

THE UNIVERSITY OF ARIZONA®
College of Engineering

Presents

29th Annual Birmingham Industrial Ventilation Conference

October 15–17, 2007

Oxmoor Inn

Birmingham, Alabama

and

7th Annual Fan System Maintenance & Troubleshooting Workshop

Maintaining Plant & Facilities Ventilation Systems for Proper Contaminant Control

December 3–5, 2007

Circus Circus Conference, Meeting & Convention Facility

Las Vegas, Nevada

The University of Arizona
Engineering Professional Development
29th Annual Industrial Ventilation Conference
& Troubleshooting Workshop
7th Annual Fan System Maintenance
1224 N. Vine Avenue
Tucson, AZ 85719-4552

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29th Birmingham Annual Industrial Ventilation Conference

October 15 – 17, 2007

Conference Overview

The purpose of this conference is to teach effective and economical ventilation practices and design techniques through the application of established principals. Ventilation systems provide the desired control over the in-plant environment and when they are properly planned, designed and maintained, will operate within the constraints of air pollution emission control and energy limits. This conference will present the principals of airflow, how to control airborne contaminants and how to properly design and test systems. There will be both lectures and hands on problem sessions that will take you step by step through the design of various types of systems. You will learn to select appropriate exhaust devices and hoods, determine air volume and minimum duct velocity, how to size duct, the calculation of system pressure losses, the selection of fans, air cleaning devices and other ventilation topics. This course will help you understand, design and maintain efficient, effective and economical industrial exhaust ventilation systems. Each attendee will receive a copy of the latest edition of *Industrial Ventilation – A Manual of Recommended Practice* published by American Conference of Governmental & Industrial Hygienists (ACGIH).

Who Should Attend

This course is intended for plant engineers, industrial hygienists, sheet metal contractors, plant and operations managers, consulting engineers, safety engineers, mine engineers, regulators, inspectors, insurance investigators, risk managers and anyone involved in ventilation system design, maintenance and performance.

Benefits of Attending

- Provide a safe and healthy working environment
- Save thousands of dollars with proper system design
- Reduce liability and risk
- Reduce energy costs
- Improve product quality
- Take home a comprehensive package of course materials that includes the Industrial Ventilation Manual, detailed technical information on fans and related engineering reference materials.

COURSE SCHEDULE

Monday, October 15, 2007

8:00 a.m. to 5:00 p.m.

7:30 a.m. to 8:00 a.m.	Registration
8:00 a.m.	Opening Session/ Welcoming Remarks – David Eckhoff, The University of Arizona
	Plan of Instruction and Division of Classes – Ray Hunter, Ray Hunter and Associates
8:30 a.m.	Principals of Air Flow – Tom Godbey, Donaldson Company Inc.
9:15 a.m.	Classroom Problems
9:50 a.m.	<i>Break</i>
10:00 a.m.	Hood Design – Gaston White, PGW Consulting
10:50 a.m.	Classroom Problems
12:00 noon	<i>Lunch</i>
1:00 p.m.	Classroom Problems
2:30 p.m.	<i>Break</i>
2:45 p.m.	Duct Design – Rick Gondeck, National Filter Media
3:15 – 5:00 p.m.	Classroom Problems

Tuesday, October 16, 2007

8:00 a.m. to 5:00 p.m.

8:00 a.m.	Classroom Problems
9:30 a.m.	<i>Break</i>
9:45 a.m.	Fan Selection & System Effects – Tim O'Hare, New York Blower, Inc.
11:00 a.m.	Classroom Problems
12:00 noon	<i>Lunch</i>
1:00 p.m.	Classroom Problems
2:30 p.m.	<i>Break</i>
2:45 p.m.	Dust Collector Selection – Ray Hunter, Ray Hunter and Associates
3:45 – 5:00 p.m.	Classroom Problems

Wednesday, October 17, 2007

8:00 a.m. to 5:00 p.m.

8:00 a.m.	Classroom Problems
9:30 a.m.	<i>Break</i>
9:45 a.m.	Recirculation of Exhaust Air – Tom Godbey, Donaldson Company Inc.
10:30 a.m.	Classroom Problems
12:00 noon	<i>Lunch</i>
1:00 p.m.	Classroom Problems
2:30 p.m.	<i>Break</i>
2:45 p.m.	Replacement Air – Gaston White, PGW Consulting
3:30 – 5:00 p.m.	Conclude Classroom Problems/ Evaluations/Certificates

Problem Sessions

You will need to choose one of the following problem sessions. The problem sessions begin with standard ventilation design concepts and progress to the development of complete systems. The problems are sequenced to allow you to develop the necessary skills to design complete ventilation systems. You will learn to select exhaust systems for various situations, determine air volume, minimum duct velocity, size duct, calculate system pressure losses and select fans and air cleaning devices. **We ask that you bring a calculator with scientific functions to aid in working the classroom problems.** All problem sets and calculation sheets will be provided.

Ventilation System Design – These classes are intended for plant engineers, safety, health and environmental professionals, mine engineers, fabricators, designers and consultants. It is also recommended for persons who do not design systems regularly, have maintenance responsibilities or have no prior experience or specific education in ventilation system design. The problems will emphasize fundamentals of air flow in systems and will include selection of exhaust hoods, determination of air volume and maximum duct velocity, sizing of ducts, calculation of system pressure losses and selection of fans and air cleaning devices. High temperature without moisture will be introduced.

Non-Standard Air – These design classes will deal with exhaust systems that involve elevated air temperature and/or moisture where the density may vary significantly from standard conditions. Air volume and pressure calculation will be made using psychrometric charts in order to determine duct sizes, fan characteristics and adequate motor horsepower. **Before attending this problem session it is recommended that you have attended the Ventilation System Design session in this or another ventilation conference.**

7th Annual Fan System Maintenance & Troubleshooting Workshop

Maintaining Plant & Facilities Ventilation Systems for Proper Contaminant Control

December 3–5, 2007

Workshop Overview

This course utilizes discussion, hands-on demonstrations and problem solving exercises using common exhaust hoods, centrifugal fans and a working ventilation system to provide guidelines and instruction to understand proper hood design, how to evaluate fan system airflow and performance, fan maintenance, and how to troubleshoot fan problems. The Fan System Testing session includes an introduction to fan types and their applications, explanation and demonstration of fan system effects, and a hands on training session on how to determine fan system performance using both hood static pressure measurements and pitot tube traverses – including plotting fan and system curve performance for different types of fan systems. The Fan Maintenance session covers how to tension and align v-belt drives; wheel to inlet cone tolerances/alignment; causes of fan vibration; proper fan installation practice; system effects on bearing life; understanding fan speed limits, and understanding fan sound issues. The troubleshooting session includes need for maintenance, maintenance scheduling, technical documentation, baseline data at startup, troubleshooting a system using the static pressure method, baghouse and fan troubleshooting. A correctly designed and maintained system provides for in-plant contaminate control and does so at a minimum system and operating cost as well as energy usage. Good ventilation system design and maintenance practices provide major benefits in economics, health, product quality, energy conservation and legislative compliance.

Who Should Attend

This Workshop is intended for Plant Engineers, Contractors, Maintenance Managers, Service Providers, Designers, End Users and those who are responsible for installation and maintenance of centrifugal fans and ventilation systems used in industrial process applications.

Benefits of Attending this Seminar

1. Understand and recognize correct and incorrect installations
2. Save thousands of dollars with proper system maintenance and design
3. Hands-on training on a real demonstration system
4. Understand how to measure system airflow
5. Reduce liability and risk
6. Take home a comprehensive package of course materials that include detailed technical information on fans and air cleaning devices, as well as related engineering reference materials.

COURSE SCHEDULE

Monday, December 3, 2007

Ventilation System/Hood Design

- 8:00 a.m. – 8:30 a.m. **Registration**
8:30 a.m. – 4:30 p.m. **Principles of Airflow**
Hood Design & Entry Loss
Duct Design
Typical Hood Problems & Examples
Fan Types & Selection

Tuesday, December 4, 2007

Fan System Testing Workshop

- 8:30 a.m. – 4:30 p.m. **Fan System Effects – Demonstration**
Fan System Testing – Hands On

Wednesday, December 5, 2007

Fan System Maintenance Workshop

- 8:30 a.m. – 4:30 p.m. **Fan Workshops continued**
Troubleshooting and
System Maintenance Issues
Questions & Answers

Hands-On Testing Workshops

You will participate in hands-on sessions where you will perform various system measurements including using a pitot tube traverse to determine flow rates, hood static pressure, duct pressure drop and simulation of fan and system curves. The demonstration unit is modified to employ various hood shapes (plain, flange, conical, bell mouth), as well as illustrate “fan system effects” and can be converted from single to multiple hood configurations. Everyone participates.

This course will incorporate lectures, problem solving and hands-on workshops. You will receive a set of handouts and reference materials to take with you. The program will incorporate hood static pressure, fan curves, volume calculations, fan selection and hands-on system evaluation.

Conference and Workshop Staff

Ray Hunter – Conference Chairman

Ray Hunter & Associates, Inc, Birmingham, AL

R. D. Eckhoff

The University of Arizona, Tucson, AZ

Tom Godbey

Donaldson Co. Inc., Louisville, KY

Rick Gondeck

National Filter Media, Olive Branch, MS

Bob Hash

Air System Sales, Nashville TN

Bob Hunter

Ray Hunter & Associates, Birmingham, AL

Dan Josephs

AAF International, Louisville, KY

Gerry Lanham

KBD Technic, Cincinnati, OH

Dave Maletich

The New York Blower Company, Willowbrook, IL

Tim O'Hare

The New York Blower Company, Willowbrook, IL

Dale Price

M&P Air Components, Inc., Irvine, CA

Michael Ridge

Environmental Safety and Health Services, Birmingham, AL

Andy Thomason

Cerex Advanced Fabrics, Pensacola, FL

Gaston White, PE

PGW Consulting Services, Birmingham, AL

Fees and Registration

The fee for each course is **\$895.00** U.S. Registrations must be made in advance and all fees are due by program start date. (If you register for both courses at the same time you will receive a reduced fee of \$1,600.00). The **fee includes all course materials** and a comprehensive package of related engineering reference materials and breaks each day (lunch on your own). The fee **does not** include travel and lodging. The University of Arizona reserves the right to cancel this course. In the event of cancellation, all registration fees will be refunded in full. The University of Arizona cannot be held responsible for costs incurred other than the registration fees. Cancellations received two weeks prior to the program start date will receive a full refund. Cancellations must be in writing or e-mail. Substitutions are accepted at any time.

Enrollment will be limited: therefore, early registration is advised. To register call (520) 621-3054 or complete the enrollment form and FAX it to (520) 621-1443, or mail it to The University of Arizona, College of Engineering – Engineering Professional Development, 1224 N. Vine Avenue, Tucson, AZ, 85719-4552. On-line registrations can be made at <https://www.epd.engr.arizona.edu/ventconf-2006.php>

Location

28th Annual Birmingham Industrial Ventilation Conference October 15 – 17, 2007

Conference check-in will be from 7:30 to 8:00 a.m.. on the first day, October 15, 2007 at Oxmoor Inn, I-65 & Oxmoor Road, Birmingham, Alabama, 205-942-2041

7th Annual Fan System Maintenance & Troubleshooting Workshop December 3 – 5, 2007

Conference check-in will be from 8:00 to 8:30 a.m. on the first day, December 3, 2007 at: Circus Circus Conference Meeting & Convention Facilities located in the Skyrise Tower, 2880 Las Vegas Boulevard South, Las Vegas, NV, 1-800-634-3450 or 702-691-5950

Credits

The University of Arizona will award 2.1 Continuing Education Units (CEUs) for each program. This is equivalent to 21 engineering PDH credits. The American Board of Industrial Hygiene will award 3.0 Industrial Hygiene CM points to Certified Industrial Hygienists who complete the Industrial Ventilation Conference. ABIH Approval #07-1651

Registration Form: 2007 Industrial Ventilation Conference and Fan System Workshop

Name _____

Affiliation _____

Address _____

City _____ State _____ Zip _____ Country _____

Phone _____ Fax _____ Email _____

Registration Fees (per person)

- Industrial Ventilation Conference \$895.00
- Maintenance & Troubleshooting Workshop \$895.00
- Conference and Workshop \$1600.00

Please choose one of the following problem sessions for the **Industrial Ventilation Conference**

- Ventilation System Design
- Non-Standard Air

Total Enclosed \$ _____

Please make checks payable to:
The University of Arizona Foundation

NOTE: Registration fees are not a tax-deductible contribution. However, they may be a business expense. Consult with your accountant or tax advisor.

If you wish to use VISA, MASTERCARD or AMERICAN EXPRESS card:

Card No. _____ Exp. _____

Signature _____ Date _____

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Engineering Professional Development at the number listed below. Requests should be made as early as possible to allow time to arrange the accommodation.

I have the following special needs/requirements: _____

Mail/Fax or e-mail this form to:

Engineering Professional Development

The University of Arizona
1224 N. Vine Avenue
Tucson, AZ 85719-4552
Phone: 520-621-3054

Fax: 520-621-1443

E-mail: epd@engr.arizona.edu

On-line registration:

www.epd.engr.arizona.edu/ventconf-2006.php