

TC 2.4 STANDARDS SUBCOMMITTEE

Agenda

Sunday 2:00PM – 3:00PM, June 23, 2024
JW Marriott White River IJ

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.

1. CALL TO ORDER

- A. Introductions
- B. Chair's comments
 - i. Introduce Scott Paris as vice chair

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. Thad Ptak presentation on possibly assigning accuracy / uncertainty / tolerance values to 52.2. Will come back with details
 - ii. Task force headed by Don T to investigate improvement/changing of App J conditioning procedure
 - iii. Re-formatting / re-writing of standard complete – Public Review
- B. GPC 35P - Method for Determining the Energy Consumption Caused By Air-Cleaning and Filtration Devices (Geoff Crosby)

GPC 35 has not met since the summer meeting. Purdue University has completed the physical research work position of 1734RP and is in the process of writing their final report. A deliverable of that report is the loading protocol that will be part of the Guideline. We expect that report to be completed and approved by this spring.

GPC 35 will be scheduling a virtual meeting to follow that approval and begin implementing the loading procedure into the written guideline.

GPC 35 is also planning to hold an in-person committee working meeting at Purdue University, the current proposed date is on Thursday June 20, 2024. We will have a chance to view the test duct and a loading procedure, and continue work on the guideline, having seen the actual operation.

3. ASHRAE LIAISONS

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- 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) Approved update of definitions
 - ii. SSPC 145.2 - Laboratory Test Method for Assessing the Performance of Gas-Phase Air Cleaning Systems: Air Cleaning Devices
 - (1) Kathleen working on re-write to incorporate non-sorbent units
 - (2) New title purpose and scope

145.4P-draft is almost complete?
- 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
 - 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
- 4. **SPC 185.3P**, Proposed Standard authorized May 2021. Standard 185.3P to be developed by SSPC 185.
Method of Testing In-Room Devices and Systems for Microorganism Removal or Inactivation in a Chamber.

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5. 1. PURPOSE

The standard establishes a method of test for evaluating in-room devices and systems for microorganism removal or inactivation in a chamber.

6. 2. SCOPE:

2.1 The method of test specifies selected indicator microorganisms in the test chamber and defines procedures for generating the bioaerosols required for the method of test.

2.2 This standard provides a method for counting the number of viable microorganisms in the chamber to calculate the elimination efficiency for each microorganism.

2.3 This standard establishes minimum performance specifications for the equipment required to conduct the tests, defines methods of calculating and reporting results obtained from the test data, and establishes a reporting system to be applied to in-room devices and systems covered herein.

2.4 This standard does not address the health and safety effects of operating devices and systems in an occupied room.

Standard 185.4P – Proposed Standard authorized November 2021. Standard 185.4P to be developed by SSPC 185.

Method of Testing In-Room Ultraviolet Devices and Systems for Microbial Inactivation on Surfaces in a Test Room

PURPOSE: This standard establishes a test method for evaluating the efficacy of ultraviolet disinfection systems for microbial inactivation on multiple surface locations in a test room.

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SCOPE:

2.1 The standard applies to ultraviolet devices and systems using only germicidal ultraviolet energy for disinfection.

2.2 The method of test specifies selected indicator microorganisms and defines procedures for inoculating test carriers in a room-scale test chamber.

2.3 The method of test defines the test carrier quantity and positions in the test room.

2.4 This standard provides a method for counting the number of viable microorganisms on the test carriers before and after ultraviolet inactivation.

2.5 This standard establishes protocols and minimum requirements for the materials and equipment required to conduct the tests, defines methods of calculating and reporting results obtained from the test data, and establishes a reporting system to be applied to in-room devices and systems covered herein.

- i. **2.6** This standard does not address the health and safety effects of operating devices and systems in an occupied room.

ASHRAE 185.5

B. TC 5.4 Industrial Process Air Cleaning (Need Liaison)

- i. SPC 199 - Method of Testing the Performance of Industrial Pulse Cleaned Dust Collectors

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(1)

C. TC 9.6 Healthcare Facilities

i. SSPC 170 - Ventilation of Health Care Facilities (Jenny)

(1) No update

(2) Looking for liaison

(3) Haven't met as of this meeting (meeting 1-23)

D. SSPC 62.1 - Ventilation for Acceptable (Commercial) Indoor Air Quality

i. Liaison – Jon Rajala!!!

ii. Effort now going into IAQ Guide 42P – Intent to provide guidance on how to go above minimal acceptable IAQ

E. SSPC 62.2 - Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

i. No update

ii. Jon can help

F. SSPC 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings

i. No update

G. US TAG to ISO/TC 142 - Cleaning equipment for air and other gases (Jon Rajala)

a. WG 1 (Terminology) – OPEN APC

i. [2-22-23 - N0942 - ISO 29464 \(Ed.3\) for registration at DIS stage](#)

ii. [The document N0942-ISO 29464 \(Ed. 3\) has been released for registration but has not yet been registered. It has not yet undergone the TAG ballot process.](#)

b. WG 2 (UV-C) – Katja Auer (APC)

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- i. No new updates
- c. WG 3 (General Ventilation) – Don Thornburg (Convener) & OPEN APC
 - i. No new updates
- d. WG 4 (HEPA/ULPA) –R. Vijayakumar (Convener) & Andy Stillo (APC)
 - i. The US TAG has recommended confirming ISO 29468-2, ISO 29468-3, and ISO 29468-4. ISO 29468-1 is expected to undergo the ballot process before the plenary meeting.
- e. WG 5 (Dust Collectors) – Open APC
 - i. 4-26-23 – N0958 – ISO 16890-3 (Ed.2) for registration at DIS stage
- f. WG 7 (Durability of Cleanable Filter Media) – OPEN APC
 - i. The group is working on “electrostatic effects of filter materials” as new project; No new updates.
- g. WG 8 (Gas Phase) – Matt Middlebrooks (APC)
 - i. Working on ISO/PWI 23743 “Testing of gas phase air cleaners for improving perceived indoor air quality”
 - ii. No new updates
- h. WG 9 (Gas Turbine) – OPEN APC
 - i. On 2-27-23, the document N0943, ISO 29461-3, was submitted for registration at the DIS stage. Additionally, the document N0944 contains replies to comments received on ISO/CD 29461-3.
 - ii. There is also ISO/PWI 29461-4, which focuses on static filters in marine/offshore applications. A vote was held for a 9-month extension (N0939), and another vote was conducted to modify the language in the title and scope from "marine" to "coastal" (N0949).
 - iii. Currently, the CD stage for ISO/PWI 29461-4 is open for comment until June 10, 2023, as indicated in document N0957.
- i. WG 10 (Nuclear) – Satish Dinakaran (APC)

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- i. A new draft was voted on, but extensive comments were received. The convener of the group is currently reviewing these comments, primarily focusing on addressing editorial errors in the document.
- j. WG 11 (Portable Air Cleaners) – OPEN APC
 - i. 5-24-23 – N0965 - K-J Choi named convener after two round of looking for a new convener.
 - ii. IEC/TC59/SC59N has 5 JwGs and a JMT to do maintenance on IEC/ISO 63086-1.
 - iii. Maintenance is necessary as the group creates other parts to work with the standard.
 - iv. ISO TC 142 approved participating as a JMT, but no experts were submitted to participate. This is good, because the standard will be IEC/ISO rather than just IEC. Standard was originally published without ISO collaboration.
 - v. JWG1 (particles) – 63086-2-1 – Went through CD stage and will soon finalize CDV (meeting today). Decision to submit the revised draft as FDIS 6/15.
 - vi. JWG2 (gases) – 63086-2-2 – Draft CD but may move on in June.
 - vii. Approved NWI proposal to start work on a standard for ozone (63086-2-7)
 - viii. JWG3 (microorganisms) – Preparing a draft for reduction of microorganisms (62086-2-3).
 - ix. Published IEC/PAS 63086-3-1 (publicly available specification) using JEM 1467 as a reference /“pre-standard”, titled “Method for Assessing the Reduction Rate of Key Bioaerosols by Portable Air Cleaners Using an Aerobiology Test Chamber”
 - x. JWG4 (general characteristics) – Has a CD on noise (IEC 60704-2-19). SWG 4-2 working on a round robin test (initially on the particle standard). SWG 4-3 is looking into sensors used with portable air cleaners. SWG 4-4 has started work on testing using the automatic mode (as opposed to max operation mode). SWG 4-5 has NWI proposal for a standard on measurement of electrical power for air cleaners.
 - xi. JWG 5 for special air cleaners – Most work in SWG 5.1 called “Fresh-Air air cleaners”. There are a category common in Asia where the device combines an air cleaner (in the room) with fresh air brought in from outside the room through the device. This work is taking longer than IEC allows for developing a standard, so the work is being stopped

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and will be restarted soon. SWG 5-3 is for mobile robotic air cleaners and this work is in the very preliminary stages.

- xii. Tim Johnson helped provide these updated (much appreciated!), but he is unable to attend this call, and will be phasing out of this work to better enjoy retirement. There have been over 50 virtual meetings per year associated with this work, and 2023 is on the same pace.
- k. WG 12 (Sustainability) – Geoff Crosby (APC) & Jon Rajala (Acting APC)
 - i. No new update. The filter testing is currently underway, and the goal is to complete it by the end of August.
- l. WG 13 (Biological equipment for waste gas) – OPEN APC
 - i. **No activity from US in this WG.**
- m. WG 14 – Test Method for Airborne Microorganism Filtration Efficiency and Decontamination Efficiency
 - i. The NWIP was submitted in November 2021 and presented at the plenary meeting in December 2021. It was officially adopted on April 17, 2022. Currently, the working group is focused on refining the title, purpose, and scope of the project. They aim to shift the emphasis away from "filtration efficiency" to prioritize microorganism decontamination, considering the overlap with ISO 16890. The decision to establish a new working group for this topic was not formalized at the plenary meeting, potentially due to comments from certain country delegates. The Ad-Hoc Group (AHG) is finalizing the title, purpose, and scope before submitting it to ISO TC 142 for a vote.
 - ii. ISO/TC 142/WG 14 Report
 - “NWIP: Test Method for Measuring in-duct Airborne Microorganisms Decontamination Effectiveness (AMDE)” has been circulated to the members to obtain comments from them. A meeting is scheduled on January 30, 2024.

ASHRAE 241 (Corbat)
Has been published

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- H. TC 4.10 (Sina Yousefi?)
 - i. Starting a standard that includes particulates from the modeling aspect
 - ii. Had not met as of this meeting
- I. TG2.RAST (Kevin)
 - i. Had 1st meeting. Formed WG to look at what additional standards would be needed to incorporate air cleaners that aren't currently covered.

IEC/TC59/SC/59N Activities by K-J Choi

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.
- **SWG 1.1 Performance Change with System Loading** (K C Noh)
 - Currently drafting of CD document

JWG 2

- **JWG 2 Determination of gas-phase pollutant reduction** (Dr. Atsuo Nozaki / Yoshio Okamoto) CD 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
- **SWG 2.2 Performance Change with System Loading Gas Phase Pollutants**

JWG 3

- **JWG3 Reduction of Microorganisms** (Zhang Xiao)
 - working on CD draft: Part 2-3: Particular requirements for reduction of microorganisms Discuss.

JWG 4

- **SWG 4.1 Measurement of Acoustical Airborne Noise** (Lead = Richard Deane)
 - Liaison between SC 59N & TC 59/WG 2 maintaining IEC 60704-2-19
 - IEC CDV 60704-2-19 circulation in process

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- RRT is planned in 2023
 - Three (3) test units are ready.
 - Delayed due to insufficient lab participations.
- **SWG 4.2 Round Robin Testing** (Lead = Michael Hudon)
 - Currently finalizing the guidelines and data template to be used for particle reduction RRT in the future.
- **SWG 4.3 Sensor**
 - Decided to disband early this year.
- **SWG 4.4 Automatic mode** (Lead = Dan Miller)
 - 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.
- **SWG 4.5 Method to measure energy efficiency** (Lead = John Park)
 - IEC 63086-3-XX TS (59N/11/NP) approved.
 - Alignment with AHAM AC-7
 - Scope to develop technical specification for measuring power/energy is changing to Part 2 standard for energy efficiency.

JWG 5; Special types of air cleaners

- **SWG 5.1 Fresh Air, Air Cleaners** (Shanshan Li)
 - Reached consensus to stop and restart this project
 - Preparing NP
- **SWG 5.2 Robotic/Mobile Air Cleaners**
 - Brief introduction about the market, technology and test method of robotic air cleaners was made.
 - Main focus is on the comprehensive cleaning and mobile index and relative test methods.
 - Working on NP

JMT 6; Joint Maintenance Team 6 (Wayne Morris)

- Joint Maintenance Team 6 is responsible for the IEC Part 1 Standard, 63086-1
- Recently, IEC 63086-1 was Amended (Amendment 1) which corrected some typographical errors and clarified the scope.
 - 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
 - A few general meetings have been held, next one 11 October 2023
 - Two issues
 - Open the full IEC 63086-1 to review by ISO TC 142
 - Consider changes to accommodate different size chambers

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- 30m3 chamber in existing Part 1 have limitations.
- Study groups have indicated it is limited to about 1000 m3/hr CADR.
- Larger air cleaners are appearing on market. Discussing alternate chambers, other than the current 30m3 chamber.

7. 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...

8. NEW BUSINESS

- A. Need liaison for ANSI/ASHRAE/ACCA 180 –

9. INFORMATION EXCHANGE

- A. AFS (John Rajala, Rahul Bharadwaj)
 - (1) Moved from 2 per year to annually
 - (2) Filtcon 2024 April 8-10 Houston
- B. CEN/TC 195 – Cleaning equipment for air and other gases (Paolo Tronville)

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- 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. 2024 Technical Seminar April 17-19 Dallas
 - ii. 2024 Annual Convention Oct 1-3 Maui
- 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. Nov 12-14 2024 Cologne, Germany
- L. Indoor Air Conference (ISIAQ)
 - i. Next will be July 7-11 2024 - Honolulu
- M. American Association for Aerosol Research

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- 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
- 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

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.

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This TC is Cognizant for the following standards

ANSI/ASHRAE Standard 52.2: Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size

ANSI/ASHRAE Standard 185.1: Method of Testing UVC Lights for Use in Air Handling Units or Air Ducts to Inactivate Airborne Microorganisms.

This TC is CoCognizant with TC 7.3 lead for the following standard

ANSI/ASHRAE/ACCA 180: Standard Practice for Inspection and Maintenance of Commercial-Building HVAC Systems

10. ATTENDANCE –

	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

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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
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