



Airflow Velocity Testing in Fume Hoods

By: Michael J. Kelly

As you should be aware, the first edition of the NEBB Procedural Standard for Fume Hood Performance Testing was released in March 2009. The NEBB Procedural Standard dovetails the new ASHRAE-110 "Method of Testing Performance of Laboratory Fume Hoods" which is due for release in the near future. The proposed ASHRAE-110 had been through peer review and minor rewrite



and is on its final leg to becoming approved. The current ASHRAE-110 specification was released back in 1995. As not all TAB firms perform the Tracer Gas

Containment and Airflow Visualization Tests, almost all firms perform the Airflow Velocity Tests. There are numerous changes that are implemented in the NEBB Procedural Standard that TAB firms should be aware of.

When testing the intake airflow face velocity, the operating intake opening area shall be divided into equal grids not to exceed 1 ft² with no dimension greater than 13 inches. A minimum of 20 readings must be sampled at a rate of 1 reading per second at each location and the average over that time is reported for that location. It is not required to report all 20 readings, only the average. The intake airflow face velocity is determined by averaging the average of each sample location. For VAV systems, testing is also required at 50% and 25% of the operational sash

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2011 MAEBA Educational Seminar

By: Trish Casey

Plans for the 2011 seminar are underway. We will be holding the 2011 MAEBA Recertification and Educational Seminar on September 11 and 12, 2011 at the Mount Airy Casino and Resort, in the heart of the Pocono Mountains.

Mount Airy Casino and Resort has spent millions renovating their facility into a casino and four star resort.

Back this year, golf on Sunday, September 11, 2011 at the Mount Airy Golf Club. Enjoy over 6,500 yards of rolling hills, tree-lined fairways, multi-



Mount Airy Casino and Resort

ple ponds, lakes, and streams, designed by the legendary architect Hal Purdy.

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2011 Educational Seminar

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Monday morning will begin with John Connolly, Safety Professional, discussing Driving Safety. This is an important topic for all NEBB Professionals and their employees. Brent Baird of Instrument Direct will discuss the review and application of Ultrasonic Flow Meters for balancers. This presentation is designed specifically for balancers. It will include a review of non-contact Ultrasonic Flow meters, theory of operation, installation, applications and what's new.

Andy Stadheim, P.E. from AiRNAB, will be speaking on "General Commissioning, Commissioning software and how it is tied-in with BIM. This will be a great introduction on how tying digital commissioning and the BIM world can help save time".

Michael Kelly of Air Filtration Management, Inc. will be discussing the NEBB Procedural Standard for Fume Hood Performance Testing. This presentation will cover the differences between the ASHRAE 110-1995 specification and the NEBB Procedural Standards (which dovetails the new, soon to be released version of ASHRAE-110). It will cover test procedures for Airflow Velocity, Airflow Visualization and Tracer Gas Containment Testing. The presentation will also include equipment specifications, reporting requirements and safety protocol.

**Instrument
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AiRNAB



AFM
Air Filtration Management, Inc.

2011 NEBB Annual Conference Coming to the East Coast

The NEBB Annual Conference is being held earlier than usual this year. The conference is being held on October 19-21, 2011 in Savannah, Georgia at the Hyatt Regency Savannah. As always there will be many fine technical sessions for attendees. NEBB will have their annual Get Acquainted Reception and tours set up for guests. Join us this year at the conference for a little southern charm and hospitality in a beautiful and historic city.



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height. Due to the restrictions of 1 sample per second and recording at a reduced sash height, using a velgrid or velprobe will not meet the NEBB specification. There are numerous hot-wire anemometers available that meet the specification. Additionally, the instrument must be held in place by a ring stand so as there is no influence by the technician performing the readings. Using a ring stand and taking exact dimension measurements for each location also allows for repeatability of the testing.

Testing is also performed for VAV systems to verify the speed of response and time to steady state. This is done by either placing the hot-wire anemometer in the rear plenum of the fume hood or in the exhaust duct. A baseline velocity is recorded and the sash is moved from the closed position to the operating height.

This is performed for 3 cycles. Readings are again recorded every second and will be required to be data logged. The speed of response and time to steady state for all 3 cycles shall be reported.

A major requirement of note for combination sash fume hoods, all testing shall be performed in both the vertical and horizontal sash configurations. This basically doubles the amount of time required to test combination sash fume hoods.

Neither the NEBB Procedural Standard nor the ASHRAE-110 Standard have any acceptance criteria for the airflow velocity testing. This must be agreed on by the owner and engineer. The manufacturers should also have input on this as well. The past rule of thumb was 100 FPM intake velocity. Some would even say "If 100 FPM is good, 150 FPM must be better". The turbulence that a higher intake airflow velocity causes in a fume hood and coupled with the amount of equipment in that hood has potential to cause the fumes to spill out and create a dangerous environment in the lab. In line with going green and saving energy, new fume hoods are currently being used that operate with an intake airflow velocity of 50 - 80 FPM. Most of these are designed with slots along the rear of the fume hood which creates a laminar flow from the front to the back across the work surface. These slots vary in size as engineered by the manufacturer.

It is also good practice for a TAB contractor to perform the Airflow Visualization Tests. This is a series of individual tests design to visually inspect the containment of the fume hood. All individual Airflow Visualization Tests are detailed in the NEBB Procedural Standard and are performed with inexpensive smoke emitting sources. Unlike the Airflow Velocity Tests, there is a pass / fail rating for this test. If under any circumstance the smoke source escapes the fume hood under any test procedure it is deemed as failing.

When reporting, it should be noted what the test state was of the fume hood at the time of testing. There are three (3) test states; "As-Manufactured", "As-Installed" and "As-Used". These test states are obvious as to their meaning. "As-Manufactured" testing occurs at the manufacturer's facility and the fume hood shall be void of all process equipment, apparatus and chemicals. "As-Installed" testing occurs when the fume hood is in its installed, operating condition. All supply, exhaust and return air systems are installed, operable and under control. The fume hood shall be void of all process equipment, apparatus and chemicals. "As-Used" testing is performed the same as "As-Installed" except the hood is being utilized for actual process work. Experiment equipment, chemicals and processes are being carried out inside the hood while the fume hood performance testing is being performed. This means that all normal operating equipment within the hood shall be activated and operational including items such as all heat and vapor producing appliances, physical obstructions, etc.





MAEBA Says Thanks and Welcomes a new President

Matthew Sano, the outgoing MAEBA President, has given much of his time to MAEBA and NEBB. Matt has served the MAEBA chapter as Board of Director, Technical Committee member, Technical Committee Chairman, Lead Proctor, MAEBA President, NEBB BSC Committee and NEBB Chapter Affairs Committee. Matt will remain on the MAEBA Board and Technical Committee and is still serving on the NEBB Chapter Affairs Committee. MAEBA wishes to thank Matt for his dedication to the chapter and NEBB over these past years and hope he continues to serve NEBB and MAEBA for many years to come.

The gavel has been passed to the new MAEBA President, Patrick McDonnell. Pat has been elected to serve as President for the 2011—2012 term. Pat has been on the MAEBA Board since January 1, 2007. He is a Project Manager and Estimator for West Chester Mechanical Contractors, Inc. Pat has a Bachelor of Science in Mechanical Engineering from Drexel University and is a U.S. Green Building Council, LEED Accredited Professional.



Matthew Sano (right) passing the gavel to Patrick McDonnell, new MAEBA President.

Safety Column - Eye Injuries

By: John Connolly

There have been many articles concerning the prevention of eye injuries in the workplace. But, if an injury does occur, quick and correct response can mean the difference between recovery and permanent damage to the eyes. Here is a summary of common workplace hazards/ injuries and the first aid procedures to treat them.



If you get particles or dust in the eye, do NOT rub it. Lift the eyelid outward and down over the lower lid and let tears wash out the particles. If that doesn't work, flush the eye with water until the material comes out. If that still doesn't work, or if there is pain or redness, bandage lightly and get medical attention.

For a chemical splash or burn, use emergency eyewash or flush with water for at least 15 minutes. Remove contact lenses. Call 911 or the workplace emergency number and make sure you know the MSDS for proper treatment. Symptoms of exposure to welding or lasers may not appear for hours. Symptoms include pain, gritty sensation, sensitivity to light and redness. Keep the eyes closed until getting medical attention.

An object penetrating the eye can be the most dangerous injury. If this happens, call for medical attention immediately and immobilize the object by putting a soft dressing around the object and securing it with a bandage. If the object is too small to immobilize like this, place a cup-type bandage over the eye and move the eye as little as possible. Place a bandage over the other eye; this will help to keep the injured eye still. Whatever the method, do NOT put pressure from a bandage, rub the eye, or take the object out yourself.



The key to avoiding eye injuries is prevention: wear your safety glasses! If you do sustain an eye injury, make sure it is treated promptly and properly.

An Overview of the New NEBB Professional's TAB Exam

Dave Wood – MAEBA Lead Proctor

As many of you may already know, NEBB has made significant changes to the TAB Professional testing process. It should be noted that the application process for becoming a Certified Professional has not changed.

The Written Exam portion of the test is now conducted completely online and on the date directed by NEBB. Laptop computers will be provided by MAEBA for this portion of the test. The test is no longer divided into the Fundamentals, Air and Hydronic sections. The exam is now organized as a single four-hour session. Unlike the old format, the whole test must be completed without the aid of any books or study materials. Candidates may only bring a calculator and a straight edge. Formula sheets and psychometric charts are provided by NEBB and are the only materials that may be utilized for the exam.



There are also several noteworthy changes to the practical portion of the certification process. One major change is the complete removal of the Air and Hydronics Oral Exam sections. Also of significance is the relocation of the Error Finding and Report Preparation sections to the NEBB website. Candidates will find a link to these sections on the NEBB homepage. They are completed online and may be taken at any time. No changes have been made to the Air and Hydronics hands-on sections of the practical portion. These sections will be completed at a site and time to be determined by MAEBA.

Please feel free to contact MAEBA with any questions that you may have about obtaining the TAB Professional certification.

Hopefully this brief overview has brought some clarity to your understanding of this new procedure. As previously stated, this procedure is still in the process of being implemented for the first time, so the Technical Committee will be better equipped to address any concerns in the coming months.

Since the exam is completely multiple choice and submitted online, candidates will no longer need to show their work or list any equations that they used to obtain a solution.

Technician's Certification Exams Now On-line

Starting in 2011 the only way candidates will be able to take the NEBB Certified Technician Exam will be on-line. The implementation phase of the on-line testing program has been completed, and the Certified Technician's test is ready to use. The practical for technicians is no longer a requirement, this test is now included in the on-line exam.



The on-line exams will be a continuous session of three hours. Candidates will make application through the Chapter and the exam will be administered by approved proctors and will be given on an approved computer. Candidates will have three years to complete the certification process. The test results will be collected by the Test Administrators and results will be forwarded to the local Chapter.

In May, 2009, the NEBB Board established a requirement that all NEBB Certified projects in the year 2012 and beyond shall be manned on-site by a NEBB Certified Professional or a NEBB Certified Technician to provide project supervision.

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When reporting, it is also good practice to include a room layout drawing which identifies walls, doors, fume hoods, other environmental enclosures such as biological safety cabinets, laminar flow hoods, exhaust chemical cabinets and the location of all air supply, return and exhaust grilles, registers and diffusers. This will document the actual room conditions and configuration at the time of testing.

The NEBB Procedural Standard for Fume Hood Performance Testing is both available for purchase and download from the NEBB website. An errata sheet will also be released once the proposed ASHRAE-110 specification is approved.



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**ASHRAE
Dinner Meeting**

April 13, 2011

Holiday Inn
4th & Arch Street
Philadelphia, PA

See MAEBA website for
registration information.

Calendar of Events

April 6, 2011 MAEBA Semi-Annual Meeting
MAEBA Auditorium Spring Mill Bldg.

April 9, 2011 Supervisors Practical Exam
Given Locally in MAEBA Chapter

**May 11, 12 & 13, 2011 NEBB Technicians
Seminar and Exam**
MAEBA Auditorium Spring Mill Bldg.

**September 11-12, 2011 MAEBA Annual
Recertification and Educational Seminar**
Mount Airy Casino and Resort

October 19-21, 2011 NEBB Annual Meeting
Savannah, GA

**November 7 - 11, 2011 Building Systems
Commissioning Seminar and Exam**
MAEBA Auditorium Spring Mill Bldg.

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