



AGENDA

ASHRAE TC 3.1—Refrigerants and Secondary Coolants
American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
Hilton, Grand D Conference Room
4:15 – 6:30 p.m.

TC 3.1 is concerned with all properties and functions of refrigerants and secondary coolants, including commercial and experimental materials. Members may retrieve the complete committee roster from the AHSRAE website: log on to ASHRAE.org and sign in with your member info (from the “Join or Login” tab at top of page) the line “Welcome, [your name]” will appear at the very top of the page; click on “My Account this brings up your “ASHRAE Member Profile” click on “Committees” tab (left side of page); this brings up “My Active Committees” a line with “T-TAC-TC03.01” should appear; click the “roster” link to download a pdf

1. CALL TO ORDER (0:08) [allotted time indicated in parentheses]

Introduction of members and guests

ACTION: Quorum determination.

2. AGENDA REVIEW (0:02)

ACTION: Revise/approve the meeting agenda.

3. MINUTES OF THE LAST MEETING (0:02)

Draft minutes of the January 2018 meeting in Chicago were distributed by e-mail to committee members and posted on the TC web page; they are also attached to this agenda.

ACTION: Revise/approve minutes.

4. ROSTER REVIEW AND ANNOUNCEMENTS (0:05)

Voting Members for this meeting (committee terms expire June 30 of year listed):

Stephen Kujak, Trane, Chair (2018)

Christopher Seeton, Shrieve Chemical, Vice Chair/Program Subcommittee Chair (2020)

Kevin Connor, Dow Chemical, Handbook Subcommittee Chair (2020)

Debra Kenroy, Arkema (2019), Standards Subcommittee Chair

Barbara Minor, Chemours (2019), MTG Low GWP Liaison

Marc Scancarello, Emerson (2019)

Sean Cunningham, Mexichem Fluor, Webmaster (2020)

Bob Richard, Honeywell (2020)

Bill Kopko, JCI (2021)

Greg Linteris, NIST (2021)

Kapil Chand Singhal, BP Refcool (2021)

Knut Petry, Carrier (non-quorum) (2018)

Kenji Takizawa, AIST (non-quorum) (2020)

Other committee officers (non-voting):

Ken Schultz, Trane, Research Subcommittee Chair

Warren Clough, Carrier, Secretary

Liaisons & Other:

Steve Kujak, Trane, RAC Liaison

Barbara Minor, Chemours, MTG Low GWP Liaison

Michael Vaughn, ASHRAE Staff Liaison

Niels Bidstrup, Grundfoss Management, Standards Liaison

Jay Kohler, Johnson Controls, TAC Section Head

Guy Frankenfield, DN Tanks, 2021 Handbook Liaison
Kelley Cramm, Henderson Engineers, TAC Chair
James Bochat, Commissioning Concepts, ALI/PDC
Tracey Jumper, Jump Start Building Commissioning, Chapter Technology Transfer

5. RESEARCH SUBCOMMITTEE (:30 total) (Ken Schultz)

5.1 Report from Research Subcommittee Chairs Meeting (0:05)

5.2 Ongoing Research Projects—Status Reports (0:20)

ITEM	ACTION NEEDED	Recent Notes
1717-RP IMPROVE ACCURACY AND REPRODUCIBILITY OF ASTM-E681 TEST METHODS FOR FLAMMABILITY LIMIT MEASUREMENT OF 2L FLAMMABLE REFRIGERANTS	<i>TC3.1 Action: None</i>	Final report complete – Closure document sent. Project closed
1507-RP Binary Refrigerant Flame Boundary Concentrations and Databank for Used Binary Pairs in Commercial Refrigerants	<i>TC3.1 Action: None</i>	Technical paper being is drafted. Need update from Andrew and team on paper status.
1794-WS THE INCORPORATION OF ODORANTS IN REFRIGERANTS TO IMPROVE LEAK DETECTION	<i>TC3.1 Action: Potentially vote on selection of contractor by PES. Also selection of PMS.</i>	Approved by RAC, TRP sent out. 1 bid was received and PES to review.. PES Lead: Scancarello Members: Majurin, Clark, Baish, Kennoy

5.3 ASHRAE/AHRI/DOE Collaboration on Flammable Refrigerants Research (0:20)

Three ASHRAE lead projects have been developed to work statement phase and funded by ASHRAE. Here is an update on all projects

ITEM	ACTION NEEDED	Recent Notes
1806-RP FLAMMABLE REFRIGERANTS POST-IGNITION SIMULATION AND RISK ASSESSMENT UPDATE	Contractor – Gexcon – Work progressing PMS Schultz (chair), Omar Abdelaziz, Minor, Linteris, Phil Johnson, Takizawa, Wang. RAC members: Kujak and Khankari <i>TC3.1 Action: None, for information only</i>	Project well underway. PMS meeting regularly. Task 1 complete and report to be issued. PMS needs to review report to vote on moving on to Task 2. Working on completing refrigerant dispersion work. Project has stalled. Need to make recommendation for Task 2.
1807-TRP GUIDELINES FOR FLAMMABLE REFRIGERANT HANDLING, TRANSPORTING, STORING AND EQUIPMENT SERVICING, INSTALLATION AND DISMANTLING	Contractor Navigant Consulting – Work progressing PMS: Fricke (chair), Randy Cooper, Satheesh Kulankara, Mooris, Kashif Nawaz, Wang. <i>TC3.1 Action: None, for information only</i>	Work is complete. Report has been issued.
1808-TRP-C SERVICING AND INSTALLING EQUIPMENT USING FLAMMABLE REFRIGERANTS: ASSESSMENT OF FIELD-MADE MECHANICAL JOINTS	Contractor – Creative Thermal Solutions – Work progressing PMS: Fricke (chair), X Wang, P Geoghegan, D Halel, P Johnson, K Nawaz, M Scancarello, <i>TC3.1 Action: None, for information only</i>	Work is complete. Report has been issued.

5.4 Proposed Research Projects (0:40)

The following items are on the TC Research Plan:

Item	ACTION NEEDED	Recent Notes
1773-WS IGNITION POTENTIAL FROM ELECTRICAL DEVICES IN COMMERCIAL AND RESIDENTIAL APPLICATIONS USING 2L REFRIGERANTS	RESUBMIT WORK STATEMENT OR DROP. FIRST SUBMISSION OF WS WAS RETURNED BY RAC IN JAN. 2016. RTAR WAS ACCEPTED IN JULY 2015. TOPIC EXPIRES FROM SOCIETY RESEARCH IMPLEMENTATION <u>JULY 1, 2019</u> <i>TC3.1 Action: Currently on Hold. Need review of AHRI8017 before proceeding with action</i>	A decision by the TC was made to put this project on hold till the completion of a related AHRI project is complete. Work under AHRI 8017 is complete; report is in process. Check w/AHRI PMS to see if follow-on work is needed.
1791-WS HUMIDITY EFFECTS ON BURNING VELOCITY	SUBMIT WORK STATEMENT FIRST DRAFT BEFORE <u>DECEMBER 15, 2017</u> OR TOPIC WILL BE REMOVED FROM DISPLAY ON PLAN. WS MUST BE SUBMITTED AND APPROVED FOR BID BY <u>FEBRUARY 1, 2020</u> OR TOPIC WILL BE DROPPED PERMANENTLY BY RAC. RAC APPROVED RTAR AT 2016 WINTER MEETING. <i>TC3.1 Action: Work statement needs to be resubmitted with changes. If available, TC 3.1 can vote on resubmitting</i>	D Kennoy has drafted responses to RAC comments/questions. Suggested to wait for burning velocity at elevated humidity results from 1806-RP.
1797-WS ASSESSMENT OF THE A/B TOXICITY CLASSIFICATION USED IN STANDARD 34	RESUBMIT WS OR DROP. RAC RETURNED WS AFTER 2016 ANNUAL MEETING FOR FIRST TIME. RESUBMIT REVISED WS WITH LETTER EXPLAINING HOW RAC'S COMMENTS WERE ADDRESSED IN REVISION WITH NEW TC VOTE OR NOTIFY RAC THAT WS HAS BEEN DROPPED BY TC FOR FURTHER CONSIDERATION. RTAR STAGE SKIPPED - NOT ON PLAN YET. <i>TC3.1 Action: No Action for Information Only</i>	TC revoted on WS and it was resubmitted to RAC for action in Chicago
1802-WS DEFINING THE 2 / 2L FLAMMABILITY BOUNDARY IN STANDARD 34	SUBMIT WORK STATEMENT FIRST DRAFT BEFORE <u>MAY 15, 2018</u> OR TOPIC WILL BE REMOVED FROM DISPLAY ON PLAN. WS MUST BE SUBMITTED AND APPROVED FOR BID BY <u>JULY 1, 2020</u> OR TOPIC WILL BE DROPPED PERMANENTLY BY RAC. RAC APPROVED RTAR AT 2016 WINTER MEETING. <i>TC3.1 Action: Work statement needs to be submitted. If available, TC 3.1 can vote on submitting</i>	DKennoy to pick up again.
No RTAR Electrical Properties of New Refrigerants	<i>TC3.1 Action: No Action for Information Only</i>	An RTAR was drafted by Julie Majurin which was circulated to the committee for consideration at Long Beach. A test method already exists, but the test equipment no longer available. TC voted an approved this RTAR.
No RTAR Re-evaluate Calibration of 200L to 12 L flammability limits for borderline cases	<i>TC3.1 Action: No Action for Information Only</i>	An RTAR was drafted by Bob Kopko. SSPC 34 Flammability Sub-committee needs to review the RTAR and decide how to move forward with this drafted document.
New Project Re-evaluate Calibration of 200L to 12 L flammability limits for borderline cases	<i>TC3.1 Action: No Action for Information Only</i>	They need it for R-1234ze(E), R-1233zd(E), and R-1234yf. Question raised was, do the equations of state need to fit the existing data or do they need new data? WG is looking for financial support.

5.5 Update of TC Research Plan (0:05)

A spreadsheet summarizing the TC research plan has been posted on the TC web page; it is under the "Research" tab at: <https://tc0301.ashraetcs.org/documents.php>. This version includes attachments, including current versions of the RTARs and WS.

6. HANDBOOK (FUNDAMENTALS) SUBCOMMITTEE (0:10) (Kevin Connor)

TC 3.1 is responsible for Chapters 29 (Refrigerants), 30 (Thermophysical Properties of Refrigerants), and 31 (Physical Properties of Secondary Coolants) in the Handbook of Fundamentals.

The 2017 revisions are complete. The next revision will be for the 2020 edition.

Chapter 29- Refrigerants (Lead—Steve Kujak)

Chapter 30- Thermophysical Properties of Refrigerants (Lead—Mark McLinden)

Chapter 31- Physical Properties of Secondary Coolants (Lead—Kevin Connor)

Handbook subcommittee is meeting at Houston on Tuesday (10-11 Room 32) to start coordinating efforts.

***ACTION:** For information only, TC to take action as necessary. Do we need to schedule a recurring Handbook Meeting?*

7. PROGRAM (0:10) (Chris Seeton)

7.1 Programs at the Houston Meeting:

None

7.2 Future program plans

Future Technical Tracks

June 2018 - Houston	January 2019—Atlanta
HVAC&R Systems and Equipment	Systems and Equipment
Fundamentals and Applications	Fundamentals and Applications
District Energy and Cogeneration Plants	Refrigeration
Safeguarding your HVACR System	Construction, Operation and Maintenance of High Performance Systems
Residential: Modern Buildings in Hot, Humid Climates	Common System Options and Misapplications
Professional Skills	The Convergence of Comfort, IAQ and Energy Efficiency
Research Summit	Building Integrated Renewables and Natural Systems
HVACR Control Freaks	The Engineers Role in Architecture.
HVACR Analytics	

Important Dates

- Friday, February 9, 2018: Program (Seminar, Forum, Workshop, Debate and Panel) Proposals Due
- Friday, February 9, 2018: Revised Conference Papers/Final Technical Papers Due

The plan is to coordinate a LGWP mini track like program in Atlanta (Winter 2019) since the refrigeration track will appear at each winter meeting. Potentially consider some AHRTI FRS projects for this track. Below is the start of an outline for the refrigeration mini-track:

Houston is already pretty much booked. It will be difficult to submit and abstract now and get it approved. The plan is to do another LGWP mini track in Atlanta (Winter 2019). Consider AHRTI FRS projects for this track. Below is the start of an outline for the refrigeration mini-track:

Overview			
Equipment & Systems	Fluids	Regulations and Codes	Research
Hxers 1.3&8.11	Refrigerants - 3.1	California 2020, do we care?	Flammability
Compressors 8.1	Chemistry 3.2	Flammability	
Design Guidelines	Contaminants 3.3	EU changes	
R404A	Lubricants 3.4	EPEE - European Partnership for Energy & Environment	
R410A		Standards - what's needed?	
Unitary		Containment TC 3.8	
TC 8s			
TC 10s		Tech training	
Topic	Responsible Person	Meeting	
TC 3.1			
Update on Product Standards	Hansen, Rodgers, Dorman,		
TC 3.2			
Accelerated life predictions	Elyse and Steve	Atlanta	
TC 3.3			
Contaminant Control	TBD	Atlanta	
TC 3.4			
Purdue topics -> Seminar	TBD	Atlanta	
TC 3.8			
Tech training	Danny	Atlanta	
AHRI Leak sensor Tech			
Leak Measurement Std		Atlanta	

ACTION: Discuss program ideas, identify session chairs and vote on approving or co-sponsor sessions.

8. STANDARDS (0:05) (Debbie Kennoy)

TC 3.1 is the cognizant technical committee for ASHRAE Standards 34, Guideline 6, and Guideline 39 (formerly Standard 177p).

8.1 ANSI/ASHRAE Standard 34, Designation and Safety Classification of Refrigerants.

Action: Update from Debbie Kennoy

8.2 ASHRAE Guideline 6, Refrigerant Information Recommended for Product Development and Standards

In accordance with the requirements of Section 13 of the Standards Committee Reference Manual (3/21/2017), TC 3.1 (the cognizant Technical Committee) is voted to “reaffirm” to the Standing Reaffirmation Subcommittee (SRS) of the Standards Committee

When the TC recommends reaffirmation, the TC should review the references and their impact in the body of the main text of the reaffirmation draft. Updated references needed to implement the standard shall only include reaffirmations of the referenced standard. Referenced standards that have been revised in lieu of reaffirmed cannot be updated in a reaffirmation.

Action: TC 3.1 to discuss forming a small group to review GL6 and update any necessary references.

8.3 ASHRAE Guideline 39p (formerly SPC-177p), Method of Test for Measuring Fractionated Compositions of Refrigerant Blends (Bob Richard)

Action: Update from Bob Richards

9. WEB SITE (0:02) (Sean Cunningham) <https://tc0301.ashraetcs.org>

Action: Update from Sean Cunningham

10. OLD BUSINESS

10.1 125 Year Historical Celebration for ASHRAE

Is there any topic 3.1 would like to collaborate on to support this celebration. 30 page limit on conference papers.

11. NEW BUSINESS

None

12. NEXT MEETING

2018 ASHRAE Annual Meeting; Atlanta, Georgia.
TC 3.1 will meet Monday, January 14.

13. ADJOURN

ATTACHMENTS:

1. Draft minutes: Chicago
2. Research Plan: