



1791 Tullie Circle, NE • Atlanta, Georgia 30329-2305 ☎ 404-636-8400 • Fax 404-321-5478

**Technical Committee 8.01 – Positive Displacement Compressors**

**TC8.01 Website:** [Link](#)

**AGENDA – 2024 ASHRAE Annual Meeting, Indianapolis IN**

**Main Committee [Hybrid]: Tuesday, June 25, 2024 3:30 – 5:30 PM ET**

**In Person Location:** JW Marriott, 202 (2)

**Zoom Info:**

<https://purdue-edu.zoom.us/j/91854864140?pwd=ZFdwUVBiNm9iTEJ4UT09>

Meeting ID: 918 5486 4140

Passcode: 232942

**1) Call to Order – Davide Ziviani (Chair)**

- Introductions
- Minutes – **Riley Barta (Secretary)**
- Establishment of Quorum (13 VMs) - **Jim Douglas (Membership Chair) 0-0-0-0 CNV**
- Joint TC8.1&TC8.2 SubCom meeting attendance: **20 (2 guests TC8.1; 1 guest TC8.2)**

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

	<b>Davide Ziviani</b>	<b>6/30/2024</b>
	Alex Schmig	6/30/2025
	Riley Barta	6/30/2025
	Erik Anderson	6/30/2026
	Jim Douglas	6/30/2025
	Chris Seeton	6/30/2026

	Michael Perevozschikov	6/30/2025
	Scott MacBain	6/30/2025
	<b>Justin Prosser</b>	<b>6/30/2024</b>
	<b>Margaret Mathison</b>	<b>6/30/2024</b>
	Vincent Hwang	6/30/2025
	<b>Georgi Kazachki</b>	<b>6/30/2024</b>
	Heinz Jurgensen	6/30/2026

**10 voting members**

- 2) ASHRAE Code of Ethics Commitment:** 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. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)

**3) Review and Approval of the 2024 ASHRAE Winter Meeting in Chicago Minutes**

- **Motion Davide / Second: Alex 9-0-3-1 CNV**

#### 4) Liaison Report (as they arrive)

- Section 8 Head (Kashif Nawaz)
- Research Liaison (Carl Huber)
- Handbook (Kevin Muldoon)

#### 5) TC8.1 / TC8.2 Revised Scope:

- **Title:** TC 8.1 Compressor Technologies
- **Scope:** TC 8.1 is concerned with the design, performance, features, operating characteristics, and standards of all types of compressors for use with refrigerants.

[Tiffany Abruzzo] Due to the recent title & name changes to TC 8.1 & TC 8.2, we have voted & approved at our TC 8.2 main meeting to ask TC 8.1 be reassigned/ be cognizant again for Standard 225. We understand this change was made recently but it makes most sense with the more recent title changes.

**Title:** TC 8.2 Vapor Compression Chillers

**Scope:** TC 8.2 is concerned with machines using vapor compression for cooling &/or heating of liquids.

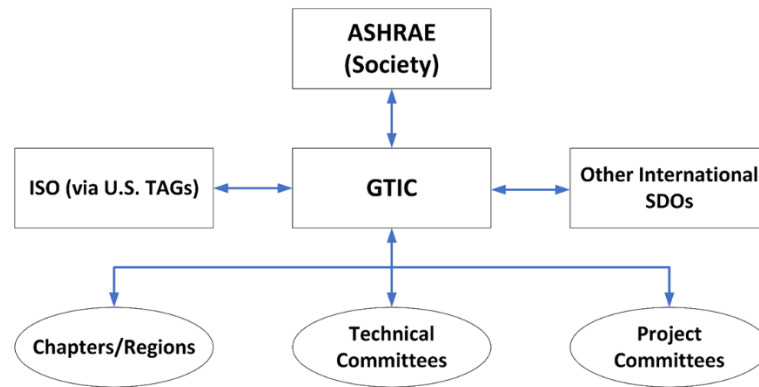
[Alex Schmig / Riley Barta second] Made motion to change title/scope and discussion  
[Scott/ Riley] 10-0-0-3 CNV

#### 6) Report on TC/TG Section 8 Chair's Breakfast Meeting – Davide Ziviani

- Code interaction subcommittee (CIS) for support to TCs
- CIS or GAC (Government Affairs): depending on the type of codes. The difference is National vs. State
- TAC Council structure: Special Projects [Balaras, Chair]. Preliminary Project List from CEBD

<ul style="list-style-type: none"><li>• Refrigerant Emissions Management, Tracking and Compliance</li><li>• Harmonizing Global Decarbonization Standards for Streamlined Compliance</li><li>• Streamlined, Flexible International Building Code Framework</li><li>• Evaluating global ASHRAE Member and Industry Needs for Building Decarbonization Education</li><li>• Optimizing PCR Protocols for Enhanced EPD Precision in HVAC&amp;R Manufacturing</li><li>• Update HVAC Equipment Service Life Data</li><li>• Standardizing Whole Life Carbon Calculations for Building Systems</li><li>• Whole-Life Carbon Options Tool</li><li>• Strategic Assessment of Embodied and Operational Carbon Trade-Offs</li></ul>	<ul style="list-style-type: none"><li>• Updating Heat Pump Testing Requirements</li><li>• A1-A3 Foundational Embodied Carbon Quantification for MEP Systems</li><li>• Heat Pump Sizing Guide: Enhanced for Defrost Efficiency and Decarbonization</li><li>• Decarbonization Framework for Data Centers</li><li>• Decarbonizing District Energy Systems Guide</li><li>• Decarbonizing Single-Family Homes: A Guide for Sustainable Retrofits</li><li>• Building Circular Economy Practices for GHG Reduction</li><li>• Expanding Decarbonization to Unconventional GHG Emission Sources</li><li>• Decarbonization Strategies for Supermarket Industry Archetypes</li></ul>
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- Global Technical Interactions Committee (GTIC)
- ISO overview



- Increase Residential DL topics in ASHRAE Chapters
- RAC Updates and modifications to RTAR/WS [Deadlines: MMAD 15 ( March 15, May 15, Aug15, December 15)]

## 7) Membership - Jim Douglas (Chair)

- 4 VM rolling off 06/2024: Davide Ziviani, Margaret Mathison, Georgi Kazachki, Justin Prosser,
- Leadership updates from 07/2024:
  - Chair: Alex Schmig
  - Vice-Chair: Riley Barta
  - Secretary: Bo Shen
  - Handbook: Scott MacBain (**Jethro Medina**)
- Voting Members 2024/25:
  - (1) Alex Schmig (6/2026)
  - (2) Riley Barta (6/2025)
  - (3) Jim Douglas (6/2025)
  - (4) Erik Anderson (6/2026)
  - (5) Scott MacBain (6/2026)
  - (6) Vincent Hwang (6/2025)
  - (7) Heinz Juergensen (6/2026)
  - (8) Michael Perevozchikov (6/2025)
  - (9) Chris Seeton (6/2026)
  - (10) Bo Shen**
  - (11) Eric Berg**
  - (12) Craig Bradshaw**
  - (13) Stefan Elbel**
- Possible voting members: **TC8.2 members that could be interested.**

## 8) Standards – Jim Douglas (Chair)

**Standard 23-2022, *Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units*.** Standard 23-2022 will be due for periodic maintenance (*Revise, Reaffirm, or Withdraw*) at the 2025 ASHRAE Winter Conference.

**Action item:** TC 8.01 will vote to approve Reaffirmation of this standard during the TC 8.01 meeting at the 2025 ASHRAE Winter Conference.

**Standard 41.4-2015, *Standard Methods for Measurement of Proportion for Lubricant in Liquid Refrigerant*.** SSPC 41 Subcommittee 41.4-2015R, chaired by Jim Douglas, has met twice since the 2024

ASHRAE Winter Conference. The goal of this subcommittee is to reach consensus on the 41.4-2015R 1<sup>st</sup> Publication Public Review draft during the 2025 ASHRAE Annual Conference.

*Informative Note:* Like all 41-series standards, Standard 41.4 has ANSI accreditation, which is expressed as ANSI/ASHRAE Standard 41.4. ANSI accreditation only lasts 10 years and Standard 41.4 was last published in 2015. To preserve Standard 41.4's ANSI accreditation, the ASHRAE Standards Committee will reaffirm Standard 41.4-2015 before the end of 2024. SSPC 41 will not have any involvement in the reaffirm Standard 41.4-2015.

**Standard 41.9-2021, *Standard Methods for Refrigerant Mass Flow Measurement Using Calorimeters*.** Standard 41.9-2021, chaired by Michael Perevozchikov, is being revised. The goal of this subcommittee is to reach consensus on the 41.9-2021R 1<sup>st</sup> Publication Public Review draft during the 2025 ASHRAE Annual Conference.

**Standard 41.10-2024, *Standard Methods for Refrigerant Mass Flow Measurement Using Flowmeters*.** Standard 41.10-2024, chaired by Pat Collins, **has been published**. This version of the standard includes new steady-state criteria and supercritical refrigerant flow measurements, in addition to subcritical refrigerant flow measurements. Thanks to Scott MacBain for providing technical guidance for the content regarding supercritical refrigerant flow measurements.

**[Phillip Johnson, TC8.2]** Reminder that the Standard Liaison shown on the rosters of TC 8.1 and TC 8.2 need to be informed of the motions/votes from each TC for recommending change of cognizant TC for Std 225. Also FYI for TC 8.1 is that TC 8.2 voted today to change our recommendation for Std 225-2020 (we had voted in January 2024 Chicago to recommend for revision, but had not yet submitted the form). The recommendation today is now to reaffirm (for now, due to late timing and 2025 approaching quickly), with the plan that once TC 8.1 is fully approved as cognizant that TC 8.1 can recommend revision after the reaffirmation process is complete. I'm working on the form and will send it to Drew Turner to sign as the current but soon departing chair of TC 8.2.

## 8) Program - Erik Anderson (Chair)

- TC 8.1 sponsored in Chicago:
  - **Seminar 11 (Intermediate; June 23 11:00am-12:30pm EDT)**, "How Hard Can It Be? Simulating and Optimizing Compressors for Next Generation Systems and Refrigerants" (Chair: Craig Bradshaw). Co-Sponsor: TC8.2 **Attendance: 34**
  - **Seminar 36 LIVESTREAM (Intermediate; June 25 9:45am-10:45am EDT)**, "The Future of Heating: Adaptive Compressors and Smart Capacity Modulation" (Chair: Riley Barta). Co-Sponsor: TC8.2 **Attendance: ~56**
  - **Seminar 41 LIVESTREAM (Intermediate; June 25 1:30-2:30 pm EDT)**, "Advancements of Low GWP Refrigerants" (Chair: Vishal ORNL). Sponsor TC10.7, Co-Sponsor TC8.1 **[full room]**
- For 2025 Winter Conference in Orlando, FL **[program submission deadline Aug 2, 2024]:**
  - Track 1: Fundamentals and Applications (Track Chair: Erik Sanchez)
  - Track 2: HVAC&R Systems and Equipment (Track Chair: Li Song)
  - Track 3: Refrigeration & Refrigerants (Track Chair: Jon Cohen)
  - Track 4: Energy Storage and Grid Resiliency (Track Chair: Robin Bryant)
  - Track 5: Pathways to Building Decarbonization (Track Chair: Joe Chow)
  - Track 6: Artificial Intelligence (Track Chair: Suzanne LeViseur)
  - Track 7: Industrialized Construction: Opportunities and Challenges (Track Chair: Stephanie Mages)
  - Track 8: Ventilation and Indoor Environmental Quality (Track Chair: Ehab Mamdouh)
  - Track 9: Future-Proofing the Built Environment (Track Chair: Joshua Vasudevan)
  - In addition to the tracks above, papers/programs that address Cold Climates are appropriate

and encouraged.

## TC8.2

[Davide/Matt] possible talk around AHRI 1520

[Phill] SSPC30 possible talk about updates on method of test. Combine the two.

Resubmission of 2 seminar proposals from Chicago: [Erik /Riley] 10-0-0-3 CNV

**Chapter 2 air-cooled vs. water-cooled chillers**

## TC8.1

[Andy JCI, Purdue, Craig, Haotian (chair)] ROM of compressors, multi-fluid extrapolation, AHRI 1520 modeling

Motion is to propose a seminar to Orlando around ROMs 4 speakers [Erik / Scott] 10-0-0-3 CNV

## 9) Research – Matt Cambio (Chair)

- Report from Research Subcomm. Chair's Breakfast (Location/Time: Monday Jun 24<sup>th</sup>, 7:00 – 9:00 am EDT; JW Marriott, White River G (1))

Resource Promotion (RP) Committee: YEA, research funding, scholarship, corporate donors.

About \$2.5M funding raised and on track with the target.

Success stories on project funded that can be advertised.

3 RTARs (2 accepted with comments; 1 returned)

7 WS (4 conditionally accepted; 3 Return

1 WS for Publication (conditionally accepted)

0 contractor projects

Awards:

- GIA: 20 awards out of 67 applicants
- NIA: Riley Barta (1 out of 14 applicants)
- IRG: 0 funded

Budget:

- 2022-23 \$5.5M
- 2023-24: \$5.6M
- 6 TRPs for bid this fall if ready
- RAC funding approval from \$250k to \$350k due to inflation pressure post COVID

PTAR: publication need, target audience, why funded effort vs. volunteer. TC will fill out and submit PTAR form to MORTS

Bill Murphy rolling off; Natasha new RAC chair

- PMS training. The next webinar will be posted to the ASHRAE website by early August 2024
- Service to ASHRAE Research Award nominated by TC/TG. Deadline Sept 1, 2024
- RAC Webtool for RTARs. BETA testing is planned by early July 2024

- **WS-1793 – Motor cooling research/thermal conductivity method of test [dropped]**

- **1879-RP – Foamability properties of LGWP refrigerants**
- **1716-RP Oil Concentration of Field Installed Liquid Chillers with Flooded Type Evaporators.”** has started (Delta Heat, Germany) Lead TC8.2; 41.4-2015 on liquid ref. samples for oil measurements being updated; J. Douglas leading; concerns leading to liquid filling guidance; Phil to pass on to TRP-1716 PI for information **Notes: early stage of the project, PMS is interacting with the PI.**
- **New RTAR ideas:**
  - **[Justin Prosser/Scott MacBain]** PFAS regulation; alternate to PFAS for compressor components; identification of alternatives/performance evaluation/compatibility. **RTAR drafting ; TC3.1 / 3.4;compatibility work from AHRI**
  - **[Davide/Craig]** uncertainty quantification of extrapolation capabilities of multi-refrigerant semi-empirical compressor models.
  - **[Matt Cambio]** Sub atm operation with low-GWP refrigerants in heat pumps
    - (1) Effect of leak rates (e.g., joints)
    - (2) Design guidelines (pressure ratio)
    - (3) Refrigerant breakdown
    - (4) Quantitative metrics
    - (5) [Chris Seeton] compressor operation/performance rather than flammability aspects
    - (6) [Jurgen] ammonia operation sub-atm, lessons learned?!
    - (7) Additional funding through AHRI.

RTAR draft by Matt Cambio

#### **10) Handbook – Scott MacBain (Chair)**

- **Incoming Handbook SubCom Chair TC8.1/8.2 Jethro Medina, Chemours**
- TC8.1 Refrigeration Chapter 8-factory Dehydrating, Charging & Testing (revision due 2026)
  - Vote/Review Chapter 8
- TC8.1&8.2: 2024 HVAC Systems and Equipment: Chapters 38 (Compressors) and 43 (Liquid Chilling Systems) for revision in 2024 (due July 2023). Submitted Fall 2023.

**[Scott] Liquid Chiller Chapter: transfer over to TC8.2? Action item to review the chapter.**

#### **11) Website – Eric Berg (Chair) Up to date.**

#### **12) Old Business**

#### **13) New Business**

- **[Joe Sanchez] displacement of CO2 compressors reached 50 cfm; subcommittee formed.**

#### **14) Adjourn**

**Jim @4:43 pm**

#### **Attachment 1: Meeting attendance list**

#### **In-Person:**

1. Alex Schmig
2. Andreas Hoess
3. Eckhard Groll
4. Mark Rogan

5. Raymond Good
6. Jethro Medina
7. Haotian Liu
8. Scott MacBain
9. Riley Barta
10. Craig Bradshaw
11. Eric Berg
12. Bo Shen
13. Stefan Elbel
14. Harshad Inamdar
15. Eric Newberg
16. Connor Hayes

**Online:**

17. Bruno Carvalho
18. Erik Anderson
19. Georgi Kazachki
20. James Spalding
21. Jim Douglas
22. Joe Sanchez
23. Matthew Mowers
24. Michael Perevozchikov
25. Dennis Nasuta