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Technical Committee 8.01 – Compressor Technology
TC8.01 Website: Link

AGENDA – 2025 ASHRAE Annual Meeting, Phoenix AZ

Main Committee [Hybrid]: Tuesday, June 24, 2025 3:30 – 5:30 PM AZ
In Person Location: Sheraton Phoenix Downtown, Alhambra (Level 2)
Virtual Info:
Join the meeting now
Meeting ID: 383 687 596 173
Passcode: w6qN7oa2

1) Call to Order – Alex Schmig(Chair)

- Introductions
- Minutes – **Bo Shen (Secretary)**
- Establishment of Quorum (13 VMs) - **Jim Douglas (Membership Chair)**

VOTING MEMBERS FOR THIS MEETING (Need 7 for a Quorum)

	Alex Schmig	6/30/2026
	Riley Barta	6/30/2025
	Bo Shen	6/30/2026
	Jim Douglas	6/30/2025
	Scott MacBain	6/30/2026
	Michael Perevozchikov'	6/30/2025

	Vincent Hwang	6/30/2025
	Erik Anderson	6/30/2026
	Chris Seeton	6/30/2026
	Craig Bradshaw	6/30/2028
	Heinz Jurgensen	6/30/2026
	Stefan Elbel	6/30/2028
	Eric Berg	6/30/2028

1. **CALL TO ORDER**

ASHRAE VALUE STATEMENT

In ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, inclusiveness and respect for others, which exemplify our core values of excellence, commitment, integrity, collaboration, volunteerism and diversity, and shall avoid all real or perceived conflicts of interest. Our culture is one of inclusiveness, acknowledging the inherent value and dignity of each individual. We celebrate diverse and inclusive communities, understanding that doing so fuels better, more creative and more thoughtful ideas, solutions and strategies for the Society and the communities our Society serves. We respect and welcome all.

Code of Ethics - https://www.ashrae.org/about/governance/code-of-ethics
Core Values - https://www.ashrae.org/about/ashrae-s-core-values
Diversity Statement - https://www.ashrae.org/about/diversity-equity-and-inclusion-dei

ASHRAE's Antitrust policy: ASHRAE agrees to comply with the Antitrust Policy as stated in ANSI Essential Requirements. Antitrust guidelines presentation: https://youtu.be/ykisOzjHyZM.

Recording (Audio, Video, Screenshots) of ASHRAE meetings, including online meetings, is strictly prohibited.

2) **Review and Approval of the 2025 ASHRAE Winter Meeting Orlando Minutes**
   - **Motion / Second:**

3) **Liaison Report (as they arrive)**
   - Section 8 Head (Kashif Nawaz)
   - Research Liaison (Carl Huber)
   - Handbook (Kevin Muldoon)

4) **Report on TAC/TC Chair's Breakfast Meeting – Alex Schmig**

   Update on material covered at TC chairs breakfast.

   Sunday, February 9th 7:00 – 9:00AM Hilton Orlando, Orlando I-II (Lower Level)

5) **Membership - Jim Douglas (Chair)**

   Introduction of new members and/or changes

   Alvaro E Araque
   Alireza Behfar – from 8.2
   Raymond W Good, Jr – from 8.2
   Trenton S Hunt – from 8.2
   Makayla Lauren Louise Ianuzzi
   Dr Margaret M Mathison, PhD – somehow dropped from roster
   Daniel Raherimanjato
   Hannah C Spargur
   Robert Tucker

   Voting member changes (7/1/2025):

   Rolling Off:

   Riley Barta – Term limit end – VM Roll off for 1 year, then voting again as chair
   Michael Perevozchikov' – Term limit end
   Jim Douglas – Term limit end
   Vincent Hwang – Term limit end

   Rolling On:

   Ray Good
   Margaret Mathison
   Connor Hayes
   Jethro Medina - Handbook

6) **Standards – Jim Douglas (Chair)**
   - **Performance Testing Standards**
     - **Standard 23-2022,** *Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units.*
     - **Standard 225-2020,** *Methods for Performance Testing Centrifugal Refrigerant Compressors and Condensing Units.*
     - Matt Cambio has reached out to ASHRAE staff regarding how to proceed with combining these standards
       - Matt to schedule WG meetings before Winter 26 conference to make a scope recommendation to TC 8.1
       - Based on WG recommendations, TC 8.1 may propose revision of Standard 23 at winter meeting

Standard 41.4-2015, *Standard Methods for Measurement of Proportion for Lubricant in Liquid Refrigerant.*

Standard 41.9-2021, *Standard Methods for Refrigerant Mass Flow Measurement Using Calorimeters.* Standard 41.9-2021 is published. Standard 41.9-2021 Addendum a. is published. The 41.9-2021R 1st Public Review began on 4/18/25 and ended 6/2/25. There were no substantive public review comments. The 41.9-2021R Publication Draft has been submitted to ASHRAE for publication.

8) Program - Erik Anderson (Chair)

- 2025 Annual Conference, Phoenix, AZ
  - Seminar 25: Reduced Order Models for Positive Displacement and Centrifugal Compressors Performance Predictions (TC 8.1) Chair Haotian Liu, Ph.D. – Monday, June 23, 8am – 9:30am

- For 2026 Winter Conference in Las Vegas, NV **[program submission deadline Aug 1, 2025]**:
  - Track 1: Fundamentals and Applications (Track Chair: Kevin Brown)
  - Track 2: HVAC&R Systems and Equipment (Track Chair: Ng Yong Kong)
  - Track 3: Refrigeration & Refrigerants (Track Chair: Haotian Liu)
  - Track 4: Research Summit (Track Chair: Li Song)
  - Track 5: Energy Storage and Grid Resiliency (Track Chair: Jon Cohen)
  - Track 6: Pathways to Building Decarbonization (Track Chair: Ehab Mamdouh)
  - Track 7: Artificial Intelligence (Track Chair: Joshua Vasudevan)
  - Track 8: Indoor Environmental Quality for Healthy Buildings (Track Chair: Joe Chow)
  - Future-Proofing the Built Environment (Track Chair: Robin Bryant)
- New Program Ideas
  - Applying various compressor technologies to AC, WC & dry cooler chillers – TC8.1&8.2
    (1) Tiffany Abruzzo agreed to Chair, Tom Watson agreed to speak to centrifugal efficiency
    (2) Oil free increasing efficiency of Air-Cooled chillers
    (3) Vote to Co-Sponsor with TC 8.2

  - Service, maintenance, troubleshooting of compressors including scroll, centrifugal and pistons, at compressor level. – Proposed by Joe Sanches, Las Vegas (TC 8,1)
    (1) Fundamentals & Applications, HVAC&R Systems and Refrigerants, or Future Proofing the Built Environment

9) Research – Matt Cambio (Chair)

- Report from Research Subcomm. Chair's Breakfast (Location/Time: Monday, June 23 7:00 AM – 9:00 AM MST; Sheraton Phoenix Downtown, Phoenix B (Level 3)

- 1879-RP – Foamability properties of LGWP refrigerants
- 1716-RP Oil Concentration of Field Installed Liquid Chillers with Flooded Type Evaporators."
- 1851-RP – Dielectric Properties of Lower GWP Refrigerants
  - 8.1 Voted to Co-sponsor in Orlando
  - Josh Hughes TC 3.1 is leading WS
- New RTAR ideas:
  - TC 8.1 Davide & Craig submitting - Assessment of Extrapolation Capabilities and Uncertainty Quantification of Multi-Refrigerant Semi-Empirical Compressor Models TC 8.1

(1) 8.2 to Co-sponsor

- TC 8.1 & 8.2 Effects of sub-atmospheric operation with low GWP, low ambient heat pumps. Leak rates and design suggestions (Matt / Daryl to follow up)
  (1) System Contaminants
  (2) Refrigerant breakdown
  (3) Possibility of electrical arching in a vacuum
  (4) Potential for combustion in the presence of oil
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10) Handbook – Jethro Medina (Chair)

- TC8.1 Refrigeration Chapter 8-factory Dehydrating, Charging & Testing (revision due 2026)
- Vacuum values update (adjusted decimal places for readability)

Vacuum is classified according to the following absolute pressure ranges:

Low Vacuum	29.92 to 1.0 in. Hg {101.325 to 3.5 kPa}
Medium Vacuum	1.0 to 4.0 × 10^{-5} in. Hg {3500 to 0.1430 Pa}
High Vacuum	4.0 × 10^{-5} to 4.0 × 10^{-8} in. Hg {1430 to 0.143 mPa}
Very High Vacuum	4.0 × 10^{-8} to 10^{-11} in. Hg {1430 to 0.143 µPa}
Ultrahigh Vacuum	4.0 × 10^{-11} in. Hg and below {0.143 µPa and below}

- Section 2 – Updated text

Karl Fischer Method. In systems containing refrigerant and oil, moisture may be determined by (1) measuring the dielectric strength or (2) the Karl Fischer method (Reed 1954). In this method, a sample is condensed and cooled in a mixture of chloroform, methyl alcohol, and Karl Fischer reagent. The refrigerant is then allowed to evaporate as the solution warms to room temperature. When the refrigerant has evaporated, the remaining solution is titrated immediately to a dead-stop electrometric end point, and the amount of moisture is determined. This method requires a 0.5 oz {15 g} sample of refrigerant and takes about 20 min. Multiple checks are run to confirm results. This method is generally considered inaccurate below 15 ppm {mg/kg}; however, it can be used for checking complete systems because this method does not require that ~~oil~~ refrigerant be boiled ~~off~~ out of the ~~refrigerant~~oil. Reed points out that additives in the oil, if any, must be checked to ensure that they do not interfere with the reactions of the method. The Karl Fischer method may also be used for determining moisture in oil alone (ASTM *Standard* D117; Mor- ton and Fuchs 1960; Reed 1954).

- Section 4 – Added Infrared Gas Detection

Infrared Leak Detection. An infrared (IR) sensor is designed to detect a target vapor via absorption of infrared radiation. The amount of absorption is concentration dependent, resulting in a measurable refrigerant-in-air concentration. A detection system will sample ambient air, emit light from an IR source to pass through the sample, and output the measurement. System outputs vary from indicating measurement ranges to quantifiable concentration values. This method is suitable for various refrigerant leak rates.

- Updated Moisture Levels per AHRI 700 and added reference

Sources of Moisture

Factory dehydration removes unwanted moisture that accumulates in components due to ambient conditions or manufacturing processes such as cleaning. Certain components are known for absorbing more moisture. For example, tests by several manufacturers have shown that the motor stator remains the primary source of moisture in compressors.

Moisture in refrigerant systems can occur in various ways (see Chapter 7). One opportunity for moisture ingress is during charging refrigerant or adding oil. Controls at the factory are required to ensure these moisture levels in the oils and refrigerant are maintained.

Because refrigerant is added after dehydration, its moisture content must be considered in determining the overall moisture content of the completed unit. Common refrigerants have a typical accepted commercial tolerance of 10 to ~~15~~ 20 ppm {mg/kg} of water content on bulk ship- ments. With some refrigerants, such as CO_2, various level of dryness may be readily available on the market. In the case of CO_2 where moisture can be reactive to the refrigerant, it is recommended to find a tolerance of less than ~~5~~ 10 ppm {mg/kg} of water content.

- **Motion:** Does TC 8.1 Accept the proposed handbook changes?
  - **Motion / Second**

11) Website – Eric Berg (Chair)

12) Old Business

13) New Business
14) Adjourn