

Seminar 8: Exploring Indoor Environmental Applications with Displacement Ventilation and Radiant Cooling and Heating Systems

Sunday, June 24, 2012, 11:00 AM-12:30 PM

Seminar 8 (Intermediate)

Track: Indoor Environmental Applications

Room: 103A

Sponsor: 05.03 Room Air Distribution, 06.01 Hydronic and Steam Equipment and Systems, 06.05 Radiant Heating and Cooling

Chair: Mike McDermott, Member, Grumman Butkus Associates, Evanston, IL

Radiant chilled ceilings (CC) with thermal displacement ventilation (TDV) represent a promising integrated system design that combines the energy efficiency of both sub-systems with the opportunity for improved ventilation performance resulting from the thermally stratified environment of DV systems. Presenters cover recent indoor environmental developments in TDV systems combined with radiant cooling and heating hydronic systems. We present appropriate applications for schools, offices, laboratories and large volume spaces. We explain how ASHRAE Standards 55-2010 and 62.1-2010 impact system design of these integrated air and hydronic systems. This presentation introduces a new design method based on laboratory experiments.

Learning Objectives: Define how thermal displacement ventilation/chilled ceilings/heated floors can improve indoor environmental quality Describe appropriate indoor environmental applications for Thermal displacement ventilation/chilled ceilings/heated floors Describe air and hydronic system design strategies thermal displacement ventilation/chilled ceilings/heated floors Describe temperature control strategies for thermal displacement ventilation/chilled ceilings/heated floors Describe energy conservation benefits of thermal displacement ventilation/chilled ceilings/heated floors Explain laboratory testing methods that validate compliance to ASHRAE Standards 55-2010 for thermal displacement ventilation/chilled ceilings/heated floors

1. Contaminant Removal Effectiveness of Displacement Ventilation During Heating Season; Field Studies & Lab Report

Michel Tardif, P.Eng., Member, CanmetENERGY Natural Resources Canada, Ottawa, ON, Canada

2. Room Air Stratification and Ventilation Performance In Combined Chilled Ceiling and Thermal Displacement Ventilation Systems

Michel Tardif, P.Eng., Member, CanmetENERGY Natural Resources Canada, Ottawa, ON, Canada

3. Applied Chilled Sails and Thermal Displacement Ventilation

Jerry Sipes, Ph.D., P.E., Member, Price Industries Inc., Suwanee, GA

4. DV in Healthcare

Bob Gulick, P.E., Member, Mazzetti Nash Lipsey Burch, Portland, OR

Seminar 37: Commissioning of Under Floor Air Distribution Systems

Tuesday, June 26, 2012, 8:00 AM-9:30 AM

SEMINAR 37 (INTERMEDIATE)

Track: HVAC&R Systems & Equipment

Room: 103B

Sponsor: TRG7 Underfloor Air Distribution, 05.03 Room Air Distribution

Chair: Michael McQueeney, P.E., Member, AirFixture, Kansas City, KS

Presenters cover the differences in commissioning (Cx), troubleshooting, testing and balancing underfloor air distribution (UFAD) systems as compared to traditional ducted systems. Presentation content includes the idiosyncrasies associated with UFAD that engineers, contractors and operators need to be aware of so that obstacles to a successfully operating system can be avoided. The audience will learn how to obtain the IAQ, energy and cost saving benefits associated with UFAD through the use of proper Cx techniques. Real examples of successes and lessons learned will be used throughout the session including data collected to demonstrate compliance of system operation and performance. The seminar also highlights typical misunderstandings and misconceptions of UFAD operation and the resolutions developed during design, construction, and operation of UFAD systems.

Learning Objectives: Describe typical design issues unique to under floor air distribution (UFAD) systems and how they affect commissioning, troubleshooting, test and balancing as compared to traditional overhead ducted systems. Describe typical troubleshooting issues unique to under floor air distribution (UFAD) systems and how they affect commissioning as compared to traditional overhead ducted systems. Explain how design engineer can include design features and requirements to make testing and balancing of UFAD systems more effective. Describe HVAC control strategies appropriate for UFAD systems. Describe typical test and balancing issues unique to under floor air distribution (UFAD) systems and how they affect commissioning, troubleshooting, test and balancing as compared to traditional overhead ducted systems. Describe typical construction issues unique to under floor air distribution (UFAD) systems and how they affect commissioning, troubleshooting, test and balancing as compared to traditional overhead ducted systems.

1. Design Phase Commissioning of Under Floor Air Distribution Systems

Dennis Jones, P.E., Member, GROUP14 ENGINEERING, INC., Denver, CO

2. UFAD System Forensics and Troubleshooting Challenges

Jim Megerson, P.E., Member, Aviations & Facilities, M.E. GROUP, Overland Park, KS

3. Proper Testing and Balancing of UFAD Systems

Donald Hill, P.E., Member, Accutec Service, Inc., Lee's Summit, MO