets*"; ASHRAE Standard 120, "*Method of Testing to Determine Flow Resistance of HVAC Ducts and Fittings*"; and ASHRAE Standard 126, "*Methods of Testing HVAC Air Ducts*" are now in revision and their requirements will someday include fabric duct and its accessories.

The future points to more applications using fabric duct, because cost, labor, performance and aesthetic advantages outweigh its metal counterpart in commercial buildings. Testing and balancing contractors should become more familiar with the fabric duct product category, because applications will occur more frequently in the future as its popularity continues.

About the Author

Kevin J. Gebke is the New Product Development Engineer at DuctSox Corp., Peosta, Iowa, the leading manufacturer of traditional overhead fabric HVAC duct products in North America. Gebke holds a B.S degree in engineering from the University of Illinois, an MBA from the University of Dubuque, and has over 20 years of experience in HVAC air distribution, diffusion, and movement discipline. Gebke holds 12 patents and is active in ASHRAE. He's member and past chair of ASHRAE's Duct Design Technical Committee (TC) 5.2; member and current secretary of Room Air Distribution TC 5.3; current chair of ASHRAE's Method of Testing to Determine Flow Resistance of HVAC Ducts and Fittings SPC 120-2008R; current chair of Methods of Testing HVAC Air Ducts SPC 126-2008R; member of ASHRAE's Publications Committee; and author of the Textile Air Dispersion Systems chapter in the soon-to-be published ASHRAE Duct Design Guide. Gebke can be reached at kgebke@ductsox.com, LinkedIn - https://www.linkedin.com/pub/kevin-gebke/9/219/454.

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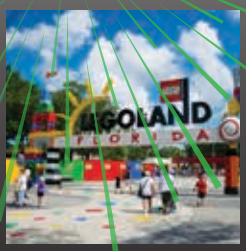



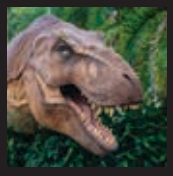
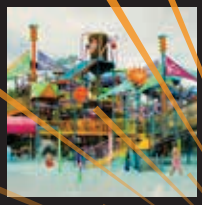


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