



**MINUTES**

**BOARD OF DIRECTORS MEETING**

**INDIANAPOLIS, IN  
Wednesday, June 26, 2024**

**Approved by the Board of Directors on November 6, 2024.**

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Wednesday, June 26, 2024

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**PRINCIPAL APPROVED MOTIONS**

Board of Directors Meeting

Wednesday, June 26, 2024

No. - Pg.	Motion
1 - 4	<p>The following be approved as a consent motion:</p> <ul style="list-style-type: none"> <li>A. That Fiducient Advisors LLC be approved as ASHRAE investment advisor for fiscal year 2024-2025.</li> <li>B. That Jones and Kolb be approved as ASHRAE Certified Public Accountants for fiscal year 2024-2025.</li> <li>C. That the appropriate and required bank resolutions for institutions in which ASHRAE funds are deposited as executed by officers for fiscal year 2024-2025 be approved.</li> <li>D. That King &amp; Spalding LLP and Holland &amp; Knight LLP be retained as ASHRAE legal counsel for fiscal year 2024-2025.</li> </ul>
2 - 4	<p>Members Council recommends to the Board of Directors that the revision to the ROB as shown below be approved.</p> <p><b>2.402 GOVERNMENT AFFAIRS COMMITTEE</b></p> <p>2.402.002.1 Composition</p> <p>The members of this committee are as follows:</p> <p>A. Voting members, including a Chair and one Vice chair, a Communications Coordinator, one representative from each Region who serves as Regional Vice Chair, one representative from each Council (Technology Council, Members Council, Publishing and Education Council) and four (4) at-large members.</p> <p>...</p> <p>2.402.002.3 Term of Service</p> <p>The term of service for The Chair, <del>the</del> and Vice Chairs, <del>and Council</del> <u>Representatives</u> shall be one year. The term of service for the other voting members shall be three years, subject to ROB 3.300 <i>Election and Appointment Procedures</i>.</p>
3 - 5	<p>PEC recommends the BOD approve changes to the Publication’s Committee section of the ASHRAE Rule of the Board (ROB) as shown below:</p> <p>2.419.003.1</p> <p>...</p> <p>B. ASHRAE shall produce Special Publications that shall be defined as all technical publications in print format (except for the ASHRAE Handbook series; standards, guidelines, and user’s manuals; ASHRAE’s research journal, and ASHRAE’s magazines), such as <del>non-series</del> books (including books resulting from ASHRAE Research Projects and Special Projects), <del>books in the Advanced Energy Design Guide series and the ASHRAE Datacom Series</del>, charts, and tools, as well as all technical publications in machine-readable format, such as audio and visual presentations,</p>

	<p>software, databases, apps, and online resources. These special publications may be generated from proposals submitted directly to Publications Committee or from accepted Publication Topic Acceptance Requests (PTARs), which Publications Committee reviews before providing recommendations to Research Administration Committee (RAC) for the final vote regarding funding. <u>This committee shall also communicate with the cognizant TCs of existing ASHRAE publications to help staff determine whether older publications are up to date as is, need to be revised, or need to be removed from sale.</u></p> <p>...</p> <p>D. The objective of <i>ASHRAE Journal</i> shall be to lead in communication of heating, ventilating, air-conditioning and refrigeration information to and from the profession, industry, and related interests. (ROB 520-144-007). Editorial and advertising content of <i>ASHRAE Journal</i> shall be directed toward the professional education of persons engaged in industries related to heating, ventilating, air conditioning, and refrigeration. (86-06-22-18L). <u>This committee shall determine the annual winner of the Journal Paper Award.</u></p>
<p><b>4 - 6</b></p>	<p>To create a unified learning platform to support ASHRAE eLearning, instructor-led training, and self-directed learning offerings and enhance the user experience for ASHRAE members and the wider public, funded by the General Reserve Fund.</p>
<p><b>5 - 7</b></p>	<p>Technology Council recommends to the Board of Directors that the Rule of the Board be revised and a new section be added as follows:</p> <p><u>2.106.001.12 Indoor Environmental Quality Global Alliance (IEQ-GA)</u></p> <p><u>2.106.001.12.1 Membership</u></p> <p><u>a. ASHRAE is a founding Full Member of the Indoor Environmental Quality Global Alliance (IEQGA) a consortium of organizations incorporated in Belgium and shall pay annual dues to maintain its continuing membership.</u></p> <p><u>b. Membership is subject to review every five years, to be completed in each calendar year ending in either 4 or 9.</u></p> <p><u>2.106.001.12.2 Representation</u></p> <p><u>a. ASHRAE shall appoint a representative and an alternate representative to IEQ-GA to serve terms of up to three years.</u></p> <p><u>b. The representative and alternate representative shall be recommended by the Environmental Health Committee and confirmed by Presidential appointment when renewal of representatives is required.</u></p> <p><u>c. ASHRAE shall fund travel costs for its representative to attend one in-person meeting of IEQGA per year.</u></p>

	<p><u>2.106.001.12.3 Oversight</u></p> <p><u>Responsibility for monitoring of IEQ-GA shall be assigned to Environmental Health Committee.</u></p>
6 - 8	<p>Technology Council recommends that the Board of Directors approve a revision to the <i>Filtration and Air Cleaning</i> position. (ATTACHMENT B)</p>
7 - 8	<p>The Society Rules Committee recommends to the Board of Directors that the below changes to ROB Section 3.300.006 Conflict of Interest be approved as presented:</p> <p><b>3.300.006 CONFLICT OF INTEREST</b> (24-01-21-08/94-01-26-28/01-01-31-32A/09-06-24-16)</p> <p>In appointing and electing members to <u>ASHRAE standing bodies the Board of Directors, standing committees and councils of the Society</u>, the Nominating Committee, the President, <u>and</u> the Board of Directors <u>and any subcommittees that nominate for Society positions</u> shall make every reasonable effort to avoid <u>any and all</u> situations in which there could exist <u>the appearance or implication of a conflict</u> of interest, <u>including but not limited to</u>, the gain of proprietary advantage. Slates of nominees shall strive for a balance of all interests (such as employer, ASHRAE region, industry, and technology). ROB 1.140.002, ASHRAE’s Conflict of Interest Policy, applies to all <u>such</u> nominations and appointments.</p>
8 - 8	<p>The Society Rules Committee recommends to the Board of Directors that the below changes to ROB 3.300.005 Appointments sections B.4 and B.5, be revised as shown below:</p> <p><b>3.300.005 APPOINTMENTS</b></p> <p>3.300.005.B.4:</p> <p>The Director and Regional Chair and the respective outgoing Regional Vice Chair shall recommend their selected candidate to the Society President-Elect for appointment for a term of one year. <del>No individual should serve consecutive full 3-year terms. No individual shall serve in any one position for more than three years.</del></p> <p>3.300.005.B.5:</p> <p>If a member appointed is unable to serve or complete a term, the Director and Regional Chair and the respective preceding Regional Vice Chair shall confer and select a replacement candidate to recommend to the Society President for appointment. <u>The replacement candidate should complete the current term of the member that is being replaced.</u></p>



## MINUTES

### BOARD OF DIRECTORS MEETING

Wednesday, June 26, 2024

#### MEMBERS PRESENT:

Dennis Knight, President  
Bill McQuade, President-Elect  
Sarah Maston, Treasurer  
Devin Abellon, Vice President  
Wade Conlan, Vice President  
Ken Fulk, Vice President  
Chandra Sekhar, Vice President  
Jeff Littleton, Secretary  
Charles Bertuch, Region I DRC  
Genevieve Lussier, Region II DRC  
Sherry Abbott-Adkins, Region III DRC  
Bryan Holcomb, Region IV DRC  
Jim Arnold, Region V DRC  
Susanna Hanson, Region VI DRC  
Scott Peach, Region VII DRC  
Joe Sanders, Region VIII DRC

Jonathan Smith, Region IX DRC  
Buzz Wright, Region X DRC  
Rob Craddock, Region XI DRC  
John Constantine, Region XII DRC  
Cheng Wee Leong, Region XIII DRC  
Mahroo Eftekhari, Region XIV DRC  
Richie Mittal, Region XV DRC  
Bassel Anbari, RAL DRC  
Carrie Brown, DAL  
Doug Cochrane, DAL  
Blake Ellis, DAL  
Luke Leung, DAL  
Patrick Marks, DAL  
Corey Metzger, DAL  
Heather Schopplein, DAL  
Wei Sun, DAL  
David Yashar, DAL

#### GUESTS PRESENT:

Usman Abdulrahman  
Matthew Archey  
Gunther Berthold  
Fernando Dutra del Castillo  
Jim Earley  
Patrick Ryan  
Anna Sanzere

Mohammed Murtaza  
Vineet Nair  
Michael Patton  
Tom Pollard  
Robert Romeo  
Steve Rosenstock  
David Scearce  
Katlyn Stoker

Melvin Garrett  
Jennifer Guerrero-Ferreira  
Eileen Jensen  
Maggie Moninski  
Corey Weiss

#### STAFF PRESENT:

Candace Denton, Sr. Manager - Board Services  
Chandrias Jolly, Manager - Board Services  
Vanita Gupta, Director – Marketing  
Lizzy Seymour – Director – Member Services  
Mark Owen, Director - Publications & Education  
Kirstin Pilot, Director - Development  
Stephanie Reiniche, Director - Technology

Alice Yates, Director - Government Affairs  
Craig Wright, Director of Finance

**CALL TO ORDER**

The meeting was called to order at 2:00 pm.

Ms. Scoggins asked if there was any further business to come before the assembly. There was none. Ms. Scoggins declared the 2023-24 Annual Meeting adjourned.

Mr. Knight called the first meeting of the 2024-25 Board of Directors to order. He welcomed everyone to the first BOD meeting and extended a special welcome to newly elected BOD members

**VALUE STATEMENT**

Mr. Knight read the value statement and advised that the full code of ethics, core values and diversity statements were available online.

**ROLL CALL/INTRODUCTIONS**

Roll call was conducted. Guests and staff introduced themselves. Members, guests, and staff were in attendance as noted above.

**REVIEW OF MEETING AGENDA**

Mr. Knight reviewed the meeting agenda. There were no changes or additions.

**OPEN SESSION – ADDRESSES TO THE BOARD OF DIRECTORS**

The floor was opened for addresses to the BOD.

Mr. Knight read the following comment that was submitted online:

**Money Khanna, Chandigarh Chapter** – *It was great to attend this meeting physically after a long time. It is just a quick suggestion to the Board to open more avenues to involve more people and get accessible to attend all meetings other than ASHRAE leadership committee meetings. Involvement, accessibility, outreach, education, and awareness is the key to success in the Society. Keep growing ASHRAE!*

The following members addressed the BOD:

**Corey Royce, Detroit Chapter** – *Following up at the recommendation of Trent Hunt regarding a letter that a TC sent to the SPC regarding the future strategic plan. Mr. Hunt suggested that we come and speak to you to reiterate our commitment to the Society to assist in the decarbonization initiative as part of net zero goals. The TC wrote the letter because the group wasn't feeling very included, and we believe that we have a very important role to play and can be of great assistance to Society. Combustion is not viewed favorably, with the use of renewable fuels, hydrogen being a prominent one can help in this transition. Look forward to being included and engaging with Society in this quest.*

**Jennifer Guerrero-Ferreira, Atlanta Chapter** – *Feel that the TC has a very important role to play and there are different ways to get to that end goal. One size doesn't always fit all, and fuels still have an important role to play. Also suggest looking at alternative energies and alternative fuels.*

*Ask that the cognizant TCs be informed, involved, and have a seat at the table when these topics are discussed.*

**David Searce, Lehigh Valley Chapter** – *Want to reiterate what my colleagues have said. The strategic plan needs to include fuels and combustion and the TCs are dedicated to helping the Society achieve its goals.*

**Gunther Gottfried Berthold, Italy Section** – *Would like to provide more support from a European point of view. ASHRAE has a broad influence worldwide. Europe is showing that a multi-energy and multi-technology approach can solve the problems of decarbonization. Fuels are also decarbonized and are an important part of decarbonization. Suggest that fuels should be expressly included in the strategic plan.*

Mr. Knight thanked members for their comments and for the reminder that there is more than one way to skin the cat.

Mr. Abellon also expressed his thanks. He advised that the Planning Committee continues to seek feedback at all levels. He stated that the group was discussing this topic along with comments from other parties. He stated that as the plan continues to be developed, the Planning Committee will continue to engage with members.

#### **REPORT OF THE 2024 ANNUAL MEETING**

#### **REPORT ON SPRING 2024 MEMBER BALLOT**

Mr. Littleton reported that the outcome of the spring 2024 member ballot was attached to the agenda as a permanent record. He reported that the results were also announced at the President's Lunch.

#### **INDIANAPOLIS ANNUAL MEETING RECAP**

Mr. Littleton asked each of the staff directors to provide an update on their respective departments. A summary of those updates is below:

**Lizzy Seymour, Member Services** – *There were a total of 2,040 registrants for the Indianapolis Annual Meeting. Of those, 1,312 were in-person, 520 were committee meeting only, and 128 were virtual. Registrations for this conference were just 1% lower than the 2023 conference in Tampa and 10% higher than the 2022 conference in Toronto.*

*The most popular technical session was Seminar 19: Farewell VRP: Paving the Way for Indoor Air in the Future of Ventilation and Air Quality, with 111 attendees.*

*The CIDCO conference was co-located with the Annual Conference and the most popular CIDCO session was Seminar 1: AI and Building Performance: An Overview and Practical Application, with 125 attendees.*

*The most popular livestreamed session was Panel 5: Specifying, Procuring and Meeting Embodied Carbon MEP Requirements, with 89 virtual attendees.*

*There were a total of 17 livestreamed technical sessions, 1 virtual session, 91 in-person technical sessions, and 20 CIDCO sessions.*



*There was a total of 396 meetings held at the conference.*

*This conference had a record amount of sponsorship, with a total of \$111,100. This total represents sponsorships for the Annual Conference and the CIDCO conference.*

*There was a total of 89% hotel pickup at both hotels.*

**Mark Owen, Publications and Education** – *Total sales from the conference bookstore was \$24,956, which is \$2,317 higher than the 2023 conference in Tampa. Top sellers at the bookstore were logo items, the \$6 Conference Papers, Lucy's children's books, 2024 Handbook – HVAC Systems and Equipment, Standard 241, and Standard 62.1. Average bookstore sales revenue for the last 10 Annual Conferences is about \$52,000.*

*The total number of AII course registrations was 124, which was 13 more than the 2023 conference in Tampa and 48 more than the 2022 conference in Toronto. The revenue total of \$24,840 was \$8,480 more than the 2023 conference in Tampa and \$5,977 more than the 2022 conference in Toronto. The average for the last 10 Annual Conferences is 165 attendees and about \$32,400 revenue. The top course for registrants was a three-hour course, V in HVAC – Health and Energy Improvements Using the Indoor Air Quality Procedures.*

*The combined total revenue for AII courses and bookstore for this conference was \$49,436.*

## **CONSENT MOTIONS**

Mr. Constantinide moved and Mr. McQuade seconded that

1. The following be approved as a consent motion:

A. That Fiducient Advisors LLC be approved as ASHRAE investment advisor for fiscal year 2024-2025.

B. That Jones and Kolb be approved as ASHRAE Certified Public Accountants for fiscal year 2024-2025.

C. That the appropriate and required bank resolutions for institutions in which ASHRAE funds are deposited as executed by officers for fiscal year 2024-2025 be approved.

D. That King & Spalding LLP and Holland & Knight LLP be retained as ASHRAE legal counsel for fiscal year 2024-2025.

**MOTION 1 PASSED** (Unanimous Voice Vote, CNV).

## **COUNCIL REPORTS**

### **MEMBERS COUNCIL**

Mr. McQuade reported on behalf of the council. The full report was attached to the agenda.

Mr. McQuade moved that

2. Members Council recommends to the Board of Directors that the revision to the ROB as shown below be approved.

## 2.402 GOVERNMENT AFFAIRS COMMITTEE

### 2.402.002.1 Composition

The members of this committee are as follows:

A. Voting members, including a Chair and one Vice chair, a Communications Coordinator, one representative from each Region who serves as Regional Vice Chair, one representative from each Council (Technology Council, Members Council, Publishing and Education Council) and four (4) at-large members.

...

### 2.402.002.3 Term of Service

The term of service for The Chair, ~~the~~ and Vice Chairs, ~~and Council Representatives~~ shall be one year. The term of service for the other voting members shall be three years, subject to ROB 3.300 *Election and Appointment Procedures*.

Mr. McQuade provided background on the motion. He read from the report and it was shown on screen.

**MOTION 2 PASSED** (Unanimous Voice vote, CNV).

Mr. McQuade reviewed information items from the report. He reported that the newly approved Nordic Chapter, sponsored by Region XIV, marks Society's 200<sup>th</sup> Chapter.

Members Council also approved the charter of 16 new student branches.

## PUBLISHING AND EDUCATION COUNCIL

Mr. Sekhar reported on behalf of the council. The full report was attached to the agenda. A revised report is included in ATTACHMENT A.

Mr. Sekhar moved that

3. PEC recommends the BOD approve changes to the Publication's Committee section of the ASHRAE Rule of the Board (ROB) as shown below:

### 2.419.003.1

...

- B. ASHRAE shall produce Special Publications that shall be defined as all technical publications in print format (except for the ASHRAE Handbook series; standards, guidelines, and user's manuals; ASHRAE's research journal, and ASHRAE's magazines), such as ~~non-series~~ books (including books resulting from ASHRAE Research Projects and Special Projects), ~~books in the Advanced Energy Design Guide series and the ASHRAE Datacom Series~~, charts, and tools, as well as all technical publications in machine-readable format, such as audio and visual presentations, software, databases, apps, and online resources. These special publications may be generated from proposals submitted directly to Publications Committee or from accepted Publication Topic

Acceptance Requests (PTARs), which Publications Committee reviews before providing recommendations to Research Administration Committee (RAC) for the final vote regarding funding. This committee shall also communicate with the cognizant TCs of existing ASHRAE publications to help staff determine whether older publications are up to date as is, need to be revised, or need to be removed from sale.

...

- D. The objective of *ASHRAE Journal* shall be to lead in communication of heating, ventilating, air-conditioning and refrigeration information to and from the profession, industry, and related interests. (ROB 520-144-007). Editorial and advertising content of *ASHRAE Journal* shall be directed toward the professional education of persons engaged in industries related to heating, ventilating, air conditioning, and refrigeration. (86-06-22-18L). This committee shall determine the annual winner of the Journal Paper Award.

Mr. Sekhar reported that the proposed changes were clean up and minor editorial changes.

**MOTION 3 PASSED** (Unanimous Voice Vote, CNV).

Mr. Sekhar moved that

4. To create a unified learning platform to support ASHRAE eLearning, instructor-led training, and self-directed learning offerings and enhance the user experience for ASHRAE members and the wider public, funded by the General Reserve Fund.

Mr. Sekhar read background on the motion. The full background is included in ATTACHMENT A and was shown on the screen.

He reported that fiscal impact would be a one-time cost of \$109,000 to build the new unified learning website. If approved, the cost would be funded from general reserves.

It was asked what the timeframe was to have the website completed. Mr. Owen reported that it would be less than one year.

It was asked if the intent was for the \$40,000 annual expense to come out of the 2024-25 budget and then annually moving forward. Mr. Owen reported that the \$40,000 annual expense would be included in the 2024-25 Society budget.

Mr. Ellis stated that the proposal would reduce staff time and should increase sales. He reported that feedback from the roundtables was that training was cumbersome and not user friendly.

Mr. Peach spoke in favor of the motion. He stated that the proposed platform represented the type of changes Society should make to adapt. He expressed that he was fearful of approving the motion and getting a product that doesn't measure up to expectations.

Mr. Constantinide spoke in favor of the motion. He stated that Society has substantial funds in the general reserve. He expressed his opinion that the proposal was an investment in members, streamlining staff time, and digitizing ASHRAE resources.

Ms. Maston stated that the proposed motion would support President Knight's initiatives. She stated that Society offers top quality training and education right now, but it is often difficult to find what someone is looking for. She advised that Training and Education will also be engaged.

Mr. Sekhar spoke in favor of the motion. He stated that the proposed motion was in line with the new strategic plan initiatives, accessibility specifically.

**MOTION 4 PASSED** (Unanimous Vote, CNV).

Mr. Sekhar reviewed information items from the report. He reported that there were a record 700 applications for the certification program.

### **TECHNOLOGY COUNCIL**

Mr. Conlan reported on behalf of the council. The full report was attached to the agenda.

Mr. Conlan moved that

5. Technology Council recommends to the Board of Directors that the Rule of the Board be revised and a new section be added as follows:

[2.106.001.12 Indoor Environmental Quality Global Alliance \(IEQ-GA\)](#)

[2.106.001.12.1 Membership](#)

[a. ASHRAE is a founding Full Member of the Indoor Environmental Quality Global Alliance \(IEQGA\) a consortium of organizations incorporated in Belgium and shall pay annual dues to maintain its continuing membership.](#)

[b. Membership is subject to review every five years, to be completed in each calendar year ending in either 4 or 9.](#)

[2.106.001.12.2 Representation](#)

[a. ASHRAE shall appoint a representative and an alternate representative to IEQ-GA to serve terms of up to three years.](#)

[b. The representative and alternate representative shall be recommended by the Environmental Health Committee and confirmed by Presidential appointment when renewal of representatives is required.](#)

[c. ASHRAE shall fund travel costs for its representative to attend one in-person meeting of IEQGA per year.](#)

[2.106.001.12.3 Oversight](#)

[Responsibility for monitoring of IEQ-GA shall be assigned to Environmental Health Committee.](#)

Mr. Conlan provided background on the motion. The full background was included in the report and was shown on screen.

He reported that the proposed rules change was to document what was previously approved related to IEQ-GA and EHC oversight.

**MOTION 5 PASSED** (Unanimous Voice Vote, CNV).

Mr. Conlan moved that

6. Technology Council recommends that the Board of Directors approve a revision to the *Filtration and Air Cleaning* position. (ATTACHMENT B)

**MOTION 6 PASSED** (Unanimous Voice Vote, CNV).

Mr. Conlan reviewed information items from the report.

Mr. Knight stated that the report from the ETF contains a wealth of knowledge. He expressed his thanks to Tech Council and the ETF for their great work.

### **COMMITTEE AND AD HOC REPORTS**

#### **SOCIETY RULES COMMITTEE**

Mr. Sekhar reported on behalf of the committee. The full report was attached to the agenda.

Mr. Sekhar moved that

7. The Society Rules Committee recommends to the Board of Directors that the below changes to ROB Section 3.300.006 Conflict of Interest be approved as presented:

#### **3.300.006 CONFLICT OF INTEREST (24-01-21-08/94-01-26-28/01-01-31-32A/09-06-24-16)**

In appointing and electing members to ~~ASHRAE standing bodies the Board of Directors, standing committees and councils of the Society~~, the Nominating Committee, the President, and the Board of Directors ~~and any subcommittees that nominate for Society positions~~ shall make every reasonable effort to avoid ~~any and all~~ situations in which there could exist the appearance or implication of a conflict of interest, including but not limited to, the gain of proprietary advantage. Slates of nominees shall strive for a balance of all interests (such as employer, ASHRAE region, industry, and technology). ROB 1.140.002, ASHRAE's Conflict of Interest Policy, applies to all ~~such~~ nominations and appointments.

Mr. Sekhar reviewed the background on the motion. The full background was included in the report and was shown on screen. He reported that the main discussion point was about the appearance of a conflict of interest. He reported that SRC discussed the wording of this proposed change at length.

**MOTION 7 PASSED** (Unanimous Voice Vote, CNV).

Mr. Sekhar moved that

8. The Society Rules Committee recommends to the Board of Directors that the below changes to ROB 3.300.005 Appointments sections B.4 and B.5, be revised as shown below:

#### **3.300.005 APPOINTMENTS**

3.300.005.B.4:

The Director and Regional Chair and the respective outgoing Regional Vice Chair shall recommend their selected candidate to the Society President-Elect for appointment for a term

of one year. ~~No individual should serve consecutive full 3-year terms. No individual shall serve in any one position for more than three years.~~

3.300.005.B.5:

If a member appointed is unable to serve or complete a term, the Director and Regional Chair and the respective preceding Regional Vice Chair shall confer and select a replacement candidate to recommend to the Society President for appointment. The replacement candidate should complete the current term of the member that is being replaced.

Mr. Sekhar reviewed the background on the motion. The full background was included in the report and was shown on screen. He reported that the proposed changes put into writing a practice that is already being done.

**MOTION 8 PASSED** (Unanimous Voice Vote, CNV).

Mr. Sekhar reviewed information items from the report.

#### **FINANCE COMMITTEE**

Ms. Maston reported on behalf of the committee. The full report was attached to the agenda.

She reported that there were no recommendations for the BOD's consideration. She reviewed information items from the report.

She reported that the Foundation approved funding for \$140,000 worth of programs. The BOD applauded the Foundation's tremendous support of Society.

She reported that the Scholarship Trustees approved four high school scholarships and one additional freshman scholarship.

#### **ASHRAE MEMBERSHIP MODEL AD HOC**

Mr. Fulk reported on behalf of the ad hoc. The full report was attached to the agenda.

He reported that there were no recommendations for the BOD's consideration. He reported that the ad hoc conducted many activities to prepare to engage with the mission and develop a sustainable membership model.

He reviewed information items from the report.

He reported that there was lively discussion at this meeting and a lot of good ideas were brought forward. He expressed that the ad hoc was on a good path to present the BOD with recommendations.

The ad hoc is reviewing referred motions as well as the development of the proposed 'ASHRAE Yellow Pages.'

He thanked staff for their hard work and great support.

Mr. Knight thanked Mr. Fulk and the ad hoc for their work. He stated that the group had eagerly taken up the torch and was engaged in important work. He stated that he looked forward to receiving the group's future recommendations.

### **2024-25 GOALS**

Mr. Knight reported that new ad hocs had not been assigned for the new Society Year. He expressed that he was looking forward to working with the BOD this Society Year.

He stated that whether the BOD meets in person or virtually, the very best service the BOD can give Society is to remember our core values and show up with our full selves when attending BOD meetings. He implored BOD members to do their homework and review agendas thoroughly. Doing so, would allow the BOD to make better decisions for the members and Society. Behind every report, every request for consideration, there are volunteers and staff that are just as passionate about their work as the BOD is.

Let's get started!

Mr. Anbari asked what next steps were regarding comments made during open session. Mr. Knight advised that Mr. Abellon acknowledged the comments, and the Planning Committee took the comments seriously. Planning will continue to engage with the TC as they are Society's subject matter experts.

Mr. Knight stated that a primary goal for the Society Year is to develop a strategic plan that has meaning and purpose and have it concluded and approved by the 2025 Annual Conference. He stated that the strategic plan should be a primary focus and remain front and center throughout the Society Year.

### **2024-25 MENTORS**

Mentor assignments for the 2024-25 Society Year were shown on screen and are listed below:

<b>First-Year Director</b>	<b>Mentor</b>
Charles Bertuch (DRC – I)	Buzz Wright (DRC – X)
Genevieve Lussier (DRC – II)	Joe Sanders (DRC – VIII)
Sherry Abbott-Adkins (DRC – III)	Susanna Hanson (DRC – VI)
Rob Craddock (DRC – XI)	Doug Cochrane (DAL – II)
Bassel Anbari (DRC – RAL)	Mahroo Eftekhari (DRC – XIV)
Carrie Brown (DAL – X)	Heather Schopplein (DAL – X)
Patrick Marks (DAL – III)	Corey Metzger (DAL – VI)
David Yashar (DAL – III)	Luke Leung (DAL – VI)

**INFORMATION ITEMS**

Appointments and elections for the 2024-25 Society Year were attached to the agenda for the BOD's review.

A tentative CRC schedule for the 2024-25 Society Year was attached to the agenda. It was reported that an updated schedule, with staff assignments, would be distributed to the BOD when available.

BOD members were asked to complete a conflict-of-interest form and submit it to staff by July 1<sup>st</sup>.

**ADJOURNMENT**

The meeting adjourned at 3:08 pm.



Jeff H. Littleton, Secretary

**ATTACHMENTS:**

- A. Publishing and Education Council Report (Revised)
- B. Proposed Changes to *Filtration and Air Cleaning* PD



**REPORT TO THE BOARD OF DIRECTORS**  
**From the Publishing and Education Council (PEC)**  
**As of June 26, 2024**

**Recommendations for Board Approval:**

1. **Motion:** PEC recommends the BOD approve changes to the Publications Committee's section of the ASHRAE Rules of the Board (ROB) as shown below:

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**2.419 PUBLICATIONS COMMITTEE**

**2.419.001 SCOPE AND PURPOSE**

This committee identifies the technical information needs of the HVAC&R industry not met through the ASHRAE Handbook series, ASHRAE's research journal, standards, guidelines, or user's manuals and oversees editorial policies and delivery of products to the marketplace. This committee also determines the best paper published in the volume year of *ASHRAE Journal* preceding the ASHRAE Winter Conference.

**2.419.002 MEMBERSHIP**

**2.419.002.1 Composition**

The members of this committee are as follows:

- A. Twelve (12) voting members, including a chair and a vice chair. (16-06-29-20)
- B. Non-voting members include a Board ex officio member and coordinating officer.

**2.419.002.2 Qualifications**

- A. All members of the committee shall hold the grade of Associate Member or higher in the Society.
- B. Members should have an awareness of the current technical information needs of various segments of the HVAC&R industry.
- C. Membership should include broad representation from the HVAC&R industry including the academic, design, construction, facility operations and manufacturing communities.
- D. At least three members should have recent experience with the production or writing of technical publications or periodicals.

**2.419.002.3 Term of Service**

The term of service for voting members is intended to be three (3) years.

**2.419.003 OPERATION**

**2.419.003.1 General Requirements**

- A. This committee shall oversee the editorial policies of ASHRAE's Special Publications, *ASHRAE Transactions* and other conference proceedings, *ASHRAE Journal*, and ASHRAE's electronic newsletters. The committee shall be subject to these conditions:

1. The data recommended for publication shall tend toward the professional education of the individual engineer;
  2. Such data shall be free from commercial bias;
  3. Such data shall tend to advance for the public benefit the arts and sciences relating to heating, refrigeration, air conditioning, and ventilation and the allied arts and sciences.
- (67-06-25-08/82-06-30-25/86-06-22-18M)

B. ASHRAE shall produce Special Publications that shall be defined as all technical publications in print format (except for the ASHRAE Handbook series; standards, guidelines, and user’s manuals; ASHRAE’s research journal, and ASHRAE’s magazines), such as ~~non-series~~ books (including books resulting from ASHRAE Research Projects and Special Projects), ~~books in the Advanced Energy Design Guide series and the ASHRAE Datacom Series~~, charts, and tools, as well as all technical publications in machine-readable format, such as audio and visual presentations, software, databases, apps, and online resources. These special publications may be generated from proposals submitted directly to Publications Committee or from accepted Publication Topic Acceptance Requests (PTARs), which Publications Committee reviews before providing recommendations to Research Administration Committee (RAC) for the final vote regarding funding. [This committee shall also communicate with the cognizant TCs of existing ASHRAE publications to help staff determine whether older publications are up to date as is, need to be revised, or need to be removed from sale.](#)

C. The objective of *ASHRAE Transactions* shall be to serve as the archival publication of unsolicited research papers and Society-sponsored research and discussions in HVAC&R technical areas presented at the ASHRAE Annual and Winter Conferences as well as of Society business such as council and committee membership and award recognition. The objective of proceedings of ASHRAE-sponsored conferences and ASHRAE cosponsored conferences shall be to serve as the archival publications of the unsolicited research papers presented at these conferences.

D. The objective of *ASHRAE Journal* shall be to lead in communication of heating, ventilating, air-conditioning and refrigeration information to and from the profession, industry, and related interests. (ROB 520-144-007). Editorial and advertising content of *ASHRAE Journal* shall be directed toward the professional education of persons engaged in industries related to heating, ventilating, air conditioning, and refrigeration. (86-06-22-18L). [This committee shall determine the annual winner of the Journal Paper Award.](#)

E. The objective of ASHRAE’s electronic newsletters shall be to communicate news to various audiences. *Insights*, distributed to members only, includes news of members, chapters, regions, Society committees, and International Associates. (ROB 520-144-007; 86-06-22-18L) *ASHRAE Journal Newsletter*, distributed to members only, connects news of industry trends with articles from *ASHRAE Journal*’s archive of peer-reviewed content. *ASHRAE HVAC&R Industry News* curates the latest trends and announcements from the industry to a large readership of members and non-members. *HPB Newsletter* combines online HPB articles and *ASHRAE Journal* articles with links to external articles related to energy efficiency, resiliency and sustainability for a diverse audience of ASHRAE engineers, architects, facilities managers and building owners.

**2.419.004 STRATEGIC PLAN** (09-06-21-12C)

This committee shall develop procedures for recommending updates to the strategic plan on a continuous basis. As a minimum the committee shall submit a report to the council prior to the Annual Meeting. The report includes the current status of each activity which supports the fulfillment of the committee’s assignments under the strategic plan. The committee shall report to the council all recommendations for changes to the strategic plan as provided by the committee’s constituents prior to the Annual Meeting.

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**Background:** These changes reflect the need to include mention of the annual Journal Paper Award and to include another missing member task (communicating with the TC leadership), as well as a minor editorial change to the listing of Special Publications.

**Fiscal Impact:** None.

**Staff Impact:** No changes.

*(PEC Planning Subcommittee approved unanimously, 9-0-0, CNV; PEC approved unanimously, 12-0-0, CNV)*

2. **Motion: To create a unified learning platform to support ASHRAE eLearning, instructor-led training, and self-directed learning offerings and enhance the user experience for ASHRAE members and the wider public, funded by the General Reserve Fund.**

**Background:** Currently, ASHRAE offers a rich array of educational resources across these three distinct categories. While the quality of content and instructor expertise are widely recognized, the committee believes there is room for improvement in the accessibility and user-friendliness of the training offerings.

The existing system requires individuals interested in ASHRAE training to navigate multiple webpages, each dedicated to a specific training type. Furthermore, these trainings must be purchased separately based on their respective learning categories. This fragmented approach presents several challenges:

1. **Inefficiency:** Members and the public must spend unnecessary time navigating different pages to find the training they need.
2. **Complexity:** The current structure can be confusing, leading to missed opportunities for skill development for users and missed purchases for ASHRAE.
3. **Frustration:** Potential learners may be discouraged by the complexity of the process, resulting in lost opportunities for both ASHRAE and individuals seeking professional development. Feedback from the CRCs roundtable is that guidance is needed in how to navigate through ASHRAE's technical resources and educational offerings.

To address these issues and provide a more user-centric learning experience, the Training and Education Committee (TEC) proposes the creation of a unified ASHRAE learning platform. The platform would consolidate ASHRAE eLearning, instructor-led training, and self-directed learning into a single, user-friendly web-based platform. The new platform will replace the existing website pages members currently use to find and purchase the various types of training.

Key features and benefits of the proposed ASHRAE learning platform:

1. **Centralized Access:** Users can access all types of ASHRAE training from a single location, streamlining the process of finding relevant courses.
2. **Seamless Registration and Purchase:** Individuals can conveniently register for and purchase different types of training from a single source/provider, reducing administrative burdens and simplifying payments.
3. **Personalized Learning Paths:** The platform will allow users to create personalized learning paths, tracking their progress and recommending additional courses based on their interests and needs. ASHRAE can also provide learning paths for each of the ASHRAE Certifications, potentially increasing the use of learning courses and the applications for certifications.
4. **Enhanced Search and Filter Functions:** Robust search and filter options will make it easier for users to find the precise training they want. This includes being able to filter and search for learning materials that correspond to an ASHRAE Certification.
5. **Feedback and Assessment:** Interactive features will enable users to provide feedback and evaluate the quality of courses, contributing to ongoing improvement.
6. **Community and Collaboration:** The platform will also foster a sense of community and facilitate collaboration among ASHRAE members and learners.

The new single platform for training will allow ASHRAE to promote several types of training in a single location and encourage members and nonmembers to obtain the content in a format that matters to them. Increased use/purchase of courses and training may also encourage new courses and instructors, increasing the already rich ASHRAE training portfolio.

TEC believes that the creation of this unified ASHRAE learning platform aligns with ASHRAE's mission to advance the arts and sciences of heating, ventilation, air conditioning, and refrigeration. Making ASHRAE educational resources more accessible and user-friendly will empower industry professionals and enthusiasts to effectively achieve their learning goals.

TEC kindly requests your approval and support to make this vision a reality, benefiting ASHRAE members and the broader HVAC&R community.

Thank you for considering this proposal. We look forward to discussing this initiative further and working together to improve ASHRAE's training offerings.

**Fiscal Impact:** The cost to implement the project is a one-time cost of \$109,000 to build out the new unified learning website. There is projected annual increase of \$40,000 for the hosting platform starting in year two. By streamlining and consolidating the hosting and check out process there is an expected increase in revenue and sales. Implementation would also result in a reduction in demands on ASHRAE staff.

#### **Expected Benefits**

- An increase is expected in revenue from a streamlined offering that simplifies the navigation of offerings and the checkout process. Any specific numbers are conjecture but we do believe that the increased revenue will more than offset the increased cost.
- Currently collection of data on sales and users is difficult to correlate and use. A unified platform would allow for better data collection and more targeted marketing to drive additional sales.
- A considerable amount of staff time will be saved through automation on the new platform. The estimated savings are \$20,000 annually in staff time after implementation and an additional 500 hours per year available for staff to spend on other priorities and projects that are currently not getting the attention they deserve.

*(PEC Professional Development Subcommittee approved unanimously, 9-0-0, CV; PEC Fiscal Subcommittee approved unanimously, 9-0-0, CV; PEC approved unanimously 12-0-0, CNV)*

#### **Information Items:**

1. ASHRAE Certification received a record **700+** applications in 2023-24, which is a **45% increase** over the 2022-23 near record total of 482 applications.
2. ASHRAE Certification received over 100 applications for **Decarbonization Professional Certification** the since March 1, 2024. The first Certified Decarbonization Professional ([CDP](#)) certification exams will be administered June 25, 2024.

3. ASHRAE Certification reports that through May 31, 2024, **over 1,100 study guides** have either been sold or selected as a renewing full Member benefit.

- [Certification Study Guide: Certified HVAC Designer \(CHD\)](#)
- [Certification Study Guide: Building Commissioning Professional \(BCxP\)](#)
- [Certification Study Guide: Building Energy Modeling Professional \(BEMP\)](#)

June 25, 2024

Billy Austin

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Date

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Chair

## ASHRAE Position Document on Filtration and Air Cleaning

Approved by the ASHRAE Board of Directors [DATE]

Expires [DATE]

ASHRAE is a global professional society of over 55,000 members committed to serving humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields (HVAC&R). The Board of Directors approves ASHRAE position documents which express the views of the Society on specific issues. These documents provide objective, authoritative background information to persons interested in issues within ASHRAE's expertise, particularly in areas where such information will help draft sound public policy. The documents also clarify ASHRAE's position for its members and building professionals. The present document is not a regulatory code or standard. It is an advisory guideline, notably when regulatory documents are missing or inadequate.

### Filtration and Air Cleaning is a Public Interest Issue

Airborne contaminants, i.e., gases, vapors, and particles (including bioaerosols, i.e., bacteria, molds, fungi, and viruses), can originate from indoor sources, such as building materials, common cleaning agents and occupant activities, or the outdoor environment. Outdoor contaminants, such as pollen or combustion products, occur naturally in plant life and vegetation, while human activities generate pollutants, such as exhaust from factories and the internal combustion engines of motor vehicles. Combustion processes create by-products such as nitrous oxide (NO<sub>2</sub>) and ultrafine particles. These airborne contaminants can seriously impact human health and well-being. Filtration and air cleaning can improve indoor air quality by physically removing airborne contaminants, inactivating viable biological particles, or transforming gaseous contaminants through chemical reactions.

The effectiveness of various filtration and air cleaning technologies, both in-duct and in-room, depends on the nature of airborne contaminants, the airflow rates and patterns in the space induced by the HVAC layout and air cleaners, the operation principles of the filtration and air cleaning technology, and their proper application. Experimental data in the peer-reviewed literature show that some air-cleaning and filtration technologies can effectively remove or inactivate airborne contaminants. However, there is considerable variation in the research documenting the direct effects of various filtration and air-cleaning devices on human health regarding both short-term and long-term effects, generally suggesting insufficient research to make firm conclusions. Further, filtration and air cleaning can have positive and negative secondary consequences, including changing energy use, impacting work performance, learning and absenteeism, emitting by-products of air cleaning, and changing building occupants' perceptions of the indoor environment. Similar to health impacts, there is generally limited evidence on some of these consequences to make firm conclusions.

Filtration and air cleaning offer a cost-effective, energy-efficient alternative or supplement to other exposure reduction methods, such as pollutant source control or dilution by ventilation with outdoor air or use of the local exhaust. As a result of the use of filtration and air cleaning, the effect of ventilation with outdoor air can be enhanced thanks to the improved quality of the supplied air and/or increased air volume used for diluting the contaminants. This benefit is particularly relevant in many urban places not fulfilling ambient air quality standards and recommendations specified by the World Health Organization or the US Environmental Protection Agency.

Filtration and air cleaning technologies can help reduce the energy used for and the carbon impact of particularly air conditioning, especially when outdoor air is hot and humid. Hence, they offer the opportunity to lower operational costs thanks to energy savings because less outside air needs to be conditioned without compromising indoor air quality. Examples of such applications are the Indoor Air Quality Procedure (IAQP) design method in ASHRAE Standard 62.1 for commercial buildings or the adoption of air filtration according to ASHRAE Standard 62.2 for residential buildings.

The HVAC industry, the government, and the public should be informed about the potential benefits and challenges of filtration and air-cleaning technologies. Limitations related to specific applications, long-term performance, and potential operational risks should be considered, along with the benefits. The purpose of the present Position Document is to provide a basis for a comprehensive consideration of filtration and air cleaning.

## Why ASHRAE Takes Positions on Filtration and Air Cleaning

ASHRAE is committed to addressing the impact of HVAC-related technologies on human exposure to airborne contaminants. As part of its core mission, ASHRAE actively sets guidelines

and standards to evaluate the effectiveness of HVAC technologies, including filtration, air cleaning, and disinfection, to reduce exposure to contaminants and safeguard the health and comfort of building occupants. This evaluation is crucial in guiding ASHRAE members and the public in selecting and using filtration and air-cleaning technologies. Additionally, the evaluation is necessary as these technologies are included in standards prepared by ASHRAE, such as ASHRAE Standard 61.1, 62.2, and 170.

The indoor air quality procedure outlined in ASHRAE Standard 62.1 (Ventilation for Acceptable Indoor Air Quality) determines the amount of outdoor air appropriate for indoor space(s). When applied correctly, this procedure allows the deployment of filtration and air cleaning technologies and other strategies to enhance indoor air quality, lower outdoor air requirements, and reduce energy consumption by air-handling systems. The indoor air quality procedure requires the deployed filtration and air cleaning technologies to undergo efficiency assessments using recognized standard test methods (e.g., ASHRAE Standards 52.2 and 145.2, among others). Emerging standard test methods allow for determining the efficiency of filtration and air cleaning technologies applied in a chamber, duct, or combination thereof. In addition, ASHRAE Standard 241 introduced comprehensive requirements for infection risk management, which are outlined in terms of equivalent clean airflow rate per occupant in a given space use type (ECAi). This approach expands the traditional scope of ventilation strategies beyond simply increasing outdoor air intake. It acknowledges the potential of filtering, cleaning, and disinfecting the air by various technologies to contribute to meeting the equivalent clean airflow requirements. This flexibility allows for compliance through customized control combinations, optimizing costs and energy usage.

## History and Terminology

ASHRAE's Board of Directors approved the first version of the Position Document on Filtration and Air Cleaning in 2015. The present document is a revised version with updated positions and recommendations. It uses specific terms whose definitions are as follows:

- **Technology:** application of advanced scientific knowledge, engineering principles, and innovative methodologies to develop and implement devices, systems, and processes to reduce contaminants from the air.
- **Strategy** - A planned approach or set of actions designed to achieve specific goals related to improving indoor air quality by effectively using filtration and air cleaning technologies.
- **Safe** - Safe refers to filtration and air cleaning technologies and strategies to reduce indoor air contaminants without causing health risks and other risks such as reduced comfort or work performance to occupants and/or damage to the indoor/outdoor environments.
- **Unsafe** – Unsafe filtration and air cleaning devices are those that do not meet safety standards or pose risks to occupants or the environment. Unsafe devices are also those that may be ineffective ~~and~~ or unproven.



## ASHRAE Takes The Positions That:

1. Filtration and air cleaning effectively improve air quality when used properly.
2. Caution should be exercised when using filtration and air cleaning technologies and strategies that may be ineffective or unsafe.
3. Filtration and air cleaning devices that produce ~~ions, hydroxyl radicals, hydrogen peroxides, other reactive oxygen species (ROS), ozone, and other~~ compounds to remove or inactivate target pollutant(s) either at the device, in a duct, or in space should not only be used unless if proven safe.
4. Filtration and air cleaning performance should be based on nationally or internationally recognized and published standardized tests from ASHRAE and other independent organizations or agencies. A detailed explanation of alternative tests and their correspondence to standardized tests should accompany performance testing results when such tests do not exist.
5. In-situ effectiveness and safety of filtration and air cleaning technologies are a strong function of air distribution, maintenance, aging, and degradation impacts, component face air velocities, system air flow rates, installation, space volume, and other application and contextual factors. Accordingly, filtration and air cleaning effectiveness and safety in a specific application should not be assumed equivalent to performance determined using controlled laboratory tests under specific conditions.
6. All electrically powered filtration and air cleaning devices should only be used when tested and labeled for ozone emission in accordance with Underwriters Laboratory (UL) 2998 or equivalent international standardized test to avoid hazards associated with ozone.
7. Secondary consequences over the lifetime of filtration and air-cleaning devices and under all conditions of use should be considered, including, among others, maintenance implications, harmful by-products or other compounds added to the air, energy implications, odors, noise, material degradation, and other aging issues, including reduced air cleaning performance.
8. Efficiency tests, reduction of target contaminant concentrations, or other performance data of filtration and air cleaning devices alone should not be used to make claims of direct health impacts.

## ASHRAE Recommends That:

1. Research to quantify the benefits of filtration and air cleaning should be supported.
2. Research that predicts by-products generated by filtration and air cleaning during the whole service life and their potential risks to human health should be conducted.
3. Identification of application-relevant conditions for laboratory testing for filtration and air cleaning should be pursued so that the test results can predict the behavior of filtration and air cleaning technologies more closely in as many real-world applications as possible.
4. The assessment of all filtration and air cleaning devices should be expanded to include the whole service life and not only initial conditions to determine whether effectiveness and safety change over the lifetime of a device. Contaminants with properties similar to those of typical outdoor and indoor environments shall be used for this assessment.
5. Actions related to the laboratory to field scaling of filtration and air cleaning devices should be defined.
6. Additional standards and guidelines for filtration and air cleaning should be developed covering a wide variety of technologies and challenge contaminants, especially for the technologies for which no current standards are available.
7. Review and revision of existing standards and guidelines for filtration and air cleaning should be supported to address new technologies, knowledge, contaminants, and applications.
8. User guidelines for filtration and air cleaning should be developed and applied to pollutant load calculations, design, selection, installation, operation, maintenance, aging, and energy use where needed.
9. In-situ tests should be developed to evaluate filtration and air-cleaning device performance in specific settings, ideally utilizing low-cost instrumentation to minimize barriers to application.
10. A standard protocol should be developed for estimating the reduction of health risks using the documented laboratory performance of filtration and air cleaning in removing specific air pollutants, either through direct assessment of health effects (e.g., using human subjects or animal models) or by modeling.
11. The methodology should be developed to estimate the potential health benefits of removing pollutants by filtration and air cleaning compared with other methods, such as ventilation with outdoor air, as well as energy cost and carbon impacts.

12. Research should be conducted to assess the impact of filtration and air cleaning in a space on air distribution, including, among others, studying airflow patterns and the impact on the performance of filtration and air cleaning and ventilation effectiveness.
13. Research should be conducted on integrating air cleaning technologies with building ventilation and HVAC systems to optimize air distribution and indoor air quality.
14. Research on the impact of air cleaning technologies on decarbonization, building energy consumption, and overall environmental sustainability should be conducted.

## BIBLIOGRAPHY

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Alavy M, Siegel JA. 2019. IAQ and energy implications of high-efficiency filters in residential buildings: A review (RP-1649). *Science and Technology for the Built Environment*, 25(3), 261- 271. DOI: 10.1080/23744731.2018.1526012

Harriman, Lew; Stephens, Brent, PHD; Brennan, Terry. Sept 2019. *New Guidance for Residential Air Cleaners*. ASHRAE Journal; New York Vol. 61, Iss. 9,: 14-16,18,20-23.

Marval J, Tronville P. 2022. Ultrafine particles: A review about their health effects, presence, generation, and measurement in indoor environments. *Building and Environment*, 216, 108992, DOI: 10.1016/j.buildenv.2022.108992.

Mo, J., Zhang, Y., Xu, Q., Lamson, J.J. and Zhao, R., 2009. Photocatalytic purification of volatile organic compounds in indoor air: A literature review. *Atmospheric environment*, 43(14), pp.2229-2246.

Zhang, Y., Mo, J., Li, Y., Sundell, J., Wargocki, P., Zhang, J., Little, J.C., Corsi, R., Deng, Q., Leung, M.H. and Fang, L., 2011. Can commonly used fan-driven air cleaning technologies improve indoor air quality? A literature review. *Atmospheric Environment*, 45(26), pp.4329-4343.

ASHRAE Fundamentals and Equipment should be referred to

2023 ASHRAE Handbook—HVAC Applications 47. Air Cleaners for Gaseous Contaminants

2023 ASHRAE Handbook—HVAC Applications 62. Ultraviolet Air and Surface Treatment

2023 ASHRAE Handbook—HVAC Applications 66. In-Room Air Cleaners

2021 ASHRAE Handbook—Fundamentals 11. Air Contaminants

2020 ASHRAE Handbook—HVAC Systems and Equipment 17. Ultraviolet Lamp Systems

2020 ASHRAE Handbook—HVAC Systems and Equipment 29. Air Cleaners for Particulate Contaminants

## ADDITIONAL ASHRAE RESOURCES

ASHRAE Standards dealing with filtration and air cleaning:

ASHRAE. 2024. ANSI/ASHRAE Standard 185.3 Method of Testing Commercial and Industrial In-Room Air-Cleaning Devices and Systems for Microorganism Bioaerosol Removal or Inactivation in a Test Chamber.

ASHRAE. 2022. ANSI/ASHRAE Addendum c to ANSI/ASHRAE Standard 52.2-2017. ASHRAE. (this will be incorporated into the next printing of 52.2)

ASHRAE. 2022. ANSI/ASHRAE Standard 62.2-2022, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Atlanta: ASHRAE.

ASHRAE. 2021. ANSI/ASHRAE/USGBC/IES Standard 189.1-2021, Standard for the Design of High-Performance Green Buildings, Except Low-rise Residential Buildings. Atlanta: ASHRAE.

ASHRAE. 2000. ASHRAE Standard 185.1-2000, Method of Testing UVC Lights for use in Air Handling Units or Air Ducts to Inactivate Airborne Microorganisms. Atlanta: ASHRAE.

ASHRAE. 2017. ANSI/ASHRAE Standard 52.2-2017, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size. Atlanta: ASHRAE.

ASHRAE. 2016. ANSI/ASHRAE Standard 145.2-2016, Laboratory Test Method for Assessing the Performance of Gas-Phase Air-Cleaning Systems: Air-Cleaning Devices. Atlanta: ASHRAE.

ASHRAE. 2015. ANSI/ASHRAE Standard 145.1-2015, Laboratory Test Method for Assessing the Performance of Gas-Phase Air-Cleaning Systems: Loose Granular Media. Atlanta: ASHRAE.

ASHRAE Guidelines and User's Manuals dealing with filtration and air cleaning:

ASHRAE. 2012. ASHRAE Guideline 26-2012, Guideline for Field Testing of General Ventilation Filtration Devices and Systems for Removal Efficiency In-Situ by Particle Size and Resistance to Airflow. Atlanta: ASHRAE.

ASHRAE. 2010. 62.1 User's Manual. Atlanta: ASHRAE.

ASHRAE. 2009. ASHRAE Guideline 29, Guideline for Risk Management of Public Health and Safety in Buildings. Atlanta: ASHRAE.

ASHRAE. 2009. The Indoor Air Quality Guide: Best Practices for Design, Construction and Commissioning. Atlanta: ASHRAE.

## OTHER RESOURCES

List of ASHRAE cognizant committees:

TC 2.3, Gaseous Air Contaminants and Gas Contaminant Removal Equipment

TC 2.4, Particulate Air Contaminants and Particulate Contaminant Removal Equipment

TC 2.9, Ultraviolet Air and Surface Treatment

TRG2.RAST Reactive Air and Surface Treatment

SSPC 52.2, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size

SSPC 62.1, Ventilation for Acceptable Indoor Air Quality

SSPC 62.2, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential

Buildings SSPC 241, Control of infectious aerosols.

SSPC 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings

SSPC 145, Test Method for Assessing the Performance of Gas Phase Air Cleaning Equipment

SSPC 170, Ventilation of Health Care Facilities

SPC 180, Standard Practice for Inspection and Maintenance of Commercial-Building HVAC Systems

SSPC 185 Method of Testing Ultraviolet Sources for Use in HVAC&R Units or Air Ducts on Irradiated Surfaces. Includes 185.1, 185.2, 185.3, and 185.4

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

GPC 35P - Proposed Guideline - Method for Determining the Energy Consumption Caused By Air-Cleaning and Filtration Devices

List of selected research projects sponsored by ASHRAE and dealing with the topic of filtration and air cleaning:

ASHRAE 2023. RP-1838 Emerging Gas-phase Electronic Filtration Technologies and ASHRAE 145.2 Test Standard

ASHRAE 2023. RP 1720 Validation of Gas-Phase Air-Cleaner Performance Test Method (Standard 145.2) by Laboratory Testing of Commercially Available Filtration Devices

ASHRAE 2023. RP 1784 Repeatability and Reproducibility Assessment of ASHRAE Standard 52.2, as Currently Amended

ASHRAE 2020. RP-1734 Reproducing a Representative Urban Atmospheric Aerosol Distribution at High Concentration in the Laboratory for Air Filter Aging to be used in ASHRAE GPC 35P for Determining the Energy Consumption Caused by Air Filters

ASHRAE 2019 RP-1649 IAQ and Energy Implications of High-Efficiency Filters in Residential Buildings

ASHRAE 2017. 1738-RP: Field Measurements and Modeling of UVC Cooling Coil Irradiation for HVAC Energy Use Reduction

ASHRAE. 2013. RP-1557, Evaluation Lab Comparison of Relative Performance of Gas Phase Filtration Media at High and Low Challenge Concentrations. Atlanta: ASHRAE.

ASHRAE. n.d. RP-1457, By-product Production from Photocatalytic Oxidation Associated with Indoor Air-Cleaning Devices. Atlanta: ASHRAE.

ASHRAE. 2004. RP-791(TRP-1098), Field test methods to measure gaseous contaminant removal effectiveness of gas phase air filtration equipment. Atlanta: ASHRAE.

ASHRAE. 2004. RP-1098, Field Test Methods To Measure Contaminant Removal Effectiveness Of Gas Phase Air Filtration Equipment; Phase II Of 791-RP. Atlanta: ASHRAE.

ASHRAE. 2003. RP-1134, Evaluation Of Photocatalytic Air-Cleaning Capacity. Atlanta: ASHRAE.

ASHRAE. 2001. RP-961, Identification Of Contaminants, Exposures, Effect And Control Options For Construction/ Renovation Activities, Phase II (804-RP). Atlanta: ASHRAE.

ASHRAE. 1997. RP-792, evaluation of test methods for determining the effectiveness and capacity of gas phase air filtration equipment for indoor air applications (Phase II). Atlanta: ASHRAE.

ASHRAE. 1995. RP-804, Identification Of Contaminants, Exposures, Effect And Control Options For Construction/Renovation Activities, Phase I. Atlanta: ASHRAE.

ASHRAE. 1994. RP-674, Evaluation Of Gas Phase Air Filtration Equipment As Used In Common Building Applications. Atlanta: ASHRAE.

ASHRAE. 1993. RP-625, Matching filtration to health requirements, Phase I. Atlanta: ASHRAE.

ASHRAE. 1993. RP-625, Matching filtration to health requirements, Phase II. Atlanta: ASHRAE.

ASHRAE. 1984. RP-268, Development of test method for gaseous contamination removal devices. Atlanta: ASHRAE.

#### OTHER RESOURCES

UL 2998 Environmental Claim Validation Procedure (ECVP) for Zero Ozone Emissions from Air Cleaners

## DOCUMENT REVISION COMMITTEE ROSTER

*The ASHRAE Position Document on Filtration and Air Cleaning was developed by the Society's Position Document Revision Committee, which was formed on Date (February 2, 2021), with Pawel Wargocki as its chair.*

**Pawel Wargocki, Chair**

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**Marwa Zaatari**

D Zine Partners  
Austin, TX, USA

### Cognizant Committees

*The chair of the Environmental Health Committee also served as an ex-officio member.*

**William Bahnfleth**

Pennsylvania State University  
University Park, PA, USA



## DOCUMENT HISTORY

Note: ASHRAE's Technology Council and the cognizant committee recommend revision, reaffirmation, or withdrawal every 30 months. The history of this position document is described below:

01/29/2015—BOD approves Position Document titled Filtration and Air Cleaning

01/23/2018 - Technology Council approves reaffirmation of Filtration and Air Cleaning position document.

02/02/2021 - Technology Council approves reaffirmation of Filtration and Air Cleaning position document.

01/24/2024 - Technology Council approves reaffirmation of Filtration and Air Cleaning position document.