



1791 Tullie Circle, N.E./Atlanta, GA 30329

**404-636-8400**

TC/TG/MTG/TRG MINUTES COVER SHEET

**DRAFT**

TC/TG/MTG/TRG No. 8.1 DATE Jul 12<sup>th</sup>, 2023

TC/TG/MTG/TRG TITLE Positive Displacement Compressors

DATE OF MEETING June 27<sup>th</sup>, 2023 LOCATION Hybrid/ Tampa Marriott Waterside, Grand Salon E(2)

VOTING MEMBERS PRESENT	YEAR APPTD	VOTING MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Alex Schmig	YES	Hans-Joachim Kretzschmar		See Attachment 1
Chris Seeton	YES	Vincent Hwang		
Davide Ziviani	YES	Georgi Kazachki		
Erik Anderson	YES / ONLINE	Heinz Jürgensen		
Jim Douglas	YES			
Michael Perevozschikov	YES			
Riley Barta	YES / ONLINE			
Scott MacBain	YES			
Justin Prosser	YES / ONLINE			
Margaret Mathison	YES / ONLINE			

**DISTRIBUTION: All Members of TC8.1 plus the following:**

TAC Section Head: Charles Henck	SH8.1@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	See ASHRAE email alias list for needed addresses.
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

**Note: These draft minutes have not been approved and not the official, approved record until approved by the TC.**

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

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

Davide Ziviani called the meeting to order at 3:35 PM on Tuesday, June 27, 2023. Attendees were reminded to review the ASHRAE Code of Ethics (<https://www.ashrae.org/about/governance/code-of-ethics>).

All members and visitors present self-introduced as part of a formal roll call to establish the meeting attendee list. There were 29 total attendees at the meeting (19 in person and 10 online). Attendees are listed in **Attachment 1**.

2) **ASHRAE Code of Ethics Commitment:** In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)

3) **Establishment of a Quorum – Jim Douglas**

The Technical Committee consists of 13 voting members, one of which is a non-quorum voting member. 10 of the 13 voting members were present; 2 online voting members joined later.

4) **Review and Approval of the 2023 ASHRAE Winter Meeting in Atlanta Minutes**

Scott MacBain moves that the 2023 Winter meeting minutes from Atlanta be approved, Chris Seeton seconds. The vote passes: **(8-0-1-4 CNV)**

5) **Liaison Report (as they arrive)**

- Section 8 Head (Charles Henck)
- Research Liaison (Carl Huber)

Charles Henck reminded the submission of activity form and general updates from Chair's Breakfast; Charles will roll off. Carl Huber did not attend TC8.1, but Davide Ziviani was at the Research SubComm Chair Breakfast.

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

TC Chair Breakfast (Davide):

- Task Force Building Decarbonization updates: embodied carbon
  - California by July 1, 2025, whole life carbon reporting
  - TFBD is extended till 2023-24; need to engage TC liaisons in these working fluids
    - Expedite technical resources that deliver and operate low-carbon buildings
    - Whole-life carbon
    - Coordinate task force activities with TCs
  - Technical resources available
  - Education:
    - Building decarbonization 101 is available
    - 100 series seminars in the fall
    - Multiple ALI courses (3 hours)
    - Request for proposals for trainings; RFP issued in August 2023
    - [www.ashare.org/decarb](http://www.ashare.org/decarb)
  - TC Liaisons to TFBD:
    - Identify liaisons to be familiar with decarbonization activities and take leadership

- WG Chair may request engagement from TCs
- Government Affairs Department (Alice Yates, Director of Government Affairs)
  - Build relationships between the society and all levels of government in the US and the appropriate international community representations
  - Facilitate the transfer of technical counsel and assistance
  - Bi-weekly updates; outreach events, tracking legislation/regulations; support webinars, briefings, and hearings for policy makers
  - GAC to Member Council
  - Letters, Testimony, Responses to RFIs, etc.
  - [www.ashare.org/government-affairs](http://www.ashare.org/government-affairs)
- ASHRAE Strategic Plan and DEI:
  - Reevaluate and restructure Functional Groups (FGs)
  - Collaborations between different TCs (formal structure will be forthcoming)
  - Embrace activities for sustainable and high performance building
  - DEI:
    - Training material on DEI: <https://www.ashrae.org/about/diversity-equity-and-inclusion-dei>
    - Panel 2: DEI Within Your Organization
- Activity Forms: 9PM June 27<sup>th</sup>

CEC Report: update on DSA/ESA point tally form under Category F, Item 9:

- Service: Review of Abstracts, Conference Papers, Journal Articles
- Points: ¼ per package of 5 reviews with a maximum of 2 points total

## 7) Standards – Jim Douglas (Chair)

- Responsibility to all 41 standards due to SSPC committee was noted.
- Standard 23P, *Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units*.
  - Standard 23-2022 will be due for maintenance at the 2025 Winter Conference
- Standard 41.1, Standard Methods for Temperature Measurement, supported by Erik, is going out for publication and was tentatively approved.
- Standard 41.2, Standard Methods for Air Velocity and Flow Measurements, released in 2022, but Addendum A was released (Steady-state and non-steady state conditions; out for public review, approved on Sunday meeting)
- Standard 41.3, Standard Methods for Pressure Measurements, published in 2022 also, required an addendum for same conditions as 41.2, finished and published and won't need to be readdressed until Winter 2025
- Standard 41.4, *Standard Methods for Measurement of Proportion for Lubricant in Liquid Refrigerant*. SSPC 41 Subcommittee 41.4-2015R, chaired by Jim Douglas
  - Released in 2015, overdue; comments regarding sample taking and safety concerns; a new mechanism has been developed and is in the process of being tested by laboratories; still waiting for test data
- Standard 41.6, Standard Methods for Humidity Measurements, Published in 2021, Addendum A needed and has been published, come due in 2024
- Standard 41.7, "Standard Methods for Gas Flow Measurements", Published in 2021, Addendum A needed and has been published, come due in 2024

- Standard 41.8, “”, in the que to be published in 2023, not due until 2026,
- Standard 41.9, *Standard Methods for Refrigerant Mass Flow Measurement Using Calorimeters*
- Standard 41.10, *Standard Methods for Refrigerant Mass Flow Measurement Using Flowmeters*.
  - Vote passed on title, purpose, and scope in Toronto.
- Standard 41.11, approved for ASHRAE, in que to be published in 2023, not due until 2026
- Standard 41.1X, Brand New, Standard method for fuel higher heating limit, published and available in the ASHRAE bookstore
- Standard 30-2019, Method of Testing Liquid Chillers
  - No one present could speak to this; will need to follow up for more details.
- Standard 225, Centrifugal Compressors, Scott MacBain, looking at changing scope to include positive displacement compressors,
  - Jim Douglas – it was initially reported as an error that TC 8.1 was involved; ASHRAE published the document with 8.1 as the source, but we were never made aware of this. Asked Phil about next steps?
  - Jim Douglas – Do we need a motion?
  - In TC 8.2’s court, no further action from 8.1
    - i) Scott – do we want to combine Std. 225 and 23; Jim Douglas - can we get enough colleagues that know enough about centrifugal compressors?
    - ii) Wait until 2025, as that’s when it’s due for an update?
    - iii) 8.2 needs to make changes sooner, as their standard was published in 2020, so it’s up for an update sooner, therefore we need to
    - iv) Matt Cambio – Potential motion to form a WG to discuss.
    - v) Jim – Advantage would be that so many in the world are trying to form uniform standards; however, as Craig mentioned, it’s challenging to get so many together to maintain the standard
  - Form an Ad-Hoc committee, to be headed by Justin Prosser
- **ISO/TC 86/SC 4**
  - WG2-Positive displacement rating standard
  - WG3-Centrifugal compressor standard (based on AHRI 1520 and JB/T 12843)
  - WG4-ISO 917

From TC 8.2 Main Committee Meeting:

[Phillip Johnson] Std 225: TC8.2 still needs to vote on change cognizant TC (TC8.1 voted in Atlanta). Letter ballot will be sent out.

[Phillip Johnson]: the decision deadline for reaffirm/revise/withdraw Standard 225 was 4/13/2023, per a notification message dated March 17, 2022. Discuss whether or not TC 8.1 has already responded to the request to decide recommendation for reaffirm/revise/withdraw.

## 9) Research – Matt Cambio (Chair)

- Report from Research Subcomm. Chair’s Breakfast (Monday June 26<sup>th</sup>, 6:30 – 9:30 am EDT; JW Marriott Tampa, Ybor Salon IV(2))

Research SubCom Breakfast (Davide Ziviani):

- 0 RTAR; 6 WSs; 1 accepted with comments; 5 returned; 4 contractor selections for 4 projects.
- RAC Membership Bill Murphy (Chair SY2023-24)
- Awards:
  - GIA 43 candidates; 20 awards

- Service to ASHRAE Award submission deadline September 1, 2023
- ASHRAE NIA Dr. Ziviani
- ASHRAE IRG not awarded due to no blue sky ideas.
- RAC Expenditure:
  - \$5.0M in SY2019-20, ..., \$5.5M in SY2022-23. RAC increased max funding to \$250k to \$350k due to COVID inflation.
    - Students 12 months/20hr week \$100k-140k; 2 years \$250k-330k
    - Students 3 years, \$350k-450k total
  - Lots of projects with 0 bids
  - Find cost share from other organizations (e.g., pay for RAs or else) upfront
- RTAR: before end of year, online RTAR submission portal. Then we will transition to WS
- PTAR:
  - Approximately 10% of research budget
  - Design guides/manuals etc.
  - Commercial needs and too much effort for volunteers
  - Requirements:
    - Publication needs
    - Target audience
    - Why funded vs volunteer
    - Goes to MORTS; Publication Committee
    - If approved, WSP (Work Statement for Publication which has proposed table of contents instead of Scope/Technical Approach

#### Updates on ASHRAE's Research Strategic Research Plan

- **WS-1793 – Motor cooling research/thermal conductivity method of test**
- **1879-RP – Foamability properties of LGWP refrigerants**
  - i) Updates from Craig Bradshaw: constructing the test apparatus and identified pairs (TC 3.4 1:30 pm on Tuesday)
  - ii) Making good progress, construction almost finished and hope to have results late summer
- RTARs ideas from Toronto/Atlanta:
  - i) Assessment of Extrapolation Capabilities and Uncertainty Quantification of Multi-Refrigerant Semi-Empirical Compressor Models [Davide to initiate the RTAR draft]
  - ii) Decarbonization, high temperature heat pumps
  - iii) Quantification of good liquid-vapor separation (CO<sub>2</sub> as example) in the context of protecting compressors [Joe Sanchez]

[Phillip Johnson] Regarding Research SubC report for TC 8.2: ASHRAE received a proposal for TRP-1716 Oil Concentration of Field Installed Liquid Chillers with Flooded Type Evaporators. The PES needs to evaluate the proposal and bring a recommendation to TC 8.2 for a vote, preferably at the Tampa meeting.

- Looking for potential RTARs (Davide)

#### 10) Program - Erik Anderson (Chair)

- TC 8.1 sponsored in Tampa:
  - **Seminar 37 (Intermediate; June 27 8-9:30am EDT), "Challenges in Selecting an Appropriate Compressor Technology Based on Refrigerant and Applications"** (Chair: Alex Schmig). Co-Sponsor: TC8.2 & TC10.6 Attendance ~70-75, went well.
  - **Seminar 71 (Intermediate; LIVESTREAM; June 28 11 am -12:30 pm EDT), "Advanced Cycle**

Architectures for Decarbonizing Heating” (Chair: Davide Ziviani). Co-Sponsor: TC8.2 & TC8.11

- **Seminar 46 (Intermediate; June 27 11 am – 12:30pm EDT):** “ASHRAE/AHRI Compressor Test and Rating Standards: Everything you would ever want to know (and more)” (Chair: Justin Prosser): TC8.1/TC.8.2/TC1.2, Approximately 40 attendees, went well despite challenges with one speaker being unable to attend in-person.
- For 2024 Winter Conference in Chicago:
  - Track 1: Fundamentals and Applications (Track Chair: Craig Bradshaw)
  - Track 2: HVAC&R Systems and Equipment (Track Chair: Ng Yong Kong)
  - Track 3: Refrigeration & Refrigerants (Track Chair: Atilla Biyikoglu)
  - Track 4: Decarbonization & Climate Change (Track Chair: Som Shrestha)
  - Track 5: Hydronic Systems (Track Chair: Joe Chow)
  - Track 6: Ventilation, Indoor Air Quality and Air Distribution Systems (Track Chair: Ahmed H. Abdel Salam)
  - Track 7: Comfort, Indoor Environmental Quality and Energy Efficiency (Track Chair: Kristen Cetin)
  - Track 8: HVAC&R Controls (Track Chair: Alekhya Kaianabhatta)
  - Track 9: Project Delivery Methods (Track Chair: Ehab Mamdouh Abu Taleb)

[Craig/Davide] Advanced Compressor Modeling

- State of the art, Craig to elaborate on details

[Matt Cambio] Natural Refrigerants (could be technical/regulatory): status of regulations/charge limits worldwide; candidates and applications.

- 3 speakers in different application areas/capacities
- Matt to chair, specific points could be discuss later
- Alex – brought up in 10.6, S. Elbel would be interested
- Track 3 would likely be the most appropriate

- **Motion to propose (both seminars): Davide Ziviani; 2<sup>nd</sup>: Alex Schmig (10-0-0-0 CNV; passed)**

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

- TC8.1 Refrigeration Chapter 8-factory Dehydrating, Charging & Testing (revision due 2026)
- TC8.1&8.2: 2024 HVAC Systems and Equipment: Chapters 38 (Compressors) and 43 (Liquid Chilling Systems) for revision in 2024 (due July 2023).
- [Rick Heiden] Does the committee have a preference regarding the definition of a heat pump?
  - i) Began to discuss the ASHRAE definition; no action items at this point.
  - ii) Thermodynamically, both air conditioners and heat pumps are heat pumps; if reversible becomes a key point/distinction, then it should be called a reversible heat pump (Eckhard Groll)
  - iii) Discussion regarding academic vs. industrial terminology and which is more fitting or rather which ASHRAE should use.

#### **12) Membership - Jim Douglas (Chair)**

- **Current Leadership through 2024 Annual Meeting**
  - Chair: Davide Ziviani
  - Vice Chair: Alex Schmig
  - Secretary: Riley Barta
  - Handbook: Scott MacBain
  - Programs: Erik Andersen
  - Standards: Jim Douglas
  - Research Chair: Matt Cambio

- Webmaster: Eric Berg
- Membership: Jim Douglas
- VM: 13 voting members + 1 international
- 2024 Annual meeting, 4 VM to roll off. This will need to be addressed in Chicago
- Davide Ziviani will roll off at Summer 2024 meeting, Alex Schmig will then then move to chair, will have at least one open position and additional volunteers to become voting members.

**13) Website – Davide Ziviani**

- Website is up to date.
- Basecamp will also be updated
- Programs submitted over the years also to be uploaded

**14) Old Business**

**15) New Business**

Awards nominations Tiffany Abruzzo

[Alex Schmig] TC8.2 has an Award Chair, is that something that would interesting to TC8.1? Discussion in Chicago; Rick H. outgoing chair.

**16) Adjourn**

Motion to adjourn by Jim Douglas at 5:10 PM EDT



**Attachment 1 – Meeting Attendance List**

**In Person**

1. Davide Ziviani (Chair)
2. Alex Schmig (Vice Chair)
3. Matt Cambio (Research SubCom Chair)
4. Joshua Hughes (CM)
5. Syed Angkan Haider s
6. Tae Kwon
7. Hannah Spargur (Guest)
8. Lauren Man (Guest)
9. Haotian Liu (CM)
10. Eckhard Groll (CM)
11. Michael Perevozchikov (CM)
12. Craig Bradshaw (CM)
13. Chris Seeton (VM)
14. Eric Berg (Webmaster)
15. Andrew Hjortland (CM)
16. Matt Mowers (CM)
17. Scott MacBain (Handbook SubCom Chair)
18. Gang Wang (CM)
19. Jethro Medina (CM)

**Online**

20. Riley Barta (Secretary)
21. Jim Douglas (Membership)
22. Erik Anderson (Program SubCom Chair)
23. Mingxia Hu
24. Joe Sanchez (CM)
25. Parveen Dhillon (CM)
26. James Spalding
27. Eric Newberg
28. Margaret Mathison (VM)
29. Justin Prosser (VM)



## **Attachment 2 – Code Of Ethics**

### **ASHRAE Code of Ethics**

(Approved by ASHRAE Board of Directors January 31, 2007)

As members of ASHRAE, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct.

Efforts of the Society, its members, and its bodies shall be directed at all times to enhancing the public health, safety and welfare.

Members and organized bodies of the Society shall be good stewards of the world's resources including energy, natural, human and financial resources

Our products and services shall be offered only in areas where our competence and expertise can satisfy the public need.

We shall act with care and competence in all activities, using and developing up to date knowledge and skills.

We shall avoid real or perceived conflicts of interest whenever possible, and disclose them to affected parties when they do exist.

The confidentiality of business affairs, proprietary information, intellectual property, procedures, and restricted Society discussions and materials shall be respected.

Each member is expected and encouraged to be committed to the code of ethics of his or her own professional or trade association in their nation and area of work.

Activities crossing national and cultural boundaries shall respect the ethical codes of the seat of the principal activity.