

DRAFT Minutes
TC 2.3 - Gaseous Contaminants/Removal Equipment
Research Subcommittee Meeting
Monday, February 2, 2026 4:30-6:30 PT
Room: Caesars Palace, Modena (P)

1 Call to order 4:31

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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.

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

- 2 Introductions and sign-in sheets- total of 31 attendees
- 3 Randy Cooper, AHAM- Ask for research help. Did AHAM and ASTM D8625 none of the systems that were tested on these for comparison- no byproducts measured. Does anyone know of something that may generate byproducts? Could be related to the gases being tested- may not generate byproducts.
- 4 Review of Minutes of Summer Meeting- any corrections? No corrections or comments
- 5 Chair Comments-Research Chair Breakfast
 - a. ASHRAE Research strategic plan is still being developed
 - b. 2.8 million raised last year, 5.8 % ahead of budget for this year- goes to research ONLY
 - c. Research budget for 25-26 \$4.012 M
 - d. Since last meeting- 3 RTAR, 3 WSs, 6 TRP under review (2 of the 3 WS were from TC 2.3!)
 - e. Invite 2 RAC members to all PES/PMS meetings
 - f. RAC can approve up to \$350K
 - g. Training for members new to ASHRAE research- will provide more information when finalized
 - h. Portal for submitting RTAR and WS digitally
 - i. Starting for March 15th deadline- would like all NEW RTARs to be submitted through portal
 - ii. Process is still similar, just final submission is through portal
- 6 RAC report (Liaison TC 2.3- Brian Fricke) Not at meeting

7 Active Projects:

- a. **RP-1869:** Evaluation of Indoor Air Contaminants with respect to Development of a Revised Indoor Air Quality Procedure (IAQP) Design Compound and Design Target Lists for Standard 62.1. (Co-sponsored: 62.1 & TRG4). Champion: Gemma Kerr.
Gemma- On time and on budget.
About ½ through time, final report Nov of this year. On track. Have collected all the data- lit review. 315 VOCs reported, 42 countries, over 10,000 data points. Look for every guideline for IAQ- can use for design limits. Highest concentrations relative to lowest guideline limits- to update the IAQP list of compounds. Database- ASHRAE plan to publish it? Unknown if there will be a fee (1/27/26) Some delays in finding citations for data analysis procedures lead to a 6-month no-cost extension requested and granted. The PI will be in Vegas and will report at both TRG-4 IAQP and TC 2.3 Research meetings.
Update from PI on project Report to PMS in April to review. Since last meeting- challenges in putting the data sets together. Discussed approach with PMS. Finalizing QC check and putting together report.
- b. **RP-1928:** Combination duct and chamber test. Chrystal Jolliffe champion, Gemma, Cheng-Seo, and Joe Pessa. (TC 2.9 lead, Co-sponsored: 2.4 and 2.3)
Awarded to LMS, PI Kevin and Kathleen. Kevin (PI)- 2 year project started in April. What can be done to improve Chamber+ duct test standards 185.5 and 145.4. Phase 1 complete. KCl used for testing for mixing- different configurations. Phase 2- first part is complete- testing products all in triplicate (MERV 8, MERV 13, ionizers, ionizer+ MERV 8). Will have a PMS meeting late July early Aug to review data
In the 3rd and final phase of testing. Continuous injection, intermittent injection and added on a chamber mixing test with 1000 ft³ to compare to 4000 ft³ chamber. About 2 more weekends of testing left. Draft report has been sent to PMS (~1/2 report) Next PMS meeting is Feb 26, 2026 at 3 EST (deadline end of April- hoping to meet deadline)
- c. **RP-1913** Study of the Corrosion Impact on Information Technology Equipment in Data Centers Located in Coastal Regions with High Sea Salt Concentration (TC 9.9 lead, Co-sponsored: TC 2.3). Chris Muller is the PES chair, target is to have bids reviewed by end of Feb. PES made recommendation and TC 9.9 Research was supposed to vote in Phoenix.
Chris gave update presentation for PI- Syracuse University. Looking at SO₂, airborne salinity and humidity and combined effects of gas, salt pollution and moisture in the air on IT equipment. Provide thermal guideline for coastal data centers. Lit Review is complete. Starting to build the test facility. PI is looking for in-kind contributions. Mississippi power, Pure Air Filtration and Camfil USA included.
- d. **1895-TRP** Effect of particles on loading on gas filters, with possible interest in looking at other combinations of technologies in the same air cleaner. (Co-sponsors: TC 2.4 and GPC 35)
Got 5 proposals, had to get bid extensions until May.
New PES Chris M. (Chair), Paula, Brian K. Vijay

8 Work Statements (WS) and RTARs

- a. **1858-WS:** sVOCs including how SVOC emissions change with temperature - Sanjeev*, Jianshun Zhang, Kevin Kwong, Kathleen Owen
Work statement was re-written; comments came back and need to be resolved.
Sanjeev has the WS needs help with the cost/ budgeting, then it will be ready to submit.
May 2025- Returned with comments. **Update- Email was sent to RAC Liaison for review, once returned will send out for votes**

- b. **1976-WS** Ozone Removal Efficiency and Generation of Byproducts on VOC-Loaded Gas-Phase Air Cleaning Devices. Menjia Tang – Champion. Volunteers to work with Menjia on WS. Jensen (Co-Sponsor TC 2.4)
Menjia has completed WS, needs members for PES and PMS before can submit: Menjia, Sanjeev, Masih, Caitlin. (Caitlin Chair of PES/ PMS, Masih 2.4 representation) **Returned with comments**
- c. **2008-WS** Effect of Test Concentration and Chemical Composition on Air Cleaner Effectiveness Values in Chamber Testing. Caitlin Naske (Champion). Kathleen Owen, Oliver Dsa, Michael Link, Jesse Ondersma, Gemma Kerr. PES: Caitlin, Kathleen, Gemma, Michael. TC 2.3 lead, (Co-sponsors: SSPC 145, TG2-RAST, SPC 234).
Was written to support need coming out of 145.4 PPR comments **Returned with comments**
- d. **1995- RTAR (previously 1846):** Real Time Small sensors/ affordable: Christopher Vizcaino (champion), Brian K., Fuoad Parvin, Thad Ptak, Jeff Roseberry, Sanjeev H., Jensen Zhang, Jordan Clark, Tony Abate, Marilyn L.
Returned with comments will see if TGIAQMD members want to help (meeting 2/3/26) add Marilyn L. and resend to Sangeev **Ask Chris for update- Emailed 2/11/26)**
- e. **1780-RTAR (TC?, TC 2.3 co-sponsor) (get info from Tori)**

9 Proposed RTARS and other work:

- a. The Effects of Filtration and Air Cleaning on Health & Safety. **Henry G. (Champion)**. Nick Agopian, Lexuan Zhong, Kathleen, Sanjeev, Paula, Brent S. **add Masih, Meng Kong (recruit from TC 2.2)**
1/27/26 Henry -Some work done, have to look back at what was done/ reviewed.
Using AI to compile 15 year database for air cleaning and health effects. Once compiled, will share with group and see where holes are.
- b. **(PAUSE)**Acceptable VOC types and concentrations for inclusion in multi contaminant test gases
Gemma champion, Kathleen, Ashish, Paula, Caitlin, and Jensen
 - i. Gas mixture vs individual gas results, how to interpret data with competition
 - ii. Gemma did background work- how can we get something that is useful for SSPC 145
 - iii. Results of RP-1869 will tell us what VOCs to look at- what are in buildings
 - iv. 2008-WS supporting 145.4 is a starting point for this (gas mixtures). Will pause until results.
- c. Adsorption and emission from particulates in filters, Brian had done a lit search long ago with only a few, maybe newer studies/ research. **Caitlin (champion) Masih will help, Brian, Marilyn, Shichao Liu**
Have joined forces with TC 2.4 to address this for wildfires and other events. Had a few meetings but Caitlin paused while working on 145.4 targeted WS. **Will Email group and restart efforts after winter meeting.**
- d. “Impact of Age on Air Cleaning Devices” Cleaning secondary products from the air- 2.4 lead John Randtke*, Marwa, Jianshun, Brian K, and Jeff Roseberry interested in helping. **Looking for 2.3 co-sponsorship.**
Sent out a draft to TC 2.4- talk to John if interested, plan to use 234 (previously 185.5) for test method. John to get 2nd draft of RTAR ready by May15th.
- e. PFAS is it a particle or a gas, is carbon effective in removing it in air, technology is already used in water, used in a lot of pan and cookware emerging contaminant

Next step: Brian will champion- lit search Chris V. and Paula can help (if you find an article send to Brian) Currently compiling papers and information for lit search RTAR. This is currently a hot topic, may be more a 2.4 topic due to it being SVOC.
There is now a Basecamp folder- send all PFAS references to Caitlin to put in folder (Topic is on Programs for a debate)

f. Ideas for Pheonix

- i. 9.13 Space- looking at gases in spaceships and on the moon and mars/ space. The group is working on a RTAR contaminants- Brian and Marilyn helping (may be asking for co-sponsorship) Arup (Urup) Research Chair of 9.13- get contact from Marilyn
9.13 new RTAR around particles and regenerative filtrations for SPACE (no outside air)
- ii. (Pause) Additional testing for 145.4, By-product testing?
- iii. Jim D. long-term data for characterizing VOCs in buildings and emitting formaldehyde/ other VOCs- how long does it last, what is the length of time, concentration, etc. (from new building materials?) New building and monitor it over time
- iv. Part 2 of RP- lit review of inorganic compounds (other than VOCs)
- v. Wildfires (PTAR?) (TC 5.6 Control of Fire and Smoke)
 1. Urban areas- plastics. Source impacts the contaminants (TC 2.4 idea)
 2. Post fire/ smoldering
 3. Aging of smoke over distances
 4. Looking at not just VOCs but inorganics
- vi. 3D printing- plastic, metal- systems are enclosed. (mitigation is done with exhaust, is carbon used?) Brent Stevens group did some research on the emissions. Does this tie into PFAS exposure? Education of what is included in the emissions (for those who have them in homes, etc.) Committee that deals with exhaust? 5.4 Industrial Processing Air Cleaning (Air Pollution Control)”
Could this be a program? Residential/ schools? Teens impact on your IAQ- vaping, 3D printing, body spray, body odor, lack of doing laundry

g. New Ideas

- i. (PAUSE) Literature review of generation rates/ emissions in spaces- to be used in 62.1 for generation rates (idea from TRG4-IAQP meeting). Will need to wait to see what the VOC list in IAQP is-most likely will be changing in the near future. Might reduce to formaldehyde and benzene?
- ii. Bioeffluents – there isn't any in the IAQP list

10 Adjourn: 6:07