

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

ASHRAE Value Statement – 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.

PURPOSE:

The focus of the **Standards Subcommittee** is on the writing and continued maintenance of standards and guidelines written for HVAC&R air filtration. This group not only reviews ASHRAE standard and guidelines but also keeps an active reporting system of HVAC&R standards and guidelines produced by other organizations and other countries around the world.

This TC is Cognizant for the following standards

1. CALL TO ORDER

- A. Introductions
- B. Chair's comments
 - i. Introduced Scott Parris as vice chair
 - ii. Scott Parris conducted the TC2.4 Standards Sub-committee

2. UPDATE ON STANDARDS, GUIDELINES, AND MTGS WITHIN SCOPE OF TC 2.4

- A. SSPC 52.2 - Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size (Todd McGrath)
 - i. Per Todd McGrath, 52.2 ANSI reprint scheduled for this year.
 - ii. Thad Ptak working with a team to collect data to evaluate 52.2 test equipment accuracy. A survey is being distributed.
 - iii. Kathleen Owen fielded questions from attendees concerning results from the latest round robin data analysis. She is soliciting independent reviews to publish the results.
 - iv. See 52.2 meeting minutes for details.
- B. GPC 35P - Method for Determining the Energy Consumption Caused By Air-Cleaning and Filtration Devices (Geoff Crosby)
 - i. Purdue University test lab visit occurred on Thursday June 20, 2024. Thank you, Brandon Boor for hosting the ASHRAE GPC 35P team.

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

- ii. [Standard is pending conclusion of RP1734 Phase 2 report, 3rd revision. Reproducing A Representative Urban Atmospheric Aerosol Distribution...](#)
- iii. [See GPC 35P meeting minutes for details.](#)

3. ASHRAE LIAISONS

- A. TC 2.3 Gaseous Air Contaminants and Gas Contaminant Removal Equipment (Kevin K)
 - i. SSPC 145.1 - Laboratory Test Method for Assessing the Performance of Gas-Phase Air Cleaning Systems: Loose Granular Media
[\(1\) No update](#)
 - ii. SSPC 145.2 - Laboratory Test Method for Assessing the Performance of Gas-Phase Air Cleaning Systems: Air Cleaning Devices
[\(1\) No update](#)
- B. TC 2.9 Ultraviolet Air and Surface Treatment (Kathleen Owen)
 - i. SSPC 185.1 - Method of Testing UVC Lights for Use in Air Handling Units or Air Ducts to Inactivate Airborne Microorganisms
[\(1\) No update](#)
 - ii. SSPC 185.2 - Method of Testing Ultraviolet Lamps for Use in HVAC&R Units or Air Ducts to Inactivate Microorganisms on Irradiated Surfaces
[\(1\) No Update](#)
 - iii. SPC 185.3P, Method of Testing In-Room Devices and Systems for Microorganism Removal or Inactivation in a Chamber.
[\(1\) No update](#)
 - iv. SPC 185.4P Method of Testing In-Room Ultraviolet Devices and Systems for Microbial Inactivation on Surfaces in a Test Room
[\(1\) No update](#)
 - v. SPC 185.5P Method of Testing HVAC-duct mounted Devices and Systems and In-Room devices for Particle and Microorganism Removal or Inactivation in a Chamber with a Recirculating Duct System
[\(1\) No update](#)
- C. TC 5.4 Industrial Process Air Cleaning (Need Liaison)

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

- i. SPC 199 - Method of Testing the Performance of Industrial Pulse Cleaned Dust Collectors
 - (1) Per Geoff Crosby the standard will be out for public review prior to Winter 2025 conference.

- D. TC 9.6 Healthcare Facilities
 - i. SSPC 170 - Ventilation of Health Care Facilities (Need liaison)
 - (1) Update per Jenny Berens.
 - (2) Mark Davidson has proposed creating a SSPC170 Filtration Subcommittee

- E. SSPC 62.1 - Ventilation for Acceptable (Commercial) Indoor Air Quality (Jon Rajala)
 - i. No new information.

- F. SSPC 62.2 - Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings (Jon Rajala)
 - i. Updated filter efficiency requirement to MERV13.
 - ii. Ready to send out for public review.

- G. SSPC 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings
 - i. No update

- H. SSPC 90.2 – Energy Efficient Design of Low-Rise Residential Buildings (Palo Tronville)
 - i. Addendum G requiring filter efficiency of MERV13.

- I. US TAG to ISO/TC 142 - Cleaning equipment for air and other gases (Jon Rajala)
 - i. Jon to forward updates via e-mail.
 - a. WG 1 (Terminology) – OPEN APC
 - b. WG 2 (UV-C) – Katja Auer (APC)
 - c. WG 3 (General Ventilation) – Don Thornburg (Convener) & OPEN APC
 - d. WG 4 (HEPA/ULPA) –R. Vijayakumar (Convener) & Andy Stillo (APC)
 - e. WG 5 (Dust Collectors) – Open APC
 - f. WG 7 (Durability of Cleanable Filter Media) – OPEN APC
 - g. WG 8 (Gas Phase) – Matt Middlebrooks (APC)
 - h. WG 9 (Gas Turbine) – OPEN APC
 - i. WG 10 (Nuclear) – Satish Dinakaran (APC)
 - j. WG 11 (Portable Air Cleaners) – OPEN APC

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

- k. WG 12 (Sustainability) – Geoff Crosby (APC) & Jon Rajala (Acting APC)
 - l. WG 13 (Biological equipment for waste gas) – OPEN APC
 - m. WG 14 – Test Method for Airborne Microorganism Filtration Efficiency and Decontamination Efficiency
-
- J. SSPC 241 Control of Infectious Aerosols (Mike Corbat)
 - i. [Committee meeting 6/24/24 3:00pm](#)

 - K. TC 4.10 (Sina Yousefi?)
 - i. [No update](#)

 - L. TG2.RAST (Kevin)
 - i. [Draft is complete and needs final edit to get ready for public review. Target Winter 2025 meeting.](#)
-
- 4. TC 7.3 lead for the following standard (Co-Cognizant)
 - A. ANSI/ASHRAE/ACCA 180: Standard Practice for Inspection and Maintenance of Commercial-Building HVAC Systems
 - i. [No update](#)

2024 0626

IEC/TC59/SC/59N Activities (KJ Choi Updates)

JWG 1

- **JWG 1 Reduction of Particles** (Stefan Schumacher)
 - [IEC 63086 Part 2-1 on Measurement of Reduction of Particles by an Air Cleaner was published. Preparation for future revision.](#)
- **SWG 1.1 Performance Change with System Loading** (K C Noh)
 - [Currently drafting of CD document. Discussion on change to OSD format.](#)

JWG 2

- **JWG 2 Determination of gas-phase pollutant reduction** (Dr. Atsuo Nozaki / Yoshio Okamoto) CDV draft - IEC 63086-2-2 ED1: Household and similar electrical air cleaning appliances - Method for measuring performance - Part 2-2: Particular requirements for determination of gas-phase pollutant reduction.
- **SWG 2.1 Reduction of Ozone** (Jinzhu Ma) working on draft CD. Possibly developing a separate standard (IEC 63086-2-7) for static without dynamic.
- **SWG 2.2 Performance Change with System Loading Gas Phase Pollutants**, currently PWI stage.

JWG 3

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

- **JWG3 Reduction of Microorganisms** (Zhang Xiao)
 - Working on CD draft: Part 2-3 (IEC 63086-2-3): Particular requirements for reduction of microorganisms. Comparing CD draft with PAS based on AHAM AC-5.

JWG 4; General Characteristics (John Park (US))

- **SWG 4.1 Measurement of Acoustical Airborne Noise**
 - Lead = Richard Deane (UK)
 - Working in conjunction with TC 59/WG 2 to maintain IEC 60704-2-19
 - A CD ballot comment requires RRT to address the concerns on uncertainties.
 - 6 labs have volunteered for RRT:
 - Germany (2), Japan (1), Sweden (1), UK (1) and US (1)
 - RRT is ongoing per the schedule labs agreed with.
 - Three test units for RRT:
 - Regular Air Cleaner: Philips 800 Series
 - Taller air cleaner: LG Puricare 360
 - Diffuse/directional: Dyson Pure Cool™ purifying fan
 - Next meeting is upon the completion of the RRT.
- **SWG 4.2 Methods to Operate Round Robin Testing**
 - Lead = Connor Hoover (US)
 - IEC TR 63250 is to be used as the guidance document for the individual Part 2's. No formal technical report will be produced.
 - Reference unit is Amway Atmosphere Sky 120539.
 - Resource files have been created, and under development for use:
 - Laboratory Questionnaire – ready for recirculation
 - Inter Lab Test Program Guidelines – Air Cleaner – under review
 - Laboratory scoring – ready
 - Datasheet for Part 2 on Particles – in review
 - Statistics sheet for analysis – in review
 - *** These are the tools for all SC 59N when conducting RRT. ***
 - Next meeting = 6/26 (W) tentatively
- **SWG 4.4 Measurement in Automatic Mode**
 - Lead = Dan Miller (US)
 - Scope in discussion, focusing on the perspectives of performance control and energy savings by automatic mode:
 - Time to kick-in, clean, and stop; concentration for each step; then energy use for such operations
 - New direction from the 4/23 meeting discussion
 - What is the metric, in other words, what are we measuring as to the *performance* of automode?
 - Next meeting = 6/5 (W)
- **SWG 4.5 Methods to Measure Energy Efficiency**
 - Lead = John Park (US)
 - IEC 63086-3-XX TS (59N/11/NP)
 - NP approved by 5 NC's
 - RVNTS submitted
 - Discussion on new direction:
 - Energy efficiency than power/energy
 - IEC 63086-2-4 than Technical Specification
 - Cancel 59N/11/NP, and submit a new NP.
 - Next meeting = 6/12 (W)

JWG 5; Special types of air cleaners

- **SWG 5.1 Fresh Air, Air Cleaners** (Shanshan Li)
 - Reached consensus to stop and restart this project due to 5 yr limit.
 - Preparing preliminary NP (Test method verification for fresh-air cleaner)
- **SWG 5.2 Robotic/Mobile Air Cleaners**
 - Brief introduction about the market, technology and test method of robotic air cleaners was made.

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

- Main focus is on the comprehensive cleaning and mobile index and relative test methods.
- Distributed list of reference standards and CADR test methods, waiting for the feedback before further discussion.

JMT 6; Joint Maintenance Team 6 (Wayne Morris)

- Joint Maintenance Team 6 is responsible for the IEC Part 1 Standard, 63086-1 (published in 2020)
- Recently, IEC 63086-1 was Amended (Amendment 1) which corrected some typographical errors and clarified the scope (published in 2023)
 - There is great desire to update the Part 1 document and to have it considered by ISO TC 142 for dual logo
 - Following Amendment 1, Joint Maintenance Team 6 (JMT6) was reformed with representatives from ISO TC 142
 - Move Part 1 to OSD
 - Includes larger chamber.
 - Discussed a draft NP on new revision including outline of list of sections to be considered for change.

IEC TC 59/SC59N, Decisions of Plenary, 26 April 2024

- ISO 16000-36:20018 Indoor Air—Part 36: Standards method for assessing the reduction rate of culturable airborne bacteria by air purifiers using a test chamber
- ISO 16000-44:2023 Indoor air—Part 44: Test method for measuring perceived indoor air quality for use in testing the performance of gas phase air cleaners
- ISO 16000-43 Indoor Air—Part 43: Standard method for assessing the reduction rate of culturable airborne fungi by air purifiers using a test chamber (under development, passed enquiry stage)

“No future developments of air cleaner performance test method standards should be developed by ISO TC 146. This work should be done together with IEC TC59, SC59N and under direction of SC59N for double-logo standards.

“Experts from ISO TC 146 are invited to participate in Liaison standards development with IEC SC59N as ISO TC 142 has been working with IEC 59, SC59N for 5 years.”

5. OLD BUSINESS

- A. MTG, GPC for implementing cleaning technologies in combination; collaboration between TCs 2.4, 2.3, 2.9 (Brian K)
 - i. Recommend techniques...

6. NEW BUSINESS

- A. Need liaison for ANSI/ASHRAE/ACCA 180 –
- B. Need liaison for IEC & AHAM
- C. Brian recommended for the committee to list out cognizant guidelines.
- D. Decarbonization Grants to look at system component life. \$2 million dollars being allocated. Looking for research ideas. (Palo Tronville)
- E. Jeff Siegel – Availability of ASHRAE standards to academic institutions. Recent changes in standards suppliers have resulted in large price increases

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

7. INFORMATION EXCHANGE

- A. AFS (John Rajala, Rahul Bharadwaj)
- B. CEN/TC 195 – Cleaning equipment for air and other gases (Paolo Tronville)
- C. EUROVENT (Paolo Tronville) – aging procedure with fine particles
- D. IEST – Institute of Environmental Sciences and Technology – no update
- E. AHRI 680 – Sanjeev and Chrystal. Working on updating
- F. INDA – International Nonwovens Development Association (Tom Justice)
 - i. FiltXPO – April 29-May 1 2025 Miami Beach
- G. NAFA
 - i. 2025 Technical Seminar Tempe, AZ April 1-3
 - ii. 2025 Annual Convention Newport, RI Oct 21-23
- H. ISO/TC 22/SC 34 - Road vehicles - Propulsion, powertrain and powertrain fluids (Paolo Tronville, Bruce McDonald)
 - i. WG3 – Air filters
 - ii. Standard 12103 Part 3 – Published Standard
 - iii. Urban loading aerosol being developed
 - iv. Working on test method to utilize soot as an aerosol (95 nm to 105 nm)
- I. UL 900 (Randall Haseman)
- J. IAQ Meetings (Jeffrey Siegel)
 - 2024
- K. FILTECH Expo and Conference
 - i. Jun 30- Jul 2, 2026 Cologne, Germany
- L. Indoor Air Conference (ISIAQ)
 - i. Next will be July 7-11 2024 - Honolulu
- M. American Association for Aerosol Research
 - i. 10-21 – 10/25 Alb, NM
- N. International Aerosol Conference
 - i. 2026 China– Sept (1st week)
- O. Asia Filtration Show / FILTREX
 - i. TBD
- P. World Filtration Congress
 - i. June 2025 Bordeaux France
- Q. World Congress of Particle Technology
 - i. No info

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

- R. Korean Filtration and Separation Society 2024 Annual Conference, November 4 – 5, 2024 at Jeonbuk National University
- S. Waterloo Filtration Institute (Jenny) Dec 3rd 4 Online
- T. Healthy Buildings
- U. ANEX 2024 May 22-24 Taiwan

8. ATTENDANCE –

NAME	EMAIL	CO.
Scott Paris	scott.paris@freudenberg-filter.com	
K-J Choi	kchoi228@gmail.com	
B. Krafthefer	bkrafthefer@gmail.com	
Tom Justice	justfilter@yahoo.com	
Yasar Kiyat	yasar.kiyat@mativ.com	
John Randtke	john.randtke@se.com	
Andrew Mourgenos	amourgenos@alkegen.com	
Jon Rajala	JRAJALA@AAFINTL.COM	
Paolo TRONVILLE	paolo.tronville@polito.it	
Jeni Wong	jiwong@rensafiltration.com	
Todd McGrath	tmcgrath@glasfloss.com	
Lu Liu	lu.liu1@parker.com	
KEITH CHESON	KEITH.CHESON@PARKER.COM	
Geoff Choudry	GEOFF.CHOUDRY@INMA.DE	
Mark Tucker	mtucker3034@icloud.com	
Brant Chamberlain	bchamberlain@kochfilter.com	
Mark Varady	mark.varady@kcc.com	
Dean Bovessi	Dean.Bovessi@kcc.com	
Daniel Rush	daniel.rush@utexas.edu	
Jenny Berens	jenny.berens@freudenberg-filter.com	
Daniel Miller	daniel.miller@sgs.com	
Christine Sun	sun@wfi.us.org	

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, February 9, 2025
Hilton Orlando - Championsgate

	Name	Company/Address	Email
1	Bobby Singer	BHT	
2	Todd Mcgrath	Glasfloss	tmcgrath@glasfloss.com
3	Jenny Berens	FFT	Jenny.berens@freudenberg-filter.com
4	Sissi Liu	Metalmark	sissi@metalmark.xyz
5	Sergio Gonzalez	Glasfloss	sgonzales@glasfloss.com
6	Andrew Mourgenos	Alkegen	amourgenos@alkegen.com
7	Amy Li	U of Waterloo	Tianyuan.li@waterloo.ca
8	Don Thornburg	Camfil	Don.Thornburg@camfil.com
9	Jeff Siegel	U of Toronto	Jeffrey.siegel@utoronto.ca
10	Mark Tucker	Mativ	Mtucker3034@icloud.com
11	Jon Rajala	AAF	jrajala@aafintl.com
12	Keith Chesson	Parker	Keith.chesson@parker.com
13	Jeni Wong	Custom Filter	jwong@customfilter.net
14	KJ Choi	Clean and Science	Kchoi228@gmail.com
15	Christine Sun	WFI	sun@wfius.org
16	Dong Zhong	TRJ	dzhang@charter.net
17			
18			
19			
20			
21			
22			
23			
24			