

54th
1958-2012



North Carolina Industrial Ventilation Conference

April 30-May 4, 2012

Clarion Hotel State Capital, Raleigh, NC

Optional Workshop-May 4

**New Topics in Industrial Ventilation-Combustible
Dust, REACH, DNEL, PM-2.5 and More!**

**Industrial Ventilation Design or Operation & Maintenance
Certificate Programs Available!**

North Carolina Industrial Ventilation Conference in cooperation with



University of North Carolina-Chapel Hill, School
of Public Health

North Carolina Occupational Safety & Health
Education & Research Center

NC Department of Labor, Division of Occupational
Safety & Health

NC Division of Public Health, Department of Health
& Human Services



54th Annual North Carolina Industrial Ventilation Conference

April 30-May 4, 2012 • Clarion Hotel State Capital • Raleigh, NC

INDUSTRIAL VENTILATION CONFERENCE

A new format, celebrating our 54th year in the Southeast includes:

- An expanded review of the *Physics of Air* with a more in depth look at all of the properties that affect the problems facing today's designer and regulator.
- How to design systems where temperature and moisture may be present.
- How to use the *Perfect Gas Equation* to look at non-standard gas streams like products of combustion and VOC's.
- More detailed look at the fan and how it is specified and analyzed.
- New courses in *Industrial Hygiene* basics as well as an introduction to *Maintenance and Monitoring* of industrial ventilation systems.
- A basic primer on the skill set needed by today's designer, operator and regulator of air system design.

ELEMENTS OF THE PROGRAM

CLASSROOM SESSIONS — April 30-May 3

The instructors for each class are chosen for their knowledge of practical problems and applications and the ability to teach. Classes are conducted on an informal basis in what is sometimes called "guided design." The problems represent real world situations and are sequenced in a manner to take advantage of skills that the students acquire. Instructors are then free to circulate around the class assisting in various ways with individual questions and concerns.

In order to facilitate computations in the problem sessions, students are required to bring a calculator.

NEW TOPICS IN INDUSTRIAL VENTILATION—MAY 4

The optional workshop on New Topics in Industrial Ventilation will bring together experts from all of the respective disciplines in order to give the student perspectives on areas as follows:

COMBUSTIBLE DUST:

- Process Hazard Analysis
- Ventilation Issues
- How do I handle the data?

CURRENT ISSUES IN VENTILATION

- REACH-Registration, Evaluation & Authorization of Chemicals
- DNEL-Derived No Effect Level
- Control Banding of Chemicals
- Low Level Sampling
- Low Level Emission Testing
- PM-2.5
- Nano Particles
- Assessing Efficiency

A question and answer session will follow the seminar.

VENTILATION SYSTEM DEMONSTRATION

The conference has ventilation systems that are used for demonstration purposes. These systems consist of ductwork, various hoods, variable speed centrifugal fan, stackcaps, and sound attenuators. The units can be modified to employ various hood shapes (plain, flange, conical, bell mouth), as well as to illustrate so-called "fan system effects," and converted from single to multiple hood configuration. Measurement capability with each system includes: pitot tube traverse to determine flow rate, hood static pressure, duct pressure drop, and simulation of fan and system curves. The Monitoring & Maintenance Section also uses a demonstration lab to learn and apply basic troubleshooting skills.

FOUNDERS BANQUET

Is held Monday evening after classes and is an opportunity to meet people early in the week. Dinner will be served on the 20th floor of the Clarion, overlooking the city.

OPTIONAL INDUSTRIAL VENTILATION CERTIFICATE PROGRAM

The North Carolina Industrial Ventilation Conference in collaboration with the University of North Carolina, Occupational Safety and Health Research Center has established two Certificate programs in Industrial Ventilation. The Certificate programs are intended to recognize those individuals who have shown competence in industrial ventilation design or operation by successfully completing the program's requirements. Upon completion of the program an individual will be awarded a **Certificate in Industrial Ventilation Design** or **Certificate in Industrial Ventilation Operation & Maintenance**, and plaque from the University of North Carolina, Occupational Safety and Health Education and Research Center.

Program requirements:

- Successfully complete two levels of Industrial Ventilation Conference offered at the North Carolina Industrial Ventilation Conference. Each level will be four days in length. In order to successfully complete any level an individual must pass a quiz after each of the 7 modules per year (total of fourteen modules). Questions for the quizzes will come from lectures and classroom problem sessions during the Conference.

- The first (Basic) level is a four day course in applied industrial ventilation including Hood & Duct Design, Fan Basics, Introduction to Air Control Devices (Baghouses, Scrubbers, ESP's, etc.) and Basic Industrial Hygiene Issues and how they affect exposure and ventilation system design.

The student has a choice in the second year to continue with more detailed course in system design (leading to a Certificate in Industrial Ventilation Design from the University of North Carolina-Chapel Hill) or to pursue a course of System Operation Maintenance (leading to a Certificate in Industrial Ventilation Operation and Maintenance from the University of North Carolina-Chapel Hill).

The Basic Level is presented in seven modules of 4 hours. The second year courses will also be presented in the seven-module format and the certificate is provided to the student completing a total of fourteen modules. Attendance can be for any number of modules during any year (maximum seven at one Conference) and completion of the requirements for the **Certificate** can be accomplished within five years of beginning the program.

In order to enroll in the Industrial Ventilation Certificate Program an individual must complete and return an Industrial Ventilation Certificate Program Application. There is a one time \$150 fee to enroll in the Certificate Program and should be sent with the completed application.

For more information about the Certificate Program or to receive an application, please contact Connie McElroy-Bacon at (919) 233-8400 or go to the North Carolina Industrial Ventilation Conference web site at www.ncindustrialventilation.com. The application can be downloaded from the web site.

PLAN OF INSTRUCTION

There will be 3 levels of instruction during the 2012 conference.

Basic Industrial Ventilation Skills (7 Modules)

Basics of Ventilation and Industrial Hygiene I

Requires some basic algebra and math skills to solve problems such

as $Q = VA$, etc. This includes an introduction to flow and pressure in a duct system and how they can be measured. It also provides an introduction to the effects of density of the air stream and how it can affect duct sizes, hood design and selection of proper fans and motors. This course is a requirement for Certificate program. It also includes a primer on Industrial Hygiene coordinated with Industrial Ventilation Design.

Hoods & Duct I

The first in-depth course of its type looking at: hood classifications and types, nomenclature, capture velocities, air distribution over a large area (design of slots), hood "losses", air volume requirements for different hood designs, using Hood Static Pressure to monitor the system, present regulations and hoods (USEPA Method 204); includes simple problem sets to calculate hood flow requirements and losses and how this impacts the horsepower and energy in a system. Also includes skills to size and design duct components.

System Design I

This topic continues the in-depth look at the primary components that define the system size including the effects of static, velocity and total pressure, hood static pressure, hood and duct losses and a lab demonstration.

System Design II

Building on the skills taught in the first three modules, this course introduces the attendee to the use of the ACGIH Calc Sheet to design and predict the operation of a system, how to size a fan and calculate horsepower.

System Design III

A third module of system calculations building on previous modules and looking at temperature and other density effects and the design of system duct and fans.

Basic Air Control Devices

Known as "Dust Collector 101", this module introduces the attendee to the fundamentals of dust, mist and gas emission controls. Besides nomenclature and principles of operation, key factors such as air/cloth ratio, can velocity, efficiency calculations, pressure drop and other issues are discussed.

Fans & Systems Issues 101

The fan is the heart of the system requiring its own detailed treatment. There are problem sets to show how to select a fan at standard and non-standard conditions, evaluate fan and system curves, consider operation with VFD's (variable frequency drives) and how this can save energy.

Industrial Ventilation Design Option Courses (Seven Modules required for Certificate)

Prerequisite: for certificate program in Industrial Ventilation Design: Completion of Basic Level taken at N.C. Industrial Ventilation Conference.

Participants should be able to:

- Utilize *Industrial Ventilation Manual*
- Understand the velocity pressure method of design
- Utilize the ACGIH calculation sheet

Operation and Maintenance Option Courses (Seven Modules required for Certificate)

Prerequisite: for the Certificate Program in Industrial Ventilation Operation and Maintenance: completion of Basic Level taken at N.C. Industrial Ventilation Conference

- Utilize Operation and Maintenance Manual
- More practical applications with less math
- Requires calculator and some problem solving

Basics of Ventilation II

An intense review of BA-1-1, this module does a quick revisit of basic formulae of system design ($Q=VA$, Hood Static Pressure, Effects of Density), sizing of duct, system pressure, and calculation sheet review. This module is intended for attendees who have completed basic modules or have over five years ventilation design experience.

Basics of Ventilation III

This course covers basic psychrometrics, the perfect gas equation and sample problems explaining both concepts. Subjects include dry bulb and wet bulb temperature, dew point, enthalpy.

System Design IV

This module focuses on using the calculation sheet and techniques to solve problems involving non-standard air and mixing of hot and cold or dry and wet air streams.

Fans 201

This segment is a continuation of the Basic Fan module and focuses on system effects and issues that may impede operation. The module includes demonstration and practical problems to solve on fan system effects.

The Fan & System

The fan is the heart of the system and rates a third module covering noise, vibrations, fan selection at non-standard (high temperatures) conditions and VFD's and other methods to control volume and pressure.

Energy and Cost

Systems use large amounts of horsepower to convey dust and gases. This module provides the attendee with tools to calculate both the initial system costs as well as operating costs (power, maintenance, replacement air, etc.) and includes sample problems.

System Design V

This module will encompass stack design issues and system design with non-standard air and dilution ventilation.

Monitoring & Maintenance of Ventilation I

This module provides the basic insight into requirements including documentation, use of fan performance curves and system measurements to monitor operations. Minimal math required. .

Monitoring and Maintenance II

This module builds on the basic data gathering methods to provide hands on experience on system data comparing baseline information with changes that may occur over the life of the system.

Monitoring & Maintenance III

This module will cover extensive lab procedures to evaluate fan operation (fan and system curves) as well as effects of varied pressures during operation (i.e. baghouse delta-P, etc.) as well as an introduction to effects of changes in density on results of measurements.

Practical System Troubleshooting I

In this module, the participant will look at comparison data to evaluate the changes to a system over operation.

Practical System Troubleshooting II

This module is a continuation of the practical problem solving as systems are altered over their operational life.

Format

Monday, April 30, 7:30-8:00 AM Registration, Clarion Hotel State Capital, Raleigh, NC.
You may pick up course materials in the lobby anytime between 7:30 and 8:00 AM.

	Monday	Tuesday	Wednesday	Thursday
7:30-8:00 AM	Registration			
Basic Ventilation Skills				
8:00-12 noon	<i>Basics of Ventilation & IH</i>	<i>Basic Air Control Devices</i>	<i>System Design II</i>	<i>Fans & Systems 101</i>
12:00-1:00 PM	Lunch			
1:00-5:00 PM	<i>Hoods & Duct I</i>	<i>System Design I</i>	<i>System Design III</i>	<i>Ask the Experts-Open Forum (Optional)</i>
Advanced Design				
8:00-12 noon	<i>Basics of Ventilation II</i>	<i>Fans 201</i>	<i>Energy & Cost</i>	<i>System Design V</i>
12:00-1:00 PM	Lunch			
1:00-5:00 PM	<i>Basics of Ventilation III</i>	<i>System Design IV</i>	<i>System Design V</i>	<i>Ask the Experts-Open Forum (Optional)</i>
Operation & Maintenance				
8:00-12 noon	<i>Basics of Ventilation II</i>	<i>The Fan & System</i>	<i>Monitoring & Maintenance III</i>	<i>Practical System Troubleshooting II</i>
12:00 - 1:00 PM	Lunch			
1:00-5:00 PM	<i>Monitoring & Maintenance of Ventilation I</i>	<i>Monitoring & Maintenance II</i>	<i>Practical System Troubleshooting I</i>	<i>Ask the Experts-Open Forum (Optional)</i>

NEW TOPICS IN INDUSTRIAL VENTILATION

Friday
8:00 am-12 noon

Don't miss current topics in Industrial Ventilation discussed in this half day workshop. Topics to be covered are:

Combustible Dust:

- Process Hazard Analysis
- Ventilation Issues
- How do I handle the data?

Current Issues in Ventilation:

- REACH-Registration, Evaluation & Authorization of Chemicals
- DNEL-Derived No Effect Level
- Control Banding of Chemicals
- Low Level Sampling
- Low Level Emission Testing
- PM-2.5
- Nano Particles
- Assessing Efficiency

PROGRAM STAFF

ACKERSON, ROSS, Air Solutions, Inc., St. Louis, MO

BOSTON, KIRT, Donaldson Co., Minneapolis, MN*

BOYERS, ALBERT S., Dept. of Mechanical & Aerospace Engineering, NCSU (Retired), Raleigh, NC*

BUCKHEIT, KATHLEEN, N.C. Occupational Safety & Health Education & Research Center, UNC, Chapel Hill

CURRAN, PAT, NC Division of Public Health (Retired), Raleigh, NC*

GODBEY, THOMAS, Donaldson Co., Jeffersonton, KY*

GUNNELL, DOUGLAS L., Gunnell Engineering Services, Winston-Salem, NC*

GRESHAM, NEIL, Saint-Gobain Corp., Oxford, NC*

GRUBB, GREG, Michigan Dept. of Labor and Economic Growth, Lansing, MI.

HALE, JONATHAN, Air Systems Corp., Clemmons, NC*

HERRING, ROMIE, RH Consulting LLC, Raleigh, NC*

HOWARTH, BILL, Illinois Blower Company, Cary, IL

HUDOCK, REGINA, NC Division of Air Quality, Raleigh, NC

HUNTER, RAYMOND B., Ray Hunter & Associates, Birmingham, AL

JACKSON, W. CRAIG, Jackson-Hale Environmental Technologies, Clemmons, NC

JOHNSON, GARY, Workplace Exposure Solutions, LLC, Cincinnati, OH

KNIGHT, RICHARD B. JR., Durr Environmental, Bowling Green, KY

LANHAM, GERRY, KBD/Technic, Inc. Cincinnati, OH*

LOWE, ERIC, RL Kunz, Raleigh, NC

MARSHALL, BRIAN, The Kelly Group, Decatur, IL

MALETICH, DAVID, New York Blower, Willowbrook, IL

MCELROY-BACON, CONNIE, McElroy-Bacon Consulting, Cary, NC*

O'HARE, TIM, New York Blower, Willowbrook, IL

RAVERT, EDWARD, UAS, Cincinnati, OH

SORENSEN, ANDY, Donaldson Company, Inc., Bloomington, MN

STALLINGS, JEFF, Stallings Engineering, Winston-Salem, NC

SULLIVAN, PAUL, NC-OSHA, Charlotte, NC*

TRAMM, LEO, TRC, Milwaukee, WI*

*PLANNING COMMITTEE MEMBER

GENERAL INFORMATION

This conference was established to promote good ventilation practices and design techniques throughout industry and will help you learn to evaluate and/or design a ventilation system. Time and money are regularly spent for ventilation systems that do not perform satisfactorily. Information available in this course helps attendees to "get the job done" properly the first time and eliminate problems caused by improper design, installation, or maintenance.

Classroom problems will be solved using the so-called "velocity pressure method" of calculation. All participants will receive a copy of the appropriate current edition of the Industrial Ventilation Manual by the American Conference of Governmental Industrial Hygienists.

Classroom sessions and morning registration on April 30, 2012, will be held at the Clarion Hotel, 320 Hillsborough St., Raleigh, NC. Registration on April 30, will take place between 7:30 and 8:00 AM, with the first session beginning at 8:00 am. The optional *New Topics in Industrial Ventilation* workshop will be held on Friday, May 4, 8:00 AM.

TUITION

The cost for Level I Basics of Ventilation, Level II Advanced Ventilation Design OR Level II Operation and Maintenance is \$1,245 per person. The three levels are taught concurrently April 30-May 3.

Tuition for the optional *New Topics in Industrial Ventilation* workshop, May 4, is \$250 per person. Please call about company discounts for 3 or more conference registrants.

Conference registration fees include the most current copy of the appropriate ACGIH Industrial Ventilation Manual, all course materials (problems, calculations sheets), breaks, three lunches, and the Founders Dinner on Monday, April 30. The Friday workshop registration fee includes handouts and breaks.

Should you wish to enroll in a 2-year Certificate Program, there is an additional one time fee of \$150.

MAINTENANCE POINTS — The NC Ventilation Conference contains 26 hours of technical contact time and is eligible for ABIH CM credit. We estimate 3.5 CM points based on the technical content time and ABIH guidelines. The optional workshop contains an additional 3.5 hours of technical contact time and is eligible for ABIH CM Credit. We estimate .5 CM points based on the workshop content and ABIH guidelines.

PROFESSIONAL DEVELOPMENT HOURS (PDHs) — The Industrial Ventilation Conference (S-0213P) is an approved sponsor of continuing competency activities for North Carolina Professional Engineers and Registered Land Surveyors. Upon course completion, each qualified participant may receive Professional Development Hours (PDHs).

ACCOMMODATIONS — Rooms have been set aside at Clarion for participants of this conference, but their availability cannot be guaranteed past April 1. Lodging is NOT included in your registration fee. Please make your own reservation directly with the Clarion. To receive your special rate of \$79/night (plus tax), please state that you will be attending the **Industrial Ventilation Conference**. Guaranteed late arrival reservations are advisable.

CLARION HOTEL STATE CAPITAL
320 Hillsborough St.,
Raleigh, NC 27603 919-832-0501

PARKING — On-site parking is available for Clarion guests and conference attendees at no charge.

CANCELLATION — The full registration fee or an organization purchase order is due at the time of registration. If the Conference is canceled, full reimbursement of paid registration fees will be made. In the event the participant cancels, a written notice is required. A twenty-five dollar (\$25.00) fee will be charged for cancellation 4 or more days from the start date of the program. No reimbursement can be made if cancellation occurs within 3 business days of the program, or if the participant fails to attend. Substitutions will be accepted.

OTHER CONFERENCES — The Birmingham Industrial Ventilation Conference will be held October 2012. For information please call (520) 621-4007. The 61st Annual Industrial Ventilation Conference will be held in Michigan in February 2012. For information please call (517) 322-1133.

Registration Form

54th N.C. Industrial Ventilation Conference

Clarion Hotel State Capital, Raleigh, NC

April 30-May 4, 2012

Name _____

Job Title _____

Firm/Org. _____

Work Phone _____

Fax _____

Address _____

City _____ State _____ Zip _____

E-mail _____

PLEASE CALL ABOUT PRICE BREAKS FOR 3 OR MORE REGISTRANTS!

Payment must accompany registration

Payment Method:

Visa MasterCard AmericanExpress

Check (Make check(s) payable to: Industrial Ventilation Conference) PO

Card Account # _____

Exp. Date _____

Three (or four) Digit Security Code on Back of Card _____

Amount \$ _____

Signature _____

Cardholder's Name (please print) _____

Credit Card Billing Address _____

City _____ State _____ Zip _____

Mail to: Industrial Ventilation Conference

P.O. Box 37129

Raleigh, NC 27627-7129

Attn: Connie McElroy-Bacon

For Information:

Phone 919 233 8400

FAX: 919 852 4594

E-mail: cbacon@mindspring.com

Please choose one level. Sign me up for:

Level I-Basics of Industrial Ventilation \$1,245

Level II Advanced Vent Design \$1,245

Level II Operation & Maintenance \$1,245

Enroll me in the New Topics in Industrial Ventilation Workshop
May 4 \$250

Enroll me in the certificate program \$150

Total \$ _____

**North Carolina
Industrial Ventilation Conference**

P.O. Box 37129
Raleigh, NC 27627-7129

Visit our Website:
www.ncindustrialventilation.com



April 30-May 4, 2012

Clarion Hotel State Capital, Raleigh, NC

Certificate Program Available!

Industrial Ventilation Design or
Industrial Ventilation Operation & Maintenance

New Topics in Industrial Ventilation Workshop

May 4
