

2011 ASHRAE ANNUAL MEETING  
Montreal, Quebec, Canada

TC8.11 Unitary and Room Air Conditioners and Heat Pumps  
Monday, June 27, 2011 4:15 – 6:30 PM  
Location: Fairmont Queen Elizabeth  
Convention Level  
Hochelaga 4

Theme/Logo



Sponsored Program

*Seminar 28: Back to Basics: Airflow in Unitary Systems.* (Monday, 9:45 – 10:45 am)  
Location: Cote St. Luc

Full Committee Agenda

1. Call to order Horak
  - a. Called to order @ 4:16 pm
2. Introductions All
3. Determination of a quorum Horak
  - a. 8 voting Members Present – Quorum met
4. Announcements and Highlights from TC Chairs Breakfast Meeting Horak
  - a. TCs are also encouraged at this meeting to provide to their section head a list of TC members that are willing to possibly serve as a session chair and/or paper reviewer for future meetings. Please provide TC#, name, e-mail address, and areas of expertise for each individual on list. The information will be compiled into a database for use by CEC.
    - i. Kirk Stifle paper review volunteer
    - ii. Vance Payne session chair volunteer
  - b. The TC/TG/TRG Manual of Procedures (MOP) has been revised to include a new committee type, Multidisciplinary Task Groups (MTGs). MTGs are different from TCs, TGs, and TRGs. The objective of the MTG is to first try and better coordinate and focus the activities of the affiliated TC and non-TC groups (EHC, REF, SSPCs, outside groups, etc) that make-up the MTG on the task for which the MTG was created without duplicating the functions of a TC or TG so that the task can be completed as efficiently as possible. In special cases, MTGs may be authorized by TAC to assume some TC/TG functions, such as research, if it is deemed necessary to better complete their task assignment. Since the need, purpose, and progress of each MTG is reassessed and reaffirmed by TAC each year, there are no term limits for the MTG Chair, Vice

Chair, Members and Alternates.

- c. New MTGs that have been formed
  - i. The Tech. Council Steering Committees on Building Information Modeling (BIM), and Building Performance Metrics, have now been converted by TAC into two new MTGs starting July 1, 2011. TAC has also approved since the Las Vegas meeting the formation of the following two new MTGs:
    - MTG.EEC      Energy Efficient Classification of General Ventilation Air-Cleaning Devices
    - MTG.ET        Energy Targets
- d. ASHRAE Google Groups & Sites tools for TCs/TGs and TRGs
  - i. Other tools that ECC is recommending that TCs use for their online collaboration space instead of a password protected "Members Only" folder on their TC website is Google Groups and Sites. Among other benefits, all members of the Google can post new information to the Site instead of just the TC webmaster.
  - ii. TAC and the Electronic Communications Committee (ECC) plan to stage a webinar this fall on how to set-up and maintain a basic ASHRAE Google Group and Site. Watch for future announcements concerning this webinar.
  - iii. The webinar that was given last fall on this subject is also posted on the Technical Committee page of the ASHRAE website.
- e. 2011-2012 Hightower Award & Service to ASHRAE Research Award Nominations
  - i. Nominations for the 2011-2012 George B. Hightower Technical Achievement Award are due to you Section Head by September 1, 2011. The award recognizes outstanding technical leadership and contributions on a TC/TG/TRG during the past Society year, excluding research and standards activities. Please go to the following link to learn more about the award <http://www.ashrae.org/technology/page/104>
  - ii. If your candidate did not make it last year, re-submit it!
- f. Upcoming Workshop and Conferences
  - i. **10th IEA Heat Pump Conference 2011**(Heat Pumps – The Solution for a Low Carbon World), June 27-August 31, 2011 – Web Conference Due to Earthquake. <http://www.hpc2011.org/>
  - ii. **ECOS 2011** (24th Intl Conference on Efficiency, Cost, Organization, Simulation & Environmental Impact of Energy Systems), July 4-7, 2011. <http://www.ecos2011.com/>
  - iii. **23rd IIR International Congress of Refrigeration**, August 21-26, 2011, Prague, Czech Republic. <http://www.icr2011.org/>
  - iv. **48th AICARR International Conference**, September 22-23, 2011, Lago Maggiore, Italy. <http://www.aicarr.org/>
  - v. **ISHVAC 2011**: 7th International Symposium on Heating, Ventilating and Air-Conditioning, Nov. 6-9, 2011, Shanghai, China. <http://www.ishvac2011.org>
  - vi. **Building Simulation 2011**: 12th International Conference of the International Building Performance Simulation Assoc (BS2011), Nov. 14, 16, 2011. [www.bs2011.org](http://www.bs2011.org)
- g. Thank You Letters to Employers
  - i. ASHRAE President – Lynn Bellenger is offering to send letters of appreciation to employers whose support contributes significantly to employees' participation at all levels of the Society. Committee members who have served ASHRAE during the 2010-2011 Society year will receive an email during the month of July with information on how to submit a request for the ASHRAE President to send a thank you letter to their employer. A link to the request form will be included in the letter.
- h. **Upcoming Program Dates**
  - a. **Chicago Meeting** - January 21-25, 2012
    - Theme: High Performance Buildings, Integrated Design, Energy Modeling and Specialized Applications

- Conference Paper Abstract/Full Technical Papers due April 18, 2011
  - Conference Papers Submitted for Review are due July 8, 2011
  - Chicago Seminar and Forum Session Proposals are due August 12, 2011
  - Conference Website: <http://www.ashrae.org/chicago/>
- b. **San Antonio Meeting** - June 23-28, 2012
- Conference Site Live: June 20, 2011
  - Conference Paper Abstract/Full Technical Papers due September 26, 2011
  - San Antonio Seminar and Forum Session Proposals are due February 13, 2012
  - Conference Website: <http://www.ashrae.org/sanantonio/>
- c. The Conferences and Expositions Committee (CEC) oversees ASHRAE’s annual and winter conferences and other specialty conferences and expositions globally. The CEC continually works to improve the conference experience for all attendees. To help keep a “pulse” on the technical issues facing professionals in the HVAC&R marketplace, the CEC seeks ideas for tracks for the San Antonio and annual and winter conferences beyond as well as topics for specialty conferences from TC members. Please submit your suggestion using the following link:

<http://www.ashrae.org/events/page/2537>

5. Agenda additions All
- a. Review ASHRAE website FAQ added to New Business
  - b. AHRI research and ASHRAE Standards added to Standards
6. Liaison reports (as they arrive) Liaisons
- a. None
7. Approval of minutes from Las Vegas Berg
- a. Moved - Murphy
  - b. Second - Spatz
  - c. Vote 8-0-0
8. Membership/Roster Horak
- a. Voting roll-off 7/1/11: Cremaschi, Li, Murphy, and Singh
  - b. Replacement voting members – Yunho Hwang, Robert Brown, Van Baxter, Ried Hart, Darin Nutter
9. Subcommittee reports
- a. Programs Mark Spatz
    - i. Montreal
      - 1. Seminar 28: Back to Basics: Airflow in Unitary Systems
        - About 75 attendees
        - Several questions
        - Roy Crawford filled in for Ray Rite
      - 2. Heat pump operation in extreme environments was not approved and will be resubmitted for Chicago
    - ii. Chicago
      - 1. Van Baxter and Dutch Uselton volunteered to review papers for a conference session
      - 2. Measurement Issues and Improvement Opportunities to ASHRAE Standards That Affect Air Conditioner and Heat Pump SEER and HSPF Ratings. – Seminar - Brian Dougherty
        - Speakers - Chad Kirkwood and Darryl Denton
        - Chair - Craig Messmer
        - Could add a third speaker
        - The speakers will report on preliminary findings by an AHRI Task Group that were charged with identifying ways for

evaluating and minimizing measurement deviations that occur in any side-by-side psychrometric test facility that is used for testing and rating central air conditioners and heat pumps. The Task Group is looking into such issues as verifying air volume measurements when using multiple flow nozzles, improving consistency in test set-ups (e.g, damper boxes, duct plenum configurations, locating of air samplers, psychrometric sampling boxes, etc.), more definitely accounting for fan motor heating contributions, minimizing the thermal mass effects of test facility components on cyclic test results, and evaluating the merits of elevating the refrigerant enthalpy test method for providing a primary measurement of capacity. The two seminar speakers will divide up the duties so that each topic is introduced and preliminary findings reported. The findings from this Task Group and others that wish to contribute could form the basis for several substantive changes to ASHRAE Standards that are used for testing and rating central air conditioners and heat pumps.

3. New Methods for Performance Predictions for Unitary Equipment – Conference Paper Session for San Antonio
  - Linear fit matching evaporator performance to condensing unit performance (Vance Payne)
  - Integrated Energy Efficiency Ratio (IEER) issues – possible speaker Dick Lord of Carrier.
  - Prediction of Cd – Brian Dougherty’s previous work.
  - Lorenzo might have a student working on a paper
  - Vance will email some other professors to see if he can get more papers
4. Systems for Low Energy Homes
  - Ram suggested a seminar (or possibly a forum) on systems for low energy homes (low SHR, liquid desiccant, controls). This could be linked to a program that was previously discussed by Bill Murphy “Moisture Management for Net Zero Buildings” Bill was to chair and 2 to 3 speakers identified could be either seminar or paper.
  - Bill Murphy may have another presenter
  - Van Baxter will chair

iii. Votes

1. Heat pump Operation in Extreme Environments
  - Bill Murphy moved to submit “Heat pump Operation in Extreme Environments” as a seminar for the Chicago meeting.
  - Second - Messmer
  - Vote – 8-0-0
2. Measurement Issues and Improvement Opportunities to ASHRAE Standards That Affect Air Conditioner and Heat Pump SEER and HSPF Ratings
  - Don Schuster moved to submit Measurement Issues and Improvement Opportunities to ASHRAE Standards That Affect Air Conditioner and Heat Pump SEER and HSPF Ratings as a seminar for the Chicago meeting
  - Second - Murphy
  - Vote – 8-0-0
3. New Methods for Performance Predictions for Unitary Equipment
  - No vote since it won’t be ready until San Antonio
4. Systems for Low Energy Homes
  - Bill Murphy moved to submit “Systems for Low Energy Homes” as a seminar for the Chicago meeting
  - Second - Berg
  - Vote – 8-0-0

- Ray Rite
- b. Research
- i. WS 1608 (Comprehensive Performance Rating (CPR) for Light Commercial Unitary HVAC, Phase 1) – Reid Hart
    1. Had been returned for revisions.
    2. Have not heard of any new activity on this RTAR
  - ii. WS1581 - “Develop alternate setup guidelines for Unitary Air Conditioner test configurations which cannot adhere to ASHRAE specified duct dimensions and external pressure tap locations” – Eric Berg
    1. Received one bid
    2. Eric Berg will ask Mike Vaughn if there is a reason why only one bid was received for this project
    3. The PES is planning on sending out the work statement for bid again with some modifications to the work statement
    4. Chris Stone suggested adding the University of Texas to the bidders list
  - iii. RTAR 1642 - Improved Compressor Performance Modeling Methodology for use in System Simulation Programs
    1. Submitted to RAC in April
    2. RTAR has been reviewed. It will be returned due to many questions from RAC
      - How bad is current method?
      - Why was existing work not mentioned?
  - iv. Co-Sponsor Opportunities
    1. TC 8.4 “A Research Study to Determine and Compare New Accelerated Corrosion Tests for Microchannel and Standard Tube & Fin Heat Exchangers”
      - Status: 8.11 voted to co-sponsor and was submitted to RAC by 8.4. Believe it was approved.
    2. TC 8.4 “Investigation of Air-side Fouling on Outdoor Condensing Heat Exchangers”
      - Status: First draft was returned with significant comments. Draft will be revised and then submitted to 8.11 for review and vote by letter ballot
    3. TC 8.10 “Sizing Residential Dehumidifiers”
      - Discussion was that it did not fall under our scope
  - v. Existing Ideas
    1. Eliminating Cyclic Testing - Estimating Cd (Eric Berg)
      - Project would be to get AHRI data and statistically analyze it.
      - Action Item: Eric Berg and Don Schuster volunteered to write RTAR.
      - Status/Discussion: No new activity, on-hold.
    2. Unaccounted for Application loads including Solar on OD Units (Dane Christianson)
      - Southern Cal Edison has collected some data. TC 6.3 was also interested. Thought was that perhaps Building Simulation TC 4.7 would be interested.
      - Action Item: Rite to pursue with Bldg. Sim. 4.7 to see if anyone there is interested. We would co-sponsor. Ram N. volunteered to help.
    3. Rooftop Unit Durability – Effect of degradation on reliability of a unit over time
      - Need to assess 5, 10 year reliability. What is really needed maintenance-wise? There is already a project in Michigan on a small scale (NREL). HVAC units in foreclosed homes are being removed and assessed for performance: Could use broader data base.
      - Action Item: Dane/Ram volunteered to work on RTAR.
      - Update/Status: No new activity known.
    4. Low temperature Applications of Heat Pumps

- How to economically size heat pumps under these conditions. Recommended ranges for different climates.
  - Action Item: Dutch U./Van B. volunteered to work on RTAR
  - Update/Status: It is unknown if there are existing guides for cold climates... Systems are usually sized for cooling loads and not heating due to applications being used in south and not north. (Yung ho also contributed). Discussion that this could be a Forum or Seminar Topic. Possible contributor is Russ Johnson??
  - Decided to add additional speaker to cover sizing to Cold Climate HP sizing.
5. Systems for NZE homes (Ram)
- Main concern is AH fan turn down and air distribution. Need guidance on zoned systems.
  - Update/Status: No new activity known.
- vi. New Ideas
1. Charge Adjustment – Reid Hart
- Do we need to have a standard methodology for how to verify that you have the correct charge?
  - Discussion: California developing method but manufacturers in SC meeting not supportive of a common method since different equipment are likely to have different specifications/requirements on charging.
2. Oil Retention and Oil Return (Rite)
- There have been recent studies on minimum velocity for oil return with current refrigerants (e.g., U of Ill and U of Maryland) but no definitive rules have been established. Do we need a project to close this out and publish in Handbook?
  - Discussion: Discussion ensued that there is interest from SC. Lorenzo Cremaschi (sp??) It would be beneficial to combine work into usable format and include in handbook or other means to make work available and easy to use. Need to determine additional interest in full committee. U of Ill (Pega?) has propriety work going. and Yung Ho, Uof M has some work but not comprehensive. Desire to possibly get RTAR to complete work and design guideline elaborated.
3. Transient Modeling (Rite)
- There are several codes available for transient modeling for refrigeration cycle applications (commercial and university), do we need some specific experimental data for transient modeling verification?
  - Discussion: There is some interest. Ask Ray to champion and try to move forward. Need some additional information and a champion (Rite???)
4. Charging method for heat pumps in heating mode.
- Discussion: Some interest but manufacturers believed this is a real long shot. Would like to have additional discussion with full committee and determine feasibility.
5. Heating mode linear fit.
- Discussion: Some discussion on this. This would be similar to research recently completed at NIST but in heating instead of cooling. Neither condenser nor evaporator curves are currently in existence but is a likely that a method could be developed. Need to determine interest from full committee.
  - Action: Shelve in lieu of a champion.
- vii. Full TC ideas:
1. (Bob Brown) New blends...compatibility of HFOs with potential oil.. AHRI is investigating a program.. There is concern but not a TC 8.11 topic.
- Action: Pass back to Section head to try and get coordination.

- c. Handbook Lorenzo Cremaschi
  - i. Ch 1 in Applications 2011
    - 1. Voted on last meeting
  - ii. Ch's 48 & 49 in Systems 2012 (vote due summer 2011)
    - 1. Need to vote on these chapters
    - 2. Submitted a draft to the voting members and made revisions based on feedback.
    - 3. Chapter 48 – added a figure of a multisplit system. Added a reference to the VRF chapter. The VRF chapter number will be updated once it is assigned. TC 8.7 VRF Chapter will vote to approve the chapter for public review on 6/28/11. Added links to equipment images. Update ARI to AHRI
    - 4. Chapter 49 – updated chapter based on comments. Will submit comments and responses to ASHRAE to show that all comments were responded to.
    - 5. Vote
      - Craig Messmer made a motion to approve chapters 48 and 49
      - Second – Murphy
      - Vote – 8-0-0
  - iii. The committee thanks Lorenzo for his hard work on these chapters.
- d. Standards Chris Stone
  - 1. See Appendix A for full standards update
  - 2. Request from AHRI USE Engineering Certification sub-committee to open standards 37 and 116 and accelerate the review process because research is in progress that may indicate that changes might need to be made to the standards.
    - a. Find out who the standards committee liaison is - Byron
    - b. Will need a chair for each standard then vote on moving it to the standards committee. There is a form to fill out.
- e. Web site Darin Nutter
  - i. The web site is up to date.

10. Old Business

- a. None

11. New Business

- a. ASHRAE Technical FAQ
  - i. Need to change references to ARI to AHRI
  - ii. Suggestions for revisions:
    - 1. Central vs window units
    - 2. Refer to window units review by AHAM
    - 3. Refer to Energystar.gov
    - 4. Add information about efficiency
    - 5. Suggest checking manufacturer's websites
  - iii. Volunteer's to revise question and answer
    - 1. Bill Murphy
    - 2. Craig Messmer
    - 3. Byron Horak
    - 4. Don Schuster

12. Adjourn

- a. Bill Murphy made a motion to adjourn
- b. Ended at 6:24 pm

**Appendix A**  
TC 8.11 Standards Report

[ANSI/ASHRAE 16-1983 \(R2009\)](#)

1988

Standard 16-1983 (R2009) -- Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners (ANSI Approved)

SPC Chair: Mark Paquette

SPC Liaison: Janice Peterson

Standards 16 and 58 are being combined into one standard with the number designation being 16.

Standards Project Committee (SPC) 16, *MOT for Rating Room Air Conditioners and Packaged Terminal Air Conditioners/Heat Pumps* meets on Tuesday, June 28, 2011 from 8:00 am to Noon. To maintain its ANSI accreditation, Standard 16 was reaffirmed in 2009 while the SPC continues its current revision process. Chairman Paquette reports that the committee is making progress on the revision and expects to have the draft completed by the second half of 2012.

[ANSI/ASHRAE 37-2009](#)

2009

Standard 37-2009 -- Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment (ANSI Approved)

Standard has been reaffirmed in 2009.

[ASHRAE 58-1986 \(R2009\)](#)

2009

Standard 58-1986 (R2009) -- Method of Testing for Rating Room Air Conditioner and Packaged Terminal Air Conditioner Heating Capacity (ANSI/ASHRAE Approved)

See discussion provided above under Std 16-1983 (R2009).

[ASHRAE 116-2010](#) (2010)

Standard 116-2010 -- Methods of Testing for Rating Seasonal Efficiency of Unitary Air Conditioners and Heat Pumps

SPC Chair: John Talbott

SPC Liaison: Allan Fraser

Standard 116 has completed the update and has been released in 2010.

[ANSI/ASHRAE 137-2009](#) (2009)

Standard 137-2009 -- Methods of Testing for Efficiency of Space-Conditioning/Water-Heating Appliances that Include a Desuperheater Water Heater (ANSI/ASHRAE Approved)

Lead TC: 6.6 (Service Water Heating)

Co-cognizant TC: 8.11

The ASHRAE Reaffirmation process and ANSI accreditation of Standard 137 was completed in January 2009. Although the cognizant technical committees may recommend action sooner, the next scheduled consideration on whether to revise, reaffirm, or withdraw Standard 137 is January 29, 2012. The next decision on Standard 137 should consider whether this standard should be revised to address the next generation of integrated heat pump designs. In the past, a few attendees have offered to serve on an eventual SPC, but no one has volunteered to chair the effort.

## **NEW STANDARDS**

### **SPC 206 - Method of Test for Rating of Multi-Purpose Residential Heat Pumps for Space Conditioning, Water Heating and Dehumidification**

SPC Chair: Wayne Reedy

Chairman Reedy has circulated a number of documents including work plans, background information, comprehensive rough draft and a detailed cross reference spreadsheet. The first formal SPC meeting will be held in Montreal Tuesday June 28<sup>th</sup> from 3:30pm – 6:00pm.

### **SPC 194 Method of Test for Direct-Expansion Ground Source Heat Pumps**

SPC Chair: Joe Parsons

This SPC is not directly on TC8.11 however it will have aspects that would be of interest. Second meeting was held Sunday June 26, in Montreal. Draft standard was circulated to the members and discussed during the meeting.

## Canvass Ballots - None

### ISO Technical Committee 86 (Refrigeration and Air Conditioning) Subcommittee 6 (Air Conditioners and Heat Pumps)

- Secretariat: [ANSI](#)
- Secretary: Mr. David C. Delaquila
- Chairperson: Mr. Daniel Ellis (USA) until end 2011

Working Group Designations – Not all are active

TC 86/SC 6/WG 1 Air-source air-conditioners and heat pumps

TC 86/SC 6/WG 2 Equipment sound ratings

TC 86/SC 6/WG 3 Water and brine source heat pumps and air

TC 86/SC 6/WG 4 Air-conditioning condensing units - Testing and rating for performance

TC 86/SC 6/WG 7 Hydronic fan-coil units

TC 86/SC 6/WG 8 Water cooling towers

TC 86/SC 6/WG 9 Air distribution devices - STANDBY

TC 86/SC 6/WG 10 Energy recovery ventilators

TC 86/SC 6/WG 11 Water chilling packages using the

#### Current Activity:

Working Group 1 of ISO TC 86/SC6 is currently working on three new standards and one new guideline as new components in addition to ISO Standards 5151, 13253, and 15042: These have been released at the CD Stage in 2010 and comments were reviewed in the 2011 January meeting. We expect a significant amount further work as a result of the comments before being released at the DIS stage.

**The ISO working group 1 met last May 17<sup>th</sup> – 19<sup>th</sup> in Lyon, France. The United States was represented by Bill Hansen for these meetings.**

#### ISO/CD 16358-1

Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors — Part 1: Cooling seasonal performance factor CSPF

#### ISO/CD 16358-2

Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors — Part 2: Heating seasonal performance factor HSPF

#### ISO/CD 16358-3

Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors — Part 3: Annual performance factor APF

#### ISO/CD TR 16491

Guide to the estimation of uncertainty of measurement in air conditioner and heat pump cooling and heating capacity tests

## Current Activity:

ISO Std 5151:2010, Non-ducted air conditioners and heat pumps — Testing and rating for performance  
*Updated Standard was released in June 2010 as a revision to 1994 version.*

ISO 13253:1995, Ducted Air Conditioners and Air-to-Air Heat Pumps – Testing and Rating for Performance

*Currently at the FDIS stage the ISO working group expects that the ISO/FDIS 13253 will be circulated at the Final Draft International Standard (FDIS) stage soon and expect final release in 2010. **APPROVED June 2011***

ISO/NP 15042, Multi-Split System Air Conditioners and Air-to-Air Heat Pumps – Testing and Rating for Performance

*Currently at the FDIS stage the ISO working group expects that the ISO/FDIS 15042 will be circulated at the Final Draft International Standard (FDIS) stage soon and expect final release in 2011.*

[ANSI/ASHRAE 13256-1:1998](#) (2005)

Standard 13256-1:1998 Water-source Heat Pumps Testing and Rating for Performance Part 1: Water-to-air and Brine-to-air Heat Pumps (ANSI/ARI/ASHRAE ISO)

This standard has been co-adopted by ASHRAE and AHRI and carries ANSI designation. The standard is referenced in ASHRAE Standard 90.1, is used in the AHRI certification program, and is available for purchase from ASHRAE. The 1998 standard was reaffirmed by ISO in early 2005.

[ANSI/ASHRAE 13256-2:1998](#) (2005)

Standard 13256-2:1998 Water-source Heat Pumps Testing and Rating for Performance Part 2: Water-to-water and Brine-to-water Heat Pumps (ANSI/ARI/ASHRAE ISO)

See discussion under ISO Standard 13256–1.

Report Submitted By: Christopher Stone