

68th MIVC Seminar Descriptions

Principles of Airflow

When designing an industrial ventilation system, one must first understand the properties of the airstream and how air flows. This seminar provides the background necessary to successfully design and economically efficient industrial ventilation system. First, the conservation of mass and energy in a ventilation system is addressed. Then, the seminar addresses various airstream properties, such as density and density factor. The seminar also discusses ventilation system airflows and velocities. The three pressures present in all ventilation systems, total, static, and velocity, are also discussed in this seminar. Finally, the seminar addresses the testing of ventilation systems to determine various operating parameters, such as the equipment used to test such systems and determine their air flow rates, velocities, and pressures. Failure to fully understand the principles discussed in this seminar make the successful design of industrial ventilation system extremely difficult. It is recommended that all conference attendees, regardless of the course of instruction, attend this seminar.

Principles of Hood Design

Once the air properties have been determined, industrial ventilation system design begins with determining the types of hoods to be used in the system. This seminar addresses the fundamental principles associated with hood design and performance. Various hood classifications and types, velocities (e.g., capture, face, slot, plenum, and duct), determining required hood airflows, and hood energy losses are presented in this seminar. It is recommended that all conference attendees, regardless of the course of instruction, attend this seminar.

Principles of Duct Design

This seminar explores the variety of duct components in a system and how they work together to move air through an industrial ventilation system. This includes in-depth discussion on the friction and dynamic losses associated with components such as straight duct lengths, elbows, branch entries, contractions, and expansions. Classes of duct systems, materials of construction, duct supports and connections, sizing of duct systems, and the determination of energy losses in duct components are also presented in this seminar.

Determining the Need for Ventilation

In many instances, the need for industrial ventilation in the workplace is determined by an employee exposure assessment conducted by an industrial hygienist. Such monitoring is also performed to verify an installed industrial ventilation system protects the health of employees. This seminar addresses air monitoring terminology and the performance of workplace air contaminant exposure assessments. The use of ventilation to protect employee health, as well as other common workplace hazards are also discussed in this presentation.

Fan Selection

This seminar addresses a variety of important fundamentals associated with fan selection. Various fan types and fan components are presented in this seminar. Additionally, fan operating principles associated with fan speed, airflow, pressure, and power are also discussed.

Fan System Effects

Fans used in industrial ventilation systems operate most efficiently when there is an appropriate length of straight duct located at both the fan inlet and outlet. The pre-spinning of air at the fan inlet, as well as obstructions located at the fan inlet and/or outlet, will also impact fan efficiency. This seminar addresses the testing of fan performance as well as the various inlet and outlet conditions that will result in a loss of fan efficiency. If such impacts on fan performance are not properly assessed, it is unlikely that the ventilation system will not perform as desired.

New Fan Seminar

This fan seminar will address topics such as the selection of fans at non-standard conditions, use of variable frequency drives (VFDs), and motor selection basics.

Recirculation of Exhaust Air

Failure to provide for adequate supply air may negatively impact the performance of industrial ventilation systems. This seminar addresses the design of supply air systems and recirculation of exhaust air.

Mechanical Collection and Baghouses

This seminar addresses the use of inertial/momentum separators, cyclones, and fabric collectors to successfully remove particulate contaminants from an airstream.

Ventilation Regulations, Standards, and Codes

This seminar addresses the various regulations, standards, and codes impacting the use, installation, and performance industrial ventilation systems.

Applied Ventilation

This seminar presents various industrial ventilation case studies useful for tying together the design principles presented in the conference's various seminars and classroom problems.

Scrubbers, ESPs, and Other Collectors

This seminar addresses the use of wet scrubbers, electrostatic precipitators, and other air pollution control technology to remove contaminants from an airstream.

CFD for Dummies

This seminar addresses the use of computational fluid dynamics (CFD) in the design of industrial ventilation systems. The seminar provides an opportunity to visually see the flow of air in ventilation system components is modeled and depicted by the use of CFD.

Combustible Dust

The National Fire Protection Association (NFPA) creates numerous standards and codes for use and adoption by various governmental agencies. A number of these standards address the assessment and control of fire and explosion hazards posed by combustible dust. Specifically, NFPA 652, *Standard on the Fundamentals of Combustible Dust*, provides the general requirements for the management of combustible dusts and provides recommended content useful in the performance of a combustible dust hazard assessment. This seminar provides an overview of combustible hazard control and the content of NFPA 652.