Samuel Tepp Associates
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Samuel Tepp Engineering Seminar Topics

All topics are approved for New Jersey and Pennsylvania PE Continuing Education Credits
New York State education credits are approved as noted
New Jersey Approved Course Provider 24GP00004900

Gas Monitoring for HVAC Applications

NY Program Submittal # 20180326

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

National and local codes mandate hazardous gas monitoring and recent code changes have increased the types of gases to be monitored and the applications requiring monitoring. The presentation will:

1. Review applicable codes and standards for gas monitoring system design and maintenance
2. Discuss types of hazards
3. Outline exposure limit types and the limits imposed by various organizations
4. Discuss the types of gas monitoring systems and configurations and the pros and cons of each
5. Review common gas sensor types, calibration requirements, life expectancy and sensor position in the space to be monitored
6. Discuss typical design requirements
7. Review common application details-garages, boiler rooms and refrigeration machinery rooms
8. Provide an overview of system installation, commissioning and maintenance requirements and best practices
9. Design, Commissioning and Calibration Support Services

Basics of Room Air Distribution and Air Distribution Performance Index (ADPI)

NY Program Submittal # 20150521

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

The basic physics of air distribution must be fully understood before one can properly select components for a project. This presentation will cover:

1. Diffuser performance terminology
2. Air Diffusion Performance Index (ADPI) definition and purpose
3. Diffuser selection methods for cooling and heating applications
4. Common air distribution devices
5. Selecting and positioning air distribution components
6. System parameters for effective air mixing
7. Well mixed (Inductive) air distribution
8. Overview of non inductive air distribution
9. LEED requirements for air distribution
10. ASHRAE Thermal Comfort Standard 55-2010 and determining optimum comfort strategies
11. Requirements of ASHRAE Ventilation Standard 62.1-2010 and air distribution component selection
12. Diffuser selection effect on project cost

Samuel Tepp Engineering Seminars

Overview of HVAC System Design Concepts: Underfloor Air Distribution, Chilled Beams, Dedicated Outdoor Air Terminals and Displacement Ventilation NY Program Submittal # 20150526

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-Two PDH

An outline presentation of design issues related to these concepts will discuss the following:

1. Why new HVAC system design concepts need to be considered
2. Discuss the limitations of common VAV system applications, their operating costs and renovation costs.
3. LEED perquisites and requirements
4. ASHRAE Standard 62.1 (Ventilation) and Standard 55 (Thermal Comfort) compliance
5. Air distribution sound level conformance
6. For each of the new design concepts, UFAD, CB, DOAS terminals, and DV discuss:

    a. Why and when to use or not to use these design concepts.
    b. What differences in outdoor design conditions may be required?
    c. What additional building design and construction trade coordination is required?
    d. What system components are usually required?
    e. What typical controls are required?
    f. What differences in first and operating costs can be expected relative to standard VAV designs?
    g. What construction and operating problems have been experienced?
    h. What is the impact on space requirements for mechanical components?
    i. What unique design issues must be addressed?
    j. The advantages and disadvantages of these design concepts

Detailed Discussion of Chilled Beams and Dedicated Outdoor Air Terminals Concepts

Approved for New Jersey and Pennsylvania Continuing Education Credits-One PDH
New York State-Two PDH Credits When Combined Presented With Displacement Ventilation and Underfloor Air Distribution Concept-Detailed Review

With the goal of saving energy over the 90.1 baseline (Overhead VAV), many architects are challenging mechanical engineers to provide alternate system designs. Chilled Beams have a potential to save energy, and meet these needs. Chilled Beams and dedicated outdoor air terminals can be attractive methods of delivering outdoor air at low potential energy cost while reducing building space requirements for mechanical system components. In order to meet the thermal comfort expectations of building occupants, designers must be aware of the conflicts between first costs, occupant productivity and life cycle costs. The presentation includes the following:

1. New design requirements:
    a. LEED V3 has significant changes from earlier versions that have major effects on air distribution, ventilation requirements and thermal comfort.
    b. Thermal Comfort: Determining optimum occupant comfort strategies. ASHRAE Standard 55 has been revised.
    c. IAQ: The changing face of ASHRAE Standard 62.1, and upcoming developments.

2. Chilled Beam Systems:
    a. Active and passive chilled beam operation
    b. Chilled beam system components
    c. Typical chilled beam design criteria-cooling and heating
    d. Pros and cons of chilled beam applications

3. Dedicated Outdoor Air Fan Terminals:
    a. DOAS fan terminal system concept
    b. DOAS fan terminal components
    c. DOAS applications and combined chilled beam/DOAS fan terminal designs
    d. Pros and cons of DOAS terminal applications

Detailed Discussion of Displacement Ventilation and Underfloor Air Distribution Concepts

Approved for New Jersey and Pennsylvania Continuing Education Credits-One PDH
New York State-Two PDH Credits When Combined Presented With Detailed Discussion of Chilled Beams and Dedicated Outdoor Air Terminals Concepts

This presentation will include discussion of the following:

1. Why consider using under floor air distribution systems for comfort cooling
2. Typical building component requirements for UFAD design
3. Comparison of typical HVAC design and UFAD system first and renovation costs
4. Detailed review of the UFAD design concept and floor plenum design considerations
5. Common UFAD system cooling and heating design concepts and options
6. Typical UFAD air distribution components
7. UFAD design concerns including perimeter space cooling and heating design, conference room design, humidity issues, and air leakage control.
8. LEED point availability with UFAD systems

Selecting VAV Terminals for Acceptable Environments

Approved for New Jersey and Pennsylvania Continuing Education Credits-One PDH

With the large number of VAV terminals available, including ECM motors for all series boxes, there are frequent questions about the proper selection and interpretation of VAV terminal specifications and the application of VAV terminals. Included in the discussion will be:

1. Review of terminal types and their typical applications
2. Proper engineering specifications for VAV terminal types
3. Updates on ASHRAE Standard 55 and 62.1 requirements for VAV box application and specifications.
4. Terminal selection guidelines
5. The latest industry understanding of the proper application of overhead heating to comply with ASHRAE Standard 62.1-2013 and LEED Version 4
6. Application of DOAS on series fan powered terminals equipped with a non-condensing cooling coil.

Air Distribution for Laboratories and Clean Rooms NY Program Submittal # 20150522

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

Review of common laboratory and common clean room issues includes the following:

1. The common types of laboratories and clean rooms
2. Laboratory air motion control and the importance of proper air distribution in laboratories
3. Design parameters including air change requirements, airborne contaminants, room air motion, air pressure control, fume hood containment, fume hood/room air interaction, and occupant comfort
4. Types of laboratory and clean room air outlets and their application
5. Comparison of particulate removal efficiency in laboratories with laminar vs. forced displacement diffusers and high induction vs. forced displacement diffusers
6. Performance and application of high accuracy air control valves and overview of typical laboratory air pressure and supply and exhaust air volume controls
7. Brief overview of clean room designs and air distribution products

Air Distribution in Hospital Operating Rooms NY Program Submittal # 20150523

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

The following will be discussed:

1. Definition of the typical conditions desired to exist in operating rooms-including desired air motion level and airborne particulates/pathogens concentrations
2. Methods of controlling airborne particulates and pathogens including filtration and dilution
3. Comparison of clean room air distribution with operating room air distribution requirements
4. Effectiveness of laminar flow type air distribution in operating rooms and the vertical velocity gradient
5. The effect of exhaust locations on air motion in operating rooms
6. The benefits of combining air curtain with laminar flow diffusers in operating rooms
7. The advantages of a factory designed and integrated operating room air distribution system that can incorporate LED lighting

Optimizing Fan Selections: Fan Laws, Fan Efficiency, and Lowest Total Cost of Ownership

NY Program Submittal # 20150524

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

The needs to properly and efficiently select and apply fans and conform to the latest codes are fundamental requirements. Understanding fan terminology, types of fans and their typical applications, and optimizing fan selections for a project assures client satisfaction. Knowing how to apply the fan laws enables engineers to predict how fans can be modified to meet new operating conditions and to solve fan performance shortfalls. The presentation will address these issues by discussing the following:

1. Fan components and performance terminology
2. Fan performance curves and common field instrumentation
3. Fan law assumptions and limitations
4. System effects-what they are and their consequences
5. How to minimize system effects
6. AMCA fan testing requirements and fan catalog performance
7. Selecting fans to minimize energy consumption and total cost of ownership
8. Fan performance measurement and application errors
9. Fan Efficiency Grade-what is it and compliance with ASHRAE 90.1-2013
10. Expected Federal Government fan efficiency requirements

Variable Frequency Drives in HVAC Systems NY Program Submittal # 20150525

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

The VFD presentation will cover the following areas:

1. Brief review of common types of three phase motors and their components
2. Three phase motor torque characteristics
3. Discussion of constant and variable torque motor loads, typical applications, and the relationship of motor torque to current frequency
4. Review of typical and optional VFD components when applied in HVAC systems
5. Definition of pulse width modulation and explanation of the relationship between pulse width and motor speed
6. Definition of harmonics, the relationship of VFD's and harmonics and the design requirements needed to avoid harmonic induced power distribution problems
7. Common VFD application concerns

Samuel Tepp Engineering Seminars

Kitchen Ventilation and Exhaust Hood Presentation Summary

Approved for New Jersey and Pennsylvania Continuing Education Credits-One PDH

The Kitchen Ventilation presentation will cover the following areas:

1. Reasons for kitchen exhaust and make up air
2. Design considerations, including common code requirements (e.g. NFPA 96, IMC, UL 710) and types of kitchen appliances
3. Comparison of Type I and Type Hood II applications
4. How hoods operate and common hood options
5. Listed vs. non-listed hood exhaust requirements
6. Grease filter options
7. Make up air design options (treated vs. non-treated and dedicated vs. non-dedicated make up air units)
8. Energy management and odor control choices
9. Field vs. factory fabricated grease duct considerations
10. Grease exhaust fan options

Acoustics Basics for HVAC Applications NY Program Submittal # 20160039

Approved for New Jersey, New York and Pennsylvania Continuing The HVAC Acoustics presentation will cover the following:

1. Terminology definitions and explanations-sound power and sound pressure
2. Sound frequency and the range of normal hearing
3. Calculating wave length and the effect of distance on sound level
4. Sound quality and common description criteria, NC, dBA, dB, Sones
5. Acoustical evaluation methods
6. Noise sources and paths-indoors and outdoors
7. Compare and contrast acoustical treatment options
8. Sound attenuator types, performance and application criteria
9. Aerodynamic effects of sound attenuators
10. Design process to minimize acoustical difficulties
11. Sample indoor and outdoor noise calculations

Education Credits-One PDH

Vibration Basics for HVAC Applications NY Program Submittal # 20160041

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

The HVAC vibration presentation will cover the following:

1. Vibration terminology review.
2. Discuss single and multiple degree of freedom systems.
3. Discussion of transmissibility, transmissibility curves, and isolator efficiency.
4. Review the effect of isolator efficiency on vibration transferred to the structure.
5. Criteria used to establish acceptable vibration levels for occupants and equipment.
6. Review the effect of equipment foundations and structure deflection on isolator selection.
7. Discuss typical design criteria and source references for design criteria.
8. Review information needed to properly design vibration isolation applications and select equipment.
9. Discuss the application of multiple isolators in a system.
10. Review isolator types and their typical applications.
11. Review sources for design and application assistance

Samuel Tepp Engineering Seminars

Seismic and Wind Restraint Basics for HVAC Applications NY Program Submittal # 20160040

Approved for New Jersey, New York and Pennsylvania Continuing Education Credits-One PDH

1. Review when and where seismic and wind restraints required.
2. Describe nonstructural component designation.
3. Discuss the codes that establish restraint requirements.
4. Review which project professionals typically establish the criteria for seismic and wind restraints.
5. Discuss building risk categories, equipment importance factors, seismic and wind design categories, and how they determine seismic and wind restraint requirements.
6. Discuss how equipment location effects restraint requirements.
7. Discuss types of restraint equipment and briefly discuss their applications.

About Samuel Tepp Associates

Samuel Tepp Associates is a fifty seven year old manufacturer's representative for air distribution, air movement, and motor speed control products in the commercial and industrial HVAC industry. Samuel Tepp provides support to New York, New Jersey and Southern Connecticut consulting engineers, contractors, and project owners to assure that projects develop with the most efficient and cost effective approaches. Tepp personnel with mechanical engineering degrees and long term industry experience provide assistance during project design, construction and commissioning.

Keith Miller provides Samuel Tepp engineering support services. His engineering career spans 50 years in the jet engine and HVAC industries. His initial engineering activity as a jet engine performance engineer included developing test methods, conducting tests and analyzing test results for experimental and production military and commercial engines over the very large range of pressures, temperatures and airflows required to simulate aircraft operating from sea level to over 70,000 feet. Keith's activity in the HVAC industry over the last 45 years includes many years as the president of a design/build/service mechanical contracting firm specializing in medical and industrial testing laboratories, industrial facilities, and data centers. He now provides advisory services in air distribution design, mechanical equipment selection, and the evaluation of problem air and water systems in the HVAC industry. His activity includes educational seminars at consulting engineering offices and ASHRAE meetings on the application, selection, and control of air moving and air distribution equipment. The seminars review methods to assess and improve underperforming systems and are approved in several states for licensed professional engineer's continuing education requirements.

Moving air since 1959

Samuel Tepp Associates, LLC

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Providing air movement engineering support & sales for New Jersey & Southern NY State. Application and design assistance is available for all listed manufacturers/products.

KRUEGER Excellence in Air Distribution	Fan Powered/DOAS, VAV and Underfloor Terminals, Chilled Beams, Air Handlers FCUs and GRDs including displacement, laboratory and hospital operating room systems.
Skil-aire	Comfort cooling and indoor environmental control products by Tithe Corporation.
ACME 75th	Centrifugal, axial, kitchen exhaust and supply fans, gravity ventilators, cabinet fans, centrifugal blowers, vane/tube axial fans and lab exhaust fans. **Factory standard 2 year fan warranty and 5 year fan bearing warranty.**
Hartzell Air Movement	Ventilation for heavy industry, corrosive exhaust, water/wastewater, marine, high technology/semi-conductor and power generation. Products include FRP, blowers to Class V and axial products. **Factory standard 2 year or 5 year fan warranty.**
PEERLESS BLOWERS	Clean air ventilation blowers and fans.
EATON	Variable frequency drives, motor starters and vibration isolation.
INTEC CONTROLS acme ENGINEERING PROD.	Gas detection systems, controls, commissioning and calibration for parking garages, refrigeration and industrial applications.
VIBRO-ACOUSTICS®	Noise control, vibration isolation and seismic/wind restraint curbs and components.
AIRCONCEPTS	Punkah, nozzle diffusers and round architectural grilles.
Young Regulator	Cable operated dampers, regulators and small motorized dampers.
Arrow United	Louvers, control dampers, industrial dampers and life safety products.
United Enertech	Louvers, dampers, blast dampers, sunshades, architectural grilles, life safety products and drop box diffusers.
KEES	Commercial and Industrial HVAC products and kitchen exhaust systems.
GREASEMASTER Manufacturers of Kitchen Ventilation Systems	Kitchen hoods, exhaust fans, makeup air units and energy management systems.
AMPCO heatfab	Positive pressure flue, zero clearance grease exhaust duct and AL294C exhaust duct.
Raywall Comfort Conditioning Products	Electric heating and comfort conditioning products.
Warren	Electric duct heaters.
NESM NORTHEASTERN SHEET METAL, INC.	Spiral and flat oval ductwork, gasketed fittings and sheet metal products.
RTS Rooftop Support Systems	Rooftop support systems, stands, pads and access stairs.

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Hunter Industrial — High efficiency EC motor High Volume Low Speed ceiling fans up 24' in diameter for commercial and industrial applications. **Factory standard 15 year fan warranty.**

Peerless Blowers — Clean air ventilation blowers and fans.

Eaton — Variable frequency drives, motor starters and vibration isolation.

Intec Controls / acme Engineering Prod. — Gas detection systems, controls, commissioning and calibration for parking garages, refrigeration and industrial applications.

AeroSonics Sound Control Products — Noise control products including sound attenuators and acoustical panels.

Noise Reduction — Industrial noise control solutions for generators and machinery, sound enclosures and sound attenuation products for air distribution.

KEES — Commercial and Industrial air distribution products, security grilles, stainless steel air distribution, industrial exhaust hoods and kitchen exhaust systems.

GreaseMaster Manufacturers of Kitchen Ventilation Systems — Kitchen hoods, exhaust fans, makeup air units and energy management systems.

VP 50 Years of Service — Louvers, sunshades, control dampers, industrial dampers, life safety products, gravity vents and penthouses.

AMPCO heatfab — Positive pressure flue, zero clearance grease exhaust duct and AL294C exhaust duct.

leader industries — Louvers, roof curbs, pipe portals, equipment supports and gravity vents.

Warren — Electric duct heaters.

RTS Rooftop Support Systems — Rooftop support systems, stands, pads and access stairs.

DURO DYNE — Cable operated dampers.

Atmosphere — Vortex Powerfans inline fans, filters, backdraft dampers and controls.

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