

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING
ENGINEERS, INC.**

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

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TC/TG/MTG/TRG MINUTES COVER SHEET

**(Minutes of all Meetings are to be distributed to all persons listed below within 60
days following the meeting.)**

TC/TG/MTG/TRG
No. TC2.09 DATE: June 26th, 2023

TC/TG/MTG/TRG
TITLE: Ultraviolet Air and Surface Treatment

DATE OF
MEETING: June 26th, 2023 LOCATION: Tampa / Virtual

Name	Affiliation	TC Position	Voting Status	Appointed	End Year
Ashish Mathur	UVDI	Chair	VM	7/1/2022	7/1/2024
Sam Guzman	American Ultraviolet	Vice Chair	VM	7/1/2020	6/30/2024
Aaron Engel	Fresh-Aire UV	Secretary	NVM	7/1/2020	6/30/2023
Larry Fletcher	RGF Environmental	Standards SC Chair	VM	7/1/2021	6/30/2025
Scott Sherwood	Eco Care Corporation	Program SC Chair	VM	7/1/2021	6/30/2025
Robert Coleman	Trane Technologies	Webmaster	VM	7/1/2022	6/30/2026
Matt Middlebrooks	Camfil USA		VM	7/1/2021	6/30/2023
Kevin Kwong	LMS Technologies		VM	7/1/2022	6/30/2026
Steve Welty	Green Clean Air		VM	7/1/2021	6/30/2025
Stephen Martin	CDC/NIOSH	Membership SC Chair	NVM	N/A	N/A
Richard Vincent	Mount Sinai Hospital	Research SC Chair	NVM	N/A	N/A
Katja Auer	American Ultraviolet	Handbook SC Chair	NVM	N/A	N/A

DISTRIBUTION

<i>All Members of TC/TG/MTG/TRG plus the following:</i>	
TAC Section Head:	John Cohen
TAC Chair:	Craig Messmer
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:	Steve Hammerling (Staff Liaison) William Hutzel (Research Liaison) Gerald Kettler (Standards Liaison)
Manager Of Standards Manager Of Research & Technical Services	

ASHRAE Technical Committee 2.9 (TC 2.9)

Ultraviolet Air and Surface Treatment

Main Committee Meeting Minutes

MEETING AGENDA

Tampa, Florida & virtual June 26th, 2023

Monday, June 26th, 2023, at 10:00 AM – 12:00 PM EST

These DRAFT Meeting Minutes have not been approved and are not the official record until approved by the Technical Committee at the Winter 2024 meeting

“TC 2.9 Scope – TC 2.9 is concerned with all aspects of equipment and systems that utilize ultraviolet radiation to destroy or de-activate chemical and/or biological air and surface contaminants in HVAC systems and indoor spaces, including, but not limited to, effectiveness, safety, maintenance, and economics.”

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Review code of ethics / ASHRAE Diversity Commitment

Sign-in sheet distributed in person and on-line

Meeting came to order at 10:00 am EST

Ashish Mathur, TC2.9 Chair opened the meeting

Voting members Present:

Bob Coleman	Kevin Kwong
Ashish Mathur	Steve Welty
Larry Fletcher	Matt Middlebrooks
Sam Guzman	Scott Sherwood

**Roll Call of Voting members: 6 of 8 voting members present (quorum is met)
which two members from the 8 voting members were not present?**

Introductions – Name and affiliation of participants

Review Agenda: All in favor

Review of Draft Minutes from 2023 Winter Meeting / Virtual Conference

Motion to approve the 2023 Winter meeting / Virtual Conference minutes by Sam Guzman, 2nd by David Kevin Kwong.

Date	Topic	Motion	Vote					
			F	Ag	Ab	NV	CV	
7/26/23	Approve the 2023 Winter meeting agenda.	Approve Winter 2023 TC 2.9 agenda	6	0	0	0	Y	PASS

Review Action Items from TC Chair breakfast highlights

- World trend in moving towards decarbonization and whole-Life carbon
 - ASHRAE Task Force for Building Decarbonization (TFBD) - encourage involvement/liaison with the 7 working groups which are part of the task force.
 - *It is essential for interested TCs to be familiar with ASHRAE’s decarbonization activities and provide their expertise to those activities.*
 - *TC liaisons are to keep abreast of the subject matter development and provide communication that facilitates a working relationship between the TFBD WG and the TC now and a smooth transition in the future. The liaison should update the*

TC at least twice a year on the activities of the TFBD working group. Scott Sherwood and **Ryan Last name?** have volunteered represent TC2.9

- Knowledge Resource Hub www.ashrae.org/decarb
- Overview of ASHRAE's Government affairs (GAC): www.ashrae.org/GovAffairs
 - ASHRAE is a leading source for expertise in the built environment and a resource for policy-makers in the development of legislation and regulations affecting the public, the HVAC&R community, and the engineering profession.
 - ETF recommendations adopted by White House Clean Air initiative, EPA/CDC guidance
 - Several bills and standards adopted by various states across US
 - GSA office of high-performance buildings-focusing on ASHRAE 241P- piloting 5 bldgs
 - Letters, testimony, responses etc. Technical input sought –Bill Bahnfleth has testified to the White House
 - ASHRAE getting grants to adopt and enforce energy standards and carbon activities.

Subcommittee Reports

Research Subcommittee: Richard Vincent, SC Chair

- ASHRAE memorandum of understanding with other groups such as ~~HARI~~AHRI and IUVA. Potentially overlap with other groups with MOUs with ASHRAE in UV area. Topics that came up with IUVA that they may overlap with TC2.9. Good overlap with co-funding or new ideas to work with these groups.
- Great work in last few years is advancement of standard 185. ~~These standards~~ 185.3 ~~standard~~ ~~standard was~~ recently ~~approved~~ ~~submitted for public comments~~ ~~Linda Lee~~ ~~committee round-robin~~. ~~Standard and develop~~ RTAR, ~~looking~~ Looking for champion to write the RTAR for 185.3 and 185.1. 185.3 testing aerosolized bioaerosols. Tom Dunbar will champion the RTAR.
- On-going literature search and identify gaps on rate constant. Next topic is trying to look at different "k" values to study under a standardized condition. Test in duct and how humidity and other environmental conditions can affect outcome. The champion is Lexan.
- Understanding photochemistry with different UV wavelengths. Hank and Kevin will champion. Hank suggests possible Dean Tompkins, Nick Agopian, Nick S. from Syracuse, Kevin from LMS, Jeff from Pro~~mark~~. One RTAR will cover all wavelengths / what literature is available for "K" values. Aaron Engel also showed interest in joining. Co-sponsor with TC 2.3, 9.6, 62.1, 241, TG2 -RAST
- DNA tag tracer particles. Steven Martin will champion.
- Funding ~~is available~~ for white paper ~~(PTAR process)~~ ~~e.g.~~ ~~IE~~. Induct application guide. How to go about designing a system.

- What technology should be deployed in different applications? Chamber testing large scale 3K cubic feet, testing various technologies. Keep methodology the same across different test technologies. Testing on Far UV in-room devices, using simulated saliva, we need standard test studies to compare apples to apples. Looking at ionizers, UV, combination of technologies in a device. Get a better understanding of effectiveness and combinations. Reduce risk of disease transmission. Kathleen Ratliff from EPA (close to have a paper to submit of far UV testing).
- Ozone by-product for 222 and change to airborne chemistry.
- Ozone creates ultrafine particles and secondary VOCs

External Research activities:

- Kathleen Ratliff from EPA – tested Far-UV performance.
- NIST- Far-UV secondary aerosol
- JCI-Far UV
- PNNL study of upper-room and Far-UV

Standards Subcommittee: Larry Fletcher, SC Chair

- 185.3 out for public review.
- Kajia 185.4 no status change. Waiting for microbial testing results from NIST.
- GPC37: Richard: continuing to work have next draft at end of August. 90% of guidelines have been drafted.
- 185.1: 3 options: 1) take existing microorganisms and adding MS2, 2) adding MS2 or 3) eliminating current microorganism and using a list of microorganisms provided by manufacturers (Steve Martin)
- 185.5P belongs to the reactive cleaning group.
- 241P: standard was released. Discussion on topic including MS2, clean air flow rate and which technology is most effective. Visibility issues regarding the 241 standards (Hank). People who wanted to join the meeting couldn't. Lots of questions. Limited information available.
- [Healthcare Surface Institute writing ANSI Standard ANSI-for whole room UV disinfection devices in a healthcare setting. Operating and patient rooms. Public review is ~~over~~complete.](#)

Commented [AM1]: Not clear?

Programs Subcommittee: Scott Sherwood, SC Chair

- Scott shared past programs list
- 1 ~~submission for~~ Tampa bay ~~was~~ rejected
- Rejected Tampa program to be re-submitted for Winter 2024 with new language (Bahnfleth and Zaatari)
- Linda Lee submitted title scope and abstract. Title: Testing of air cleaning devices and role of UV. Three speakers
- Wildfires topic. Wildfire IAQ and comfort. Science of wildfires. Effects of woodfire. How to monitor better and affects on HVACR systems.
- How to apply ASHRAE standard 241

- GPC 45P: Complete review of all EPA committees
- Topics for potential 2024 summer/winter Chicago/Indianapolis seminars:
 - How safe is my UVC (Hank)
 - Air exchanges and decarbonization (Troy C.)
 - Building Automation & Control Systems (Linda Lee)
 - How to safeguard public spaces with GUY (Richard V.)
 - Current standards (Larry Fletcher)
 - Pannel discussion: Future of UV disinfection
 - Decarbonization: What's in the air?

Handbook Subcommittee: Katja Auer, SC Chair

- Dean Saputa has been an instrumental member working on various TC2.9 committees and projects including Handbook. We'll miss you Dean!!!
- Kicked off Ch.17. Update 14-page chapter to included new lamp technologies.
- Will work on scheduling meetings.
- Need to use ASHRAE editing portal. Already associated sections to update with members.
- ~~Topics for potential 2024 summer/winter Chicago/Indianapolis seminars:~~
 - ~~How safe is my UVC (Hank)~~
 - ~~Air exchanges and decarbonization (Troy C.)~~
 - ~~Building Automation & Control Systems (Linda Lee)~~
 - ~~How to safeguard public spaces with GUY (Richard V.)~~
 - ~~Current standards (Larry Fletcher)~~
 - ~~Pannel discussion: Future of UV disinfection~~
 - ~~Decarbonization: What's in the air?~~

Handbook Subcommittee, Katja Auer, SC Chair

- Working through updates
- Completion date next 30 days

Membership Subcommittee: Steve Martin, Chair

- 8 voting members
- Aaron E. / Sam G. rolling-off

Bill Bahnfleth: Received distinguished award and answered some questions and extended invitation to reach out on any subject matter to help Bill on content. Congratulations Bill!

Website: Bob Coleman, Webmaster

- Web site is up to date. Base camp available to everyone.

Reports from Liaisons

- **SSPC 62.1, Ventilation for Acceptable Indoor Air Quality**, Brian Hafendorfer. Public review completed.
- **SSPC 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings**, Henry Greist: Reference to UV discussion related to standard 241 and for residential UV that UV can be used to improve IAQ.
- **SSPC 145, Test Method for Assessing the Performance of Gas-Phase Air Cleaning Equipment**, Matt Middlebrooks
- **SSPC 161, Air Quality Within Commercial Aircraft**, Aaron Engel Meeting was later no report
- **TC 2.3, Gaseous Air Contaminants and Gas Contaminant Removal Equipment**, Matt Middlebrooks no report
- **TC 2.4, Particulate Air Contaminants and Particulate Contaminant Removal Equipment**, Kathleen Owen
- **TC 9.6, Healthcare Facilities** - Ashish/Steve W. Included link to:
 - Link to Katherine Ratcliff 2023 paper. Bipolar and PCO testing against MS2.

Reports from Other Liaisons

- US TAG Kevin Won revising test standard
- UL8802 out for ballot (cover portable UV)
- UL8803 - looking at UV hazard risk, electrical, shock, fire
- IES: Richard Vincent: no updates RP 44 . RP 27.1

Ashish-TC 2.9 has to address comments as it relates to 62.1 "What do we use for UV lamps?". A meeting with voting members followed the main meeting.

Motion to adjourn by Ashish Mathur. Meeting was adjourned at 12PM