

ASHRAE TC 5.5 Air-to-Air Energy Recovery
ASHRAE 2020 Annual Conference, Virtual
June 18, 2020 1:00 PM-4:00 pm EST

DRAFT MINUTES

These are draft minutes and are not considered final until approved by vote of TC5.5

1. Call to Order / Welcome (Exhibit Slides 1-2.)

The virtual meeting was called to order at 1PM Eastern time.

2. TC Scope (Exhibit Slide 3)

TC 5.5 is concerned with air-to-air heat exchangers, their application and cost benefit relationship. It includes consideration of the needs and procedures for standardization and testing, rating and terminology applicable to air-to-air energy recovery.

3. Roll Call of Voting Members

| | | |
|---------------------------|--------------------|---|
| Matthew Friedlander | Voting (7/31/2020) | Chair (7/31/2020) Standards Subcommittee Chair |
| Adam Fecteau | Voting (6/30/2023) | Vice Chair (7/31/2020) 90.1 Liaison |
| Mohammad Afshin | Voting (6/30/2022) | Secretary (7/31/2020) 62.1 Liaison |
| Prakash Dhamshala | Voting (6/30/2022) | Handbook Liaison |
| John Dieckmann | Voting (6/30/2022) | Research Subcommittee Chair |
| Marcus D'Arcy | Voting (7/31/2020) | Member |
| Drake Erbe | Voting (6/30/2021) | Member |
| James Piscopo | Voting (7/31/2020) | Member |
| Kristin Sullivan (absent) | Voting (6/30/2022) | Member |
| John Bade | Voting (6/30/2023) | Member |
| Carey Simonson | Voting (6/30/2023) | Member |
| Marc Tardif | Voting (6/30/2023) | Member |

Dates indicate end of term.

With eleven of twelve voting members present, quorum was achieved.

4. Introductions of other participants:

| | |
|---------------------------------|--------------------------|
| Andy Kebernik | James Battaglia |
| Birol Yavuz | Jay Kohler, TAC Chair |
| Brandon Damas, Webmaster | Justin Berquist |
| Byron Horak | Larry Smith, TAC Liaison |
| Carey Simonson | Mike Scofield |
| Chris Glover | Paul Pieper, ALI Liaison |
| GD Mathur, Handbook SC Chair | Yiteng Ma |

5. Agenda Review and Adoption. (Exhibit Slide 5)

TAC Liaison Larry Smith pointed out that Agenda Item 20 was not needed as it is the responsibility of the Technical Activities Committee, not the TC, to determine whether the TC should Continue, Merge, or Dissolve.

Motion to approve Agenda with deletion of Item 20 by Fecteau, seconded by Afshin. Motion approved 10/CNV/0/0.

6. Approval of Minutes (Exhibit Slide 6)

a. TC5.5 Committee Meeting, May 11, 2020

Motion to approve minutes Simonson, seconded by Fecteau. Motion approved 10/CNV/0/0.

7. Chair's Report

See Exhibit Slides 7 – 28)

SARS-CoV-2Response

8. TC5.5 Activities in support of ASHRAE Epidemic Task Force and Building Readiness Documents (Matthew Friedlander)

See Exhibit Slides 29 – 37).

A FAQ to be forwarded to the Building Readiness Team was discussed and word-smithed. Edits are shown on Exhibit Slide 38. Final version is shown below.

Q: The **April 14 2020 ASHRAE Position Document on Infectious Aerosols** recommends to “*Bypass energy recovery ventilation systems that leak potentially contaminated exhaust air back into the outdoor air supply*”. How can I determine if exhaust air is leaking into the outdoor air supply in my energy recovery ventilation system?

A: The TC5.5 Practical Guidance for Epidemic Operation of ERVs <<insert link>> includes detailed discussion of the mechanics for potential leakage in ERVs and describes methods to determine on a system level whether there is leakage from exhaust to supply, and to estimate the leakage volume. It is also worth considering other elements in the system design, such as recirculated air, can have a greater impact.

Motion to approve the FAQ as edited by Dieckman, seconded by Tardiff. Motion approved 10/CNV/0/0.

Liaison Reports

9. Technical Activities Council (TAC) Liaison (Larry Smith)

See Exhibit Slide 39.

Announced that the TC Reorganization group can be emailed at reorg@ashrae.net, and invited input regarding reorganization topics.

10. ASHRAE Learning Institute (Paul Pieper)

See Exhibit Slides 40-43.

11. SSPC 90.1 (Adam Fecteau)

See Exhibit Slides 40-45.

Members are advised to provide input on addendum n.

12. Standard 62.1 (Mo Afshin)

See Exhibit Slides 46-47. Members are advised to maintain awareness of activities in 62.1 with regards to draft addenda ag and ak, and to DA19.

13. Standard 205P Working Group (Matthew Friedlander in Kristin Sullivan's absence)

See Exhibit Slides 48 – 51.

Members are advised that the 2nd Standard 205P Draft is in Public Review until July 28.

Subcommittee Reports

14. Handbook (G.D. Mathur)

See Exhibit Slides 52 – 57 for report and Strategic Plan.

A suggestion was received: to work on an Energy Recovery Design Guide (similar to the DOAS design guide book). John Dieckmann described how this a publication project can be initiated through a process similar to a Research Topic Acceptance Request (RTAR); this process is called a Publication Topic Acceptance Request and is advanced through the ASHRAE Publication and Education Council (PEC)

ACTION: This suggestion should be discussed in sub-committee and considered for action. See Exhibit Slide 52 for Chair's nominations to Handbook Subcommittee. Carey Simonson also was asked to serve and accepted.

15. Program (Matthew Friedlander in Ronnie Moffitt's absence)

See exhibit Slides 58-62).

ACTION: All members are requested to forward any proposals for seminars, workshop, forum topics, debates or panel proposals to Program SC Chair Moffitt by early July.

ACTION: Paul P. to explore the idea of using portions of ALI presentation for Chpater presentations, etc. Paul to check with ALI to see if this is a possibility

16. Research (John Dieckmann)

See Exhibit Slide 63 for Chair's nominations to the Research SC.

See Exhibit Slides 64 – 66 for the Research SC Chair Report.

17. Standards (Matthew Friedlander)

See Exhibit Slides 67 – 70

18. Website <http://tc0505.ashraetcs.org/> (Matthew Friedlander in Brandon Damas' absence)

See Exhibit Slide 71.

ACTION: Damas/Friedlander consider posting past TC5.5 seminars and presentations on the website.

19. Membership (Matthew Friedlander)

See Exhibit Slides 72 – 76.

Roster rollover date has been pushed back to August 1 this year. Appointments to replace voting members rolling off will be announced later.

It was proposed to form an executive committee.

“To form an executive committee that would be responsible for nominating new voting members and executive officers and development of members for various executive to sub-committee positions.”

Motion by Mo Afshin, John Dieckmann Seconded. Motion carried 10/CNV/0/0,

ACTION: Matthew F to contact TAC liaison Larry Smith for instructions to create the membership committee

It was noted that this is the last scheduled meeting over which Chair Matthew Friedlander is to preside. The Chair expressed his appreciation of the opportunity to work with the members of the TC over the last three years.

Continuation of TC5.5

20. Required Annual Review of TC5.5

~~ASHRAE's Technical Activities Committee requires that for each Technical Committee, the Committee Chair and Committee Membership shall evaluate their progress in accomplishing the purpose for which they were constituted and recommend one of the following actions: Continue, Merge, or Dissolve.~~

As noted above this topic was removed from the Agenda.

New Business

There was no new business.

Next Meeting

Next face-to-face meetings will be at the 2021 Winter Meeting, January 23rd-27th, in Chicago, IL

Minutes prepared and submitted by Mo Afshin, Secretary and Matthew Friedlander, Chair TC5.5.



TC5.5

Annual Meeting

June 18, 13:00 to 16:00 Eastern Time

**In all your interactions at these meetings,
please remember...**

Code of Ethics

As members of ASHRAE or participants in ASHRAE activities, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct.

A. Efforts of the Society, its members, and its bodies shall be directed at all times to enhancing the public health, safety and welfare.

B. Members and organized bodies of the Society shall be good stewards of the world's resources including energy, natural, human and financial resources.

C. Our products and services shall be offered only in areas where our competence and expertise can satisfy the public need.

D. We shall act with care and competence in all activities, using and developing up-to-date knowledge and skills.



1: Call to Order

A five-minute break will be taken at about 14:30 eastern time.

2: Scope of the Technical Committee

TC 5.5 is concerned with air-to-air heat exchangers, their application and cost benefit relationship. It includes consideration of the needs and procedures for standardization and testing, rating and terminology applicable to air-to-air energy recovery.



3: Roll Call of Voting Members

| | |
|---------------------|--------------------|
| Matthew Friedlander | Voting (7/31/2020) |
| Adam Fecteau | Voting (6/30/2023) |
| Mohammad Afshin | Voting (6/30/2022) |
| Prakash Dhamshala | Voting (6/30/2022) |
| John Dieckmann | Voting (6/30/2022) |
| Marcus D'Arcy | Voting (7/31/2020) |
| Drake Erbe | Voting (6/30/2021) |
| James Piscopo | Voting (7/31/2020) |
| Kristin Sullivan | Voting (6/30/2022) |
| John Bade | Voting (6/30/2023) |
| Carey Simonson | Voting (6/30/2023) |
| Marc Tardif | Voting (6/30/2023) |



4: Other Introductions

- As your name is called from the list of attendees, please take yourself off mute, and briefly identify yourself and your affiliation.

During the meeting:

- Please identify yourself when speaking.
- Please stay muted when not speaking.



5: Adopt Agenda

ASHRAE TC 5.5 Air-to-Air Energy Recovery ASHRAE 2020 Annual Conference, Virtual

| Events | Time | Location* |
|-----------------------------------|-----------------------------------|---------------------|
| TC 5.5 Air-to-Air Energy Recovery | June 18, 2020 1:00 PM-4:00 pm EST | Virtual, link below |

<https://zoom.us/j/93831660519?pwd=U1ZtQWJDenBJQ0xZK0k1NUpscHJkUT09>

Agenda TC 5.5 Full Meeting

Launch [20 minutes total]

1. Call to Order / Welcome
2. TC Scope

TC 5.5 is concerned with air-to-air heat exchangers, their application and cost benefit relationship. It includes consideration of the needs and procedures for standardization and testing, rating and terminology applicable to air-to-air energy recovery.
3. Roll Call of Voting Members (exhibit 2)
4. Introductions of other participants
5. Agenda Review and Adoption
6. Approval of Minutes
 - a. TC5.5 Committee Meeting, May 11, 2020
7. Chair's Report

SARS-CoV-2 Response [40 minutes total]

8. TC5.5 Activities in support of ASHRAE Epidemic Task Force and Building Readiness Documents

Liaison Reports [50 minutes total]

9. Technical Activities Council (TAC) Liaison (Larry Smith)
10. ASHRAE Learning Institute (Paul Pieper)
11. SSPC 90.1 (Adam Fecteau)
12. Standard 62.1 (Mo Afshin)
13. Standard 205 Working Group (Matthew Friedlander in lieu of Kristin Sullivan)

Subcommittee Reports [50 min total]

14. Handbook (G.D. Mathur)
15. Program (Matthew Friedlander in lieu of Ronnie Moffitt)
16. Research (John Dieckmann)
17. Standards (Matthew Friedlander)
18. Website <http://tc0505.ashraetcs.org/> (Brandon Damas)
19. Membership (Matthew Friedlander)

Roster rollover date has been pushed back to August 1 this year.

Continuation of TC5.5 [15 min total]

20. Required Annual Review of TC5.5

ASHRAE's Technical Activities Committee requires that for each Technical Committee, the Committee Chair and Committee Membership shall evaluate their progress in accomplishing the purpose for which they were constituted and recommend one of the following action: Continue, Merge, or Dissolve.

New Business

Discussion should be after a motion and second.

Next Meeting

Next face-to-face meetings will be at the 2021 Winter Meeting, January 23rd-27th, in Chicago, IL

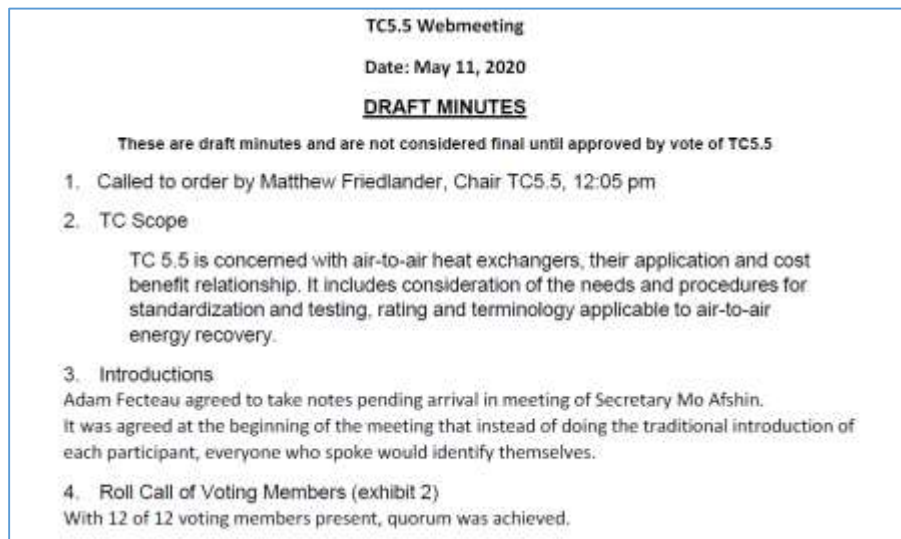
- Matthew Friedlander, Chair TC 5.5
2020-01-15

Show the Agenda!



6: Approval of Minutes:

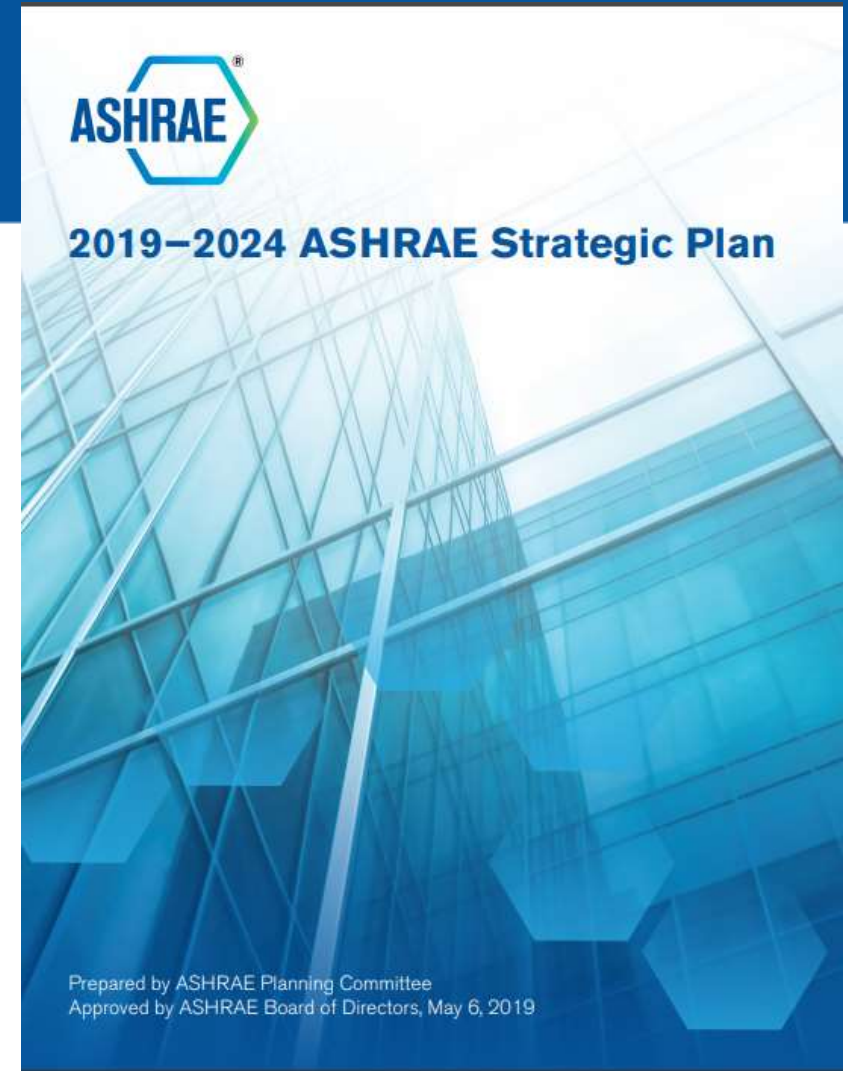
- Draft Minutes of TC5.5 Committee Meeting May 11, 2020
- A motion and second will be required, discussion of minutes can follow



Show the Minutes!

7: Chair's Report

- Important Dates
- ASHRAE Strategic Plan
- Conferences
- Research Administration Committee
- Residential Buildings Committee
- Environmental Health Committee



Virtual Meeting Dates

- TC/TRG/MTG Meetings from June 1 to July 21
- TAC - June 25 9AM to noon and 1 to 3 PM
- TAC – July 22, 9 AM to noon
- TC and TAC Roster rollover date is August 1
- TC Program SubC Training Tuesday, July 7 1:00 – 2:00pm
- Sec #5 Research SC Chairs Wednesday, July 15 8:00am - 10:00am



2019–2024 ASHRAE Strategic Plan Mission, Vision and Values

- Mission - To serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration and their allied fields.
- Vision - A healthy and sustainable built environment for all.
- Values – Excellence, Commitment, Integrity, Collaboration, Volunteerism, Diversity



2019–2024 ASHRAE Strategic Plan Goals

1. Position ASHRAE as an Essential Knowledge Resource for a Sustainable, High-Performance Built Environment
2. Maximize Member Value and Engagement
3. Optimize ASHRAE's Organizational Structure to Maximize Performance



2019–2024 ASHRAE Strategic Plan Areas & Initiatives

Initiative Area: Built Environment of the Future

1. Resilient Buildings and Communities
2. Indoor Environmental Quality

Initiative Area: Future of ASHRAE

3. Organizational Streamlining
4. Improve Chapter Engagement, Capacity and Support

<https://www.ashrae.org/File%20Library/About/Strategic%20Plan/Strategic-Plan-Final.pdf>



2020 Virtual Conference

What to Expect

**80 on-demand sessions + 12 live sessions = 92 technical sessions
at your fingertips for 18 months.**

On-demand Technical Program: Available Monday, June 22

- **80 sessions accessible on your terms for 18 months**
- Conference proceedings. Download the technical papers, conference papers and extended abstracts.

Live Four Day Event: Monday, June 29 - July 2

- **12 featured technical sessions presented live and available for download**
- Sessions addressing the latest information relating to the COVID-19 pandemic
- Live forum for Q&A with speakers
- Access to scheduled live chat sessions with speakers for on-demand sessions
- Virtual networking happy hours with specific topics and social focus
- Leadership Moments providing updates from Society leaders

- **TC Program Subcommittee Training - Tuesday, 7/7/2020 1:00-2:00 PM EDT**



Upcoming Topical Conferences

| Date | Conference | Location |
|-------------------------|--|-----------------|
| August 12 – 14, 2020 | 2020 Building Performance Analysis Conference & SimBuild Co-organized by ASHRAE and IBPSA-USA | Chicago, IL |
| September 14 – 16, 2020 | IAQ 2020: Indoor Environmental Quality Performance Approaches | Athens, Greece |
| October 1 – 2, 2020 | The Fourth International Conference on Efficient Building Design | Beirut, Lebanon |
| August 15 – 18, 2021 | Ventilation 2021: 13th International Industrial Ventilation Conference for Contaminant Control | Toronto, Canada |
| January 23-27, 2021 | 2021 ASHRAE Winter Conference & AHR Expo | Chicago, IL |

<https://www.ashrae.org/conferences/topical-conferences>



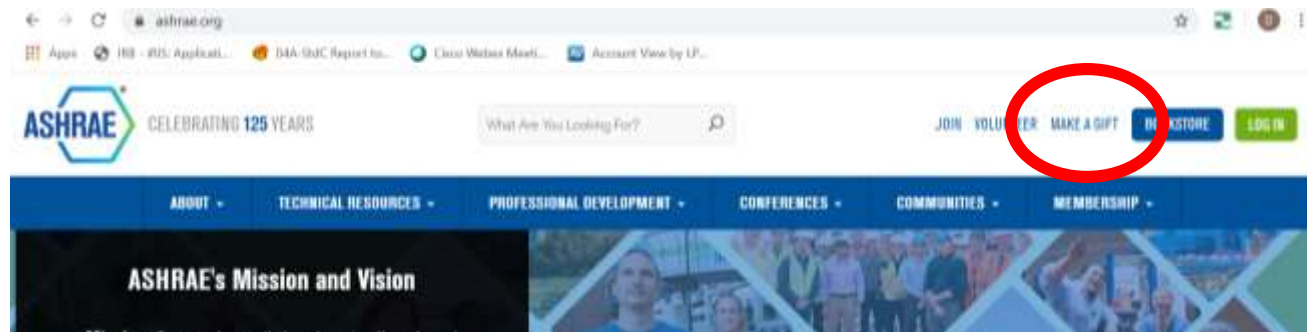
Research Administration Committee (RAC): Budget

- Typically \$2.6M - \$2.7M per year
 - Donations
 - Research Promotion sponsored events
 - AHR Expo contribution
- Funds collected in a given SY becomes RAC budget in next SY
- Funds:
 - Research Projects – 12-15 new projects per year
 - Grants and Awards
 - Innovative Research Grants (\$125k over 3 years)
 - New Investigator Award (\$125k over 3 years)
 - Grant In Aid – Typically 20-25 per year @ \$11,500



Fiscal Impact from Covid-19

- Reduced revenue from closures, cancellations, austerity
- Top Priority: Ensure continuity of core function
 - TC developed research addresses members most direct needs
- Unsolicited Research Projects (URPs) will not be considered for now
- Grants and awards will be delayed until budget is approved, may be suspended
- Encourage your members to donate to ASHRAE research!



Residential Buildings Committee

- Currently in its 5th year as a standing committee under Tech Council
- Mission is to help ASHRAE have a greater impact in the residential space
 - Internally – help coordinate and facilitate residential activities that help stakeholders
 - Externally – communicate with stakeholders to identify needs and disseminate ASHRAE products

<https://www.ashrae.org/communities/committees/standing-committees/residential-building-committee-rbc>



Residential Buildings Committee

- In the process of analyzing input from external stakeholders regarding priority needs of the residential sector
 - Identify those suited to ASHRAE
 - Prioritize
- In the process of identifying priority TCs for residential activities but which do not have current RBC member – will seek formal liaison



No TC5.5 Liaison to the RBC!

Environmental Health Committee (EHC)

- Re-Organizing EHC to the following sub-committees
 - <https://www.ashrae.org/communities/committees/standing-committees/environmental-health-committee-ehc>
- Policy
 - Identify major environmental health trends impacting HVAC&R
 - Create Recommend policies for Emerging Issues Briefs, Position Documents and RP
- Education
 - IEQ column in the ASHRAE Journal
 - Handbook chapter
- Coordination and Outreach
 - Interaction – internal to ASHRAE committees
 - Interaction - external societies
- ExCom



EHC - Update

- Documents issued in 2020
 - EIB: Pandemic COVID-19 and Airborne Transmission (April 17, 2020)
 - <https://www.ashrae.org/file%20library/technical%20resources/covid-19/eiband-airbornetransmission.pdf>
 - PD: Infectious Aerosols (April 14, 2020)
 - https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf
 - Handbook: 2021 Fundamentals Chapter 10 Indoor Environmental Health
- Documents in draft
 - PD: Indoor Air Quality
 - PD: Environmental Tobacco Smoke
 - PD: Indoor Carbon Dioxide
- To be considered
 - EIB: 3D Printers
 - EIB: Indoor Environmental Impact of Climate Change



Epidemic Task Force (ETF)

- EHC Cognizant to Epidemic Task Force (ETF) per ASHRAE ExCom
 - ETF was established to help deploy ASHRAE's technical resources to address the challenges of the current pandemic and future epidemics as it relates to the effects of heating, ventilation, and air-conditioning systems on disease transmission in healthcare facilities, the workplace, home, public and recreational environments.
- Primary role is for the ETF to communicate with those involved in the built environment:
 - Review all technical questions/requests for technical guidance submitted
 - Coordinating activities of ASHRAE's internal resources
 - Partnering with and monitoring the activities of external organizations, including the more than 60 members of the [ASHRAE Associate Society Alliance \(AASA\)](#) of organizations related to the HVAC&R industry around the world
 - Reviewing, organizing, consolidating and publishing clear and concise summaries with citations of the most relevant information available to the built environment



Epidemic Task Force (ETF) – (cont.)

- Supported expedited update of [Position Document on Infectious Aerosols](#). Board Approved April 14, 2020. (First published in 2009)
- ASHRAE statements on SARS-CoV-2
- Expedited the EIB “Pandemic COVID-19 and Airborne Transmission”
- COVID-19 resources/guidance page [ashrae.org/covid19](https://www.ashrae.org/covid19)
- Answers to over 350 questions to web site (COVID-19@ashrae.org)
- Meetings with AIA, NYSERDA, DOE, IEA
- Partnership with government on HVAC for alternate care facilities (USACE, USAF, USN, NIOSH)
- Reviewed/commented on state guidance (Florida, Michigan)
- Working on...
 - Immediate guidance for current COVID-19 Pandemic
 - Near term guidance for 2nd wave
 - Long term guidance to future proof

Epidemic Task Force (ETF) - Update

Task Force

- Review Public & Industry Needs
- Creates a content development plan
- Assigns Teams work based on Subject Matter Expertise
- Communicates with ASHRAE Leadership and Board of Directors

Subject Matter Teams

- Determines current state of technology and practice and gaps to be filled
- Creates New or Updates Existing Content
- Performs internal PEER Review
- Respond to questions from Industry and public

Task Force

- Team Leaders Perform PEER Review of other team's work
- Coordinates and harmonizes common between teams
- Gives green light to ASHRAE staff to publish content to website
- Coordinates with outside organizations (AIA, BOMA, CIBSE, ETC.)

Communication Team

- Designed website for ease of access and navigation
- Processes content and post to the web
- Develops press releases and public communication strategies

ASHRAE Support Staff

- Tracks Task Force Activities and Deadlines
- Receives questions and sends to SMEs for response
- Develops lists of FAQs for refinement of responses and posting on web

ASHRAE Government Affairs

- Monitors activities of Federal, State, Local and International Governments, Agencies and Policy Makers
- and coordinates with Task Force, SMEs and ASHRAE leadership
- Organizes timely responses to requests for assistance

For technical guidance, visit
ashrae.org/covid19



ASHRAE Epidemic Task Force Full Roster

| Team Members/Contributors | Company | Outside Organization |
|------------------------------------|---------------------------------|----------------------|
| Epidemic Task Force | | |
| Bill Bahnfleth | Penn. State University | |
| Luke Leung | Skidmore Owings & Merrill (SOM) | |
| Max Sherman | Lawrence Berkeley Laboratory | |
| Stephanie Taylor | Taylor Healthcare Consulting | |
| Jason DeGraw | ORNL | |
| Traci Hanegan | Coffman Engineers | |
| Steve Martin | NIOSH | |
| Rick Hermans | Retired | |
| Jim Ridenhour | Fluor | |
| Dennis Knight | Whole Building Systems | |
| Wade Conlan | Hanson Professional Services | |
| Wayne Stoppelmoor | Schneider Electric | |
| Jay Kohler | Consultant | |
| Walid Chakroun | Kuwait University | |
| Steve Hammerling | ASHRAE | |
| Stephanie Reiniche | ASHRAE | |
| Alice Yates | ASHRAE | |
| Vanita Gupta | ASHRAE | |
| Communications Team | | |
| Dennis Knight | Whole Building Systems | |
| Vanita Gupta | ASHRAE | |
| Alice Yates | ASHRAE | |
| Stephanie Reiniche | ASHRAE | |
| Steve Hammerling | ASHRAE | |
| Bill Bahnfleth | Penn. State University | |
| Jeff Littleton | ASHRAE | |
| Grassroots Team | | |
| Rick Hermans | Retired | |
| All 15 Directors & Regional Chairs | Various | |



ASHRAE Epidemic Task Force Full Roster

| Healthcare Team | | |
|-------------------------|--|-------|
| Traci Hanegan | Coffman Engineers | |
| Jeremy Fauber | HEAPY | |
| Michael Sheerin | TLC Engineering Solutions | |
| Paul Supan | American Dental Association Liaison | |
| Jerry Ivey | Willis-Knighton Health System | |
| Wayne Stoppelmoor | Schneider Electric | |
| Roger Lautz | Affiliated Engineers Inc. (AEI) | |
| Melvin Glass | EMC Engineers | |
| Tim Earhart | Retired Consulting Engineer | |
| Frank Mills | Frank Mills Consulting | CIBSE |
| David Eldridge | Grumman/Butkus Associates | |
| Rick Hermans | Retired | |
| Laurence Wilson | WSP | |
| Zaccary Poots | Toro-Aire Inc | |
| Mark Meteyer | Erdman | |
| Steven Welty | Green Clean Air | |
| Robert Block | Robert M. Block | |
| Mike Cummiskey | Public Health Dentist | |
| Residential Team | | |
| Max Sherman | Lawrence Berkeley Laboratory | |
| Rick Karg | Residential Energy Dynamics | |
| Iain Walker | Lawrence Berkeley Laboratory | |
| Steve Emmerich | National Institute of Standards and Technology | |
| Chandra Sekhar | National University of Singapore | |
| Valerie LePrince | PLEIAQ | |
| Brent Stephens | Illinois Institute of Technology | |
| Lew Harriman | Mason Grant | |
| Commercial, Retail Team | | |
| Luke Leung | Skidmore Owings & Merrill (SOM) | |
| Josephine Lau | University of Nebraska Lincoln | |
| Marwa Zaatari | enVerid Systems | |
| Amy Jiron | US DOE | |
| Marcus Bianchi | NREL | |



ASHRAE Epidemic Task Force Full Roster

| | | |
|--------------------------------|------------------------------------|-------|
| Brian Gilligan | GSA | |
| Nicholas Rajkovich | University of Buffalo | |
| Bill Livingood | NREL | |
| Paul Torcellini | NREL | |
| Christian Callaghan | WeWork | |
| Peter Simmonds | Building and Systems Analytics | |
| David Winn | Jacobs Engineering Group | |
| Jennifer Isenbeck | Sodexo – Univ. of Tampa Facilities | |
| Schools Team | | |
| Rick Hermans | Retired | |
| Bruce Lindsay | Brevard Public Schools | |
| Raj Kapoor | Star Consultants Inc. | |
| Keith Hammelman | Cannon Design | |
| David Norvell | University of Central Florida | |
| Chuck Kovac | Daikin Applied | |
| Corey Metzger | Resource Consulting Engineers | |
| Raj Setty | Setty and Associates International | |
| Frank Mills | Frank Mills Consulting | CIBSE |
| John Nix | John Nix Consulting | |
| Kyle Hasenkox | Rocky Point Engineering | |
| Itzak Maor | Smart Buildings Technology | |
| Eric Haley | Baskervill | |
| Julia Keen | Kansas State University | |
| Transportation Team | | |
| Jason DeGraw | ORNL | |
| Donald LeBlanc | National Research Council Canada | |
| Augusto San Cristobal | Bronswerk Marine | |
| Jim Bushnell | HVAC Consulting Services | |
| Byron Jones | Kansas State University | |
| Haven Cassidy | Denver International Airport | |
| Building Readiness Team | | |
| Wade Conlan | Hanson Professional Services | |
| Dennis Knight | Whole Building Systems | |
| Nate Boyd | University of Central Florida | |



ASHRAE Epidemic Task Force Full Roster

| | | |
|--|--------------------------------------|---|
| Sarah Maston | Green Footprints Commissioning, Inc. | |
| Justin Garner | Engineered Air Balance Co., Inc. | AABC |
| Troy Byers | Commissioning Consultants, LLP | ACG |
| Kent Walters | Control Management, Inc. | |
| Jon Sheppard | Atlantic Testing | NEBB |
| Heather Platt | Dewberry | |
| Mike Amstadt | Mead & Hunt | |
| Megan Sterl | Montana State University - Bozeman | |
| John Hamilton | TABB | |
| Ray Bert (corresponding) | AABC, ACG | AABC, ACG |
| Tiffany Suite (corresponding) | NEBB | NEBB |
| Filtration, Air and Surface Disinfection Team | | |
| Steve Martin | NIOSH | |
| Wane Baker | Trane | |
| Jason DeGraw | ORNL | |
| Sam Guzman | American Ultraviolet Company | |
| Dean Saputa | UV Resources | |
| Kathleen Owen | Owen Air Filtration Company | |
| Steven Welty | Green Clean Air | AIHA Healthcare Infectious Diseases Committee |
| Matt Middlebrooks | Filtration Group HVAC | |
| Advocacy/Developing Economies Team | | |
| Walid Chakroun | Kuwait University | |
| Alice Yates | ASHRAE | |
| Resource Inventory Team | | |
| Wade Conlan | Hanson Professional Services | |
| Mat Coalson | Hanson Professional Services | |
| Becca Coalson | ecoPreserve, LLC | |
| Jennifer Leach | United Energy Products | |
| Jon Cohen | ChemTreat | |
| Jason Alphonso | | |
| Literature Review/Scientific Background Team | | |
| Stephanie Taylor | Taylor Healthcare Consulting | |
| Steve Martin | NIOSH | |
| Pawel Wargocki | Technical University of Denmark | |



ASHRAE Epidemic Task Force Full Roster

| External Organization Contacts | | |
|--------------------------------|--|-------|
| Bill Bahnfleth | Penn. State University | |
| Liaisons | | |
| Frank Mills | Frank Mills Consulting | CIBSE |
| Alexander Zhivov | US Army Engineer Research and Development Center | USACE |

8: TC5.5 Activities in support of ASHRAE Epidemic Task Force and Building Readiness Documents

- April 8 – request from ETF for response on ERV questions received via TAC Liaison Larry Smith
- April 9 – meeting of ad hoc group (16) TC5.5 members + (8) others; drafting team formed.

THE REQUEST

- 1 Provide a position paper
- 2 Generate FAQs
- 3 Initiate appropriate Research and/or Literature Search





ASHRAE Position Document on Infectious Aerosols

Approved by ASHRAE Board of Directors
April 14, 2020

Expires
April 14, 2023

ASHRAE's Position Document on Infectious Aerosols

https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf

- Maintain temperature and humidity as applicable to the infectious aerosol of concern.
- Bypass energy recovery ventilation systems that leak potentially contaminated exhaust air back into the outdoor air supply.

TC5.5 Practical Guidance Document

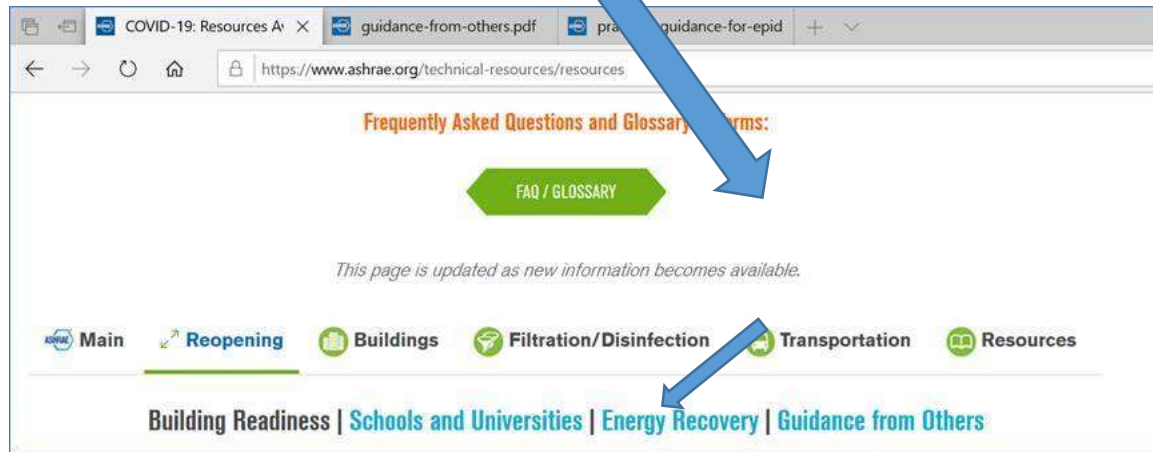
- April 14 – first draft forwarded to ETF, included position statement and FAQs, numerous comments received
- April 20 -- Research SC meeting discussed research responses
- April 30 – meeting of ad hoc group, received guidance from ETF
- May 11 – full TC5.5 meeting attended by 12/12 voting members, drafting team received additional guidance; agreed not to formally constitute a WG
- June 10 – after weeks of collaborative work, the document is accepted by the ETF and published on the website.
- <https://www.ashrae.org/file%20library/technical%20resources/covid-19/practical-guidance-for-epidemic-operation-of-ervs.pdf>

TC5.5 Practical Guidance Document on ASHRAE Website

www.ashrae.org/covid19

OR

<https://www.ashrae.org/technical-resources/resources>



<https://www.ashrae.org/file%20library/technical%20resources/covid-19/practical-guidance-for-epidemic-operation-of-ervs.pdf>



TC5.5 Request to modify Position Document

[Please] consider changing one of the statements pertaining to non-healthcare buildings in the April 14, 2020 ASHRAE Position Document on Infectious Aerosols (page 10):

From:

~~Bypass energy recovery ventilation systems that leak potentially contaminated exhaust air back into the outdoor air supply.~~

To:

To accommodate the aforementioned increase in outdoor airflow rates, while simultaneously maintaining effective control of space temperature and humidity, energy recovery devices should be inspected for proper operation and then left in service as designed. The operational benefits outweigh any modest risk of exhaust air transfer. Any minor leakage of contaminated exhaust air into the outdoor airstream of a properly designed energy recovery device is likely substantially less than the re-entrainment anticipated for most commercial air handling systems (see ASHRAE Research 1635).



TC5.5 FAQs on ERVs

- 1st document had several FAQs, but these were superseded by the more comprehensive final document.
- There are two ERV-related FAQs on the website now, not from TC5.5
- At least three separate discussions about ERVs in addition to the TC5.5 Practical Guidance
 - The April 14 2020 ASHRAE Position Document on Infectious Aerosols
 - The adapted version on the Building Readiness website
 - ASHRAE Healthcare Guidance PDF
- There is a specific request for an FAQ to put the comment on the ASHRAE Position Document into context with the TC5.5 Practical Guidance

Epidemic Task Force or Building Readiness Group FAQs on ERVs

Residential FAQ 9: Is it safe to continue use my ERV or HRV to provide ventilation in my single-family home?

A: Generally, yes. While there can be a potential to recirculate a small amount of contaminated air if someone is infected, the ERV/HRV will still be an overall benefit in single-family homes.

Healthcare FAQ13: Are Energy Recovery devices safe to use when exhaust air has been drawn from areas containing COVID patients?

A. We are not aware of studies documenting risk from contamination of wheels by SARS-CoV-2, but it is certainly something worth investigating. AiCARR, the Italian HVAC society has recommended disabling wheels during the epidemic in its guidance. If used, HEPA filtration of the exhaust air is recommended to prevent potential contamination of the energy recovery media as well as mitigate the potential for any cross over.

Please see the Healthcare Guidance PDF under the "Suggested Approaches" section for the Deactivate or by-pass heat recovery wheels link for additional guidance.

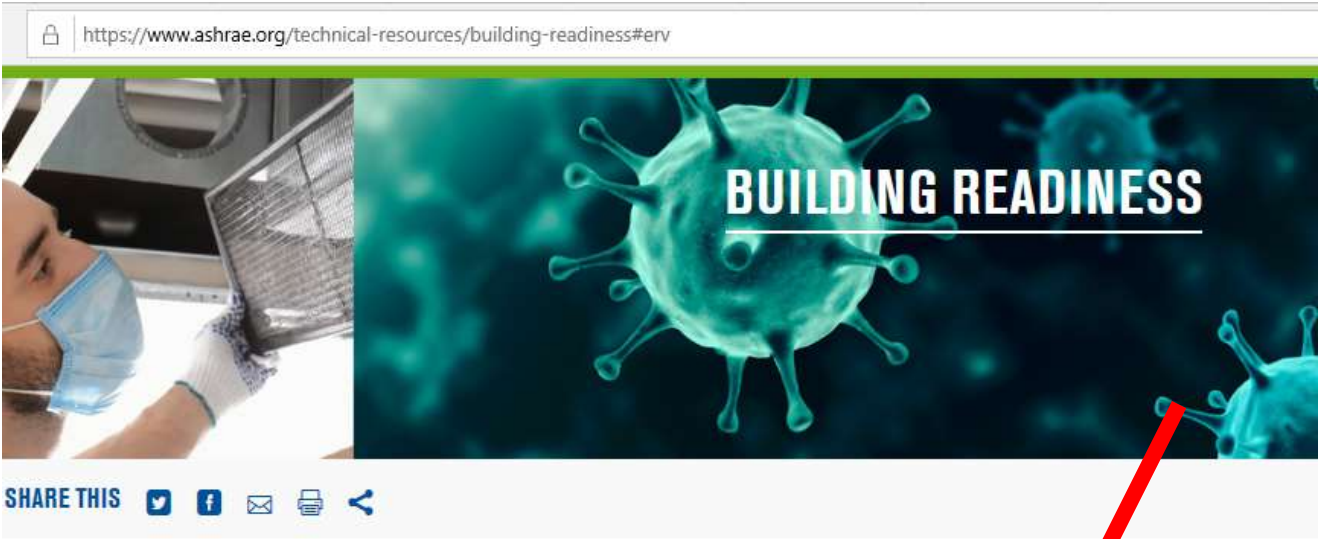


ERVs in the Building Readiness website

Condensed contents of an earlier version of the TC5.5 document. Corresponds roughly to current pages 3 -15.






Abstracted by the Building Readiness Team.

<https://www.ashrae.org/technical-resources/building-readiness#erv>



<https://www.ashrae.org/technical-resources/building-readiness#erv>

BUILDING READINESS

SHARE THIS     

General Information: [Building Readiness Intent](#) | [Building Readiness Team](#) | [Epidemic Conditions in Place \(E\)](#) | [Systems Evaluation](#) | [Building Automation Systems \(BAS\)](#) | [Increased Ventilation](#) | [Ventilation Control](#) | [Upgrading Filtration](#) | [Practical Approach to Increase MERV in an AHU](#) | [Calculation Approach to Increase MERV in an AHU](#) | [Energy Savings Considerations](#) | [Exhaust Air Re-entrainment](#) | [Energy Recovery Ventilation Systems Operational Considerations](#) | [UVGI Systems](#) | [Domestic Water Systems](#) | [Maintenance Checks](#) | [General Recommendations](#) | [Ventilating & Air-Conditioning](#) | [Plumbing Systems](#) | [Shut Down a Building Temporarily](#) | [Systems Manual](#) | [Post-Conditions in Place \(P-ECiP\)](#) | [P-ECiP: Prior to Occupancy](#) | [P-ECiP: Operational Considerations once Occupied](#) | [P-ECiP: Filtration](#) | [P-ECiP: Building Maintenance Program](#) | [P-ECiP: Systems Manual](#) | [References](#) | [Acknowledgements](#)

General Information

Suggested Approaches

Deactivate or bypass heat recovery wheels, if the wheel leaks, in areas with COVID-19 patients.

- Look for these systems in Dedicated Outside Air Units, Energy Recovery Ventilators, and once through units
- Prevent contamination of heat recovery system components
- Utilize HEPA filtration prior to the heat wheel or discharge patient room exhaust directly outdoors instead of to the heat wheel or energy recovery ventilator.
- Evaluate how this will impact heating and cooling capacities of the system
 - Supplement with temporary heating or air conditioning
- For cross-flow heat exchangers, evaluate ability to adjust damper on bypass to increase outside air as much as possible.



ASHRAE's Healthcare Guidance PDF

<https://www.ashrae.org/technical-resources/healthcare-faq>



Proposed FAQ – for discussion and recommendation

Q: The April 14 2020 ASHRAE Position Document on Infectious Aerosols recommends to “*Bypass energy recovery ventilation systems that leak potentially contaminated exhaust air back into the outdoor air supply*”. How can I determine if exhaust air is leaking into the outdoor air supply in my energy recovery ventilation system?

A: The TC5.5 Practical Guidance for Epidemic Operation of ERVs <<insert link>> includes detailed discussion of the mechanics for potential leakage in ERVs. ~~This includes and describes methods to determine on a system level either from design documents or field inspection whether there is leakage from exhaust to supply, and to estimate the leakage volume if it exists, in relationship to the recirculated air volumes in the whole system.~~ It is also worth considering other elements in the system design, such as recirculated air, ~~which~~ can have a greater impact.



9: Technical Activities Council (TAC) Liaison Report

Section 5 TAC Liaison: Larry Smith

Larry will be moving to Vice-Chair of TAC and will be Chairing the TC Reorganization initiative. Congratulations!

Thanks for energizing Section 5!

Our incoming TAC Liaison is not yet announced

I didn't ask Larry for a written report. This slide is a placeholder for his extemporaneous remarks!

10: ASHRAE Learning Institute Liaison Report

TC5.5 ALI Liaison: Paul Pieper

- The courses continue to be offered approximately twice per year.
 - Usually at the Winter meeting in-person
 - either during the Spring or Fall online series offered by ALI.
- The Best Practices course was presented this January in Orlando to about 45 people in attendance (the vast majority were consultants), with some contractors and owners representatives.
 - I had excellent interaction with the students in attendance with questions throughout and at least 30 minutes of questions following the presentation.
 - Please see the attached evaluation and feedback survey provided by ASHRAE.



ALI Course Reviews

2020 Winter - Air-to-Air Energy Recovery Applications: Best Practices; Saturday, February 1, 2020

Q1. INSTRUCTOR - Paul Pieper, P. Eng., Member ASHRAE

| | 5 Strongly Agree | | 4 Agree | | 3 Undecided | | 2 Disagree | | 1 Strongly Disagree | | Total | Weighted Average |
|---|------------------|----|---------|---|-------------|---|------------|---|---------------------|---|----------|------------------|
| The instructor was knowledgeable in the subject. | 84.62% | 22 | 15.38% | 4 | 0.00% | 0 | 0.00% | 0 | 0.00% | 0 | 26 | 4.85 |
| The instructor presented the concepts and principles clearly and unambiguously. | 76.92% | 20 | 19.23% | 5 | 3.85% | 1 | 0.00% | 0 | 0.00% | 0 | 26 | 4.73 |
| The instructor related the material to practical applications. | 76.92% | 20 | 23.08% | 6 | 0.00% | 0 | 0.00% | 0 | 0.00% | 0 | 26 | 4.77 |
| | | | | | | | | | | | Answered | 26 |
| | | | | | | | | | | | Skipped | 0 |

Q2. COURSE CONTENT

| | 5 Strongly Agree | | 4 Agree | | 3 Undecided | | 2 Disagree | | 1 Strongly Disagree | | Total | Weighted Average |
|--|------------------|----|---------|----|-------------|---|------------|---|---------------------|---|----------|------------------|
| The objectives of the training were clearly stated. | 57.69% | 15 | 38.46% | 10 | 3.85% | 1 | 0.00% | 0 | 0.00% | 0 | 26 | 4.54 |
| The content quality and format of the course notes make them valuable. | 61.54% | 16 | 30.77% | 8 | 3.85% | 1 | 3.85% | 1 | 0.00% | 0 | 26 | 4.5 |
| The quality and clarity of the visuals (A/V materials) enhanced my understanding. | 46.15% | 12 | 50.00% | 13 | 3.85% | 1 | 0.00% | 0 | 0.00% | 0 | 26 | 4.42 |
| The organization and order of presentation of the course material suited my needs. | 53.85% | 14 | 42.31% | 11 | 0.00% | 0 | 3.85% | 1 | 0.00% | 0 | 26 | 4.46 |
| The material presented will be of practical use in my work. | 61.54% | 16 | 30.77% | 8 | 7.69% | 2 | 0.00% | 0 | 0.00% | 0 | 26 | 4.54 |
| The degree of difficulty (level) of this training was correct to meet my needs. | 57.69% | 15 | 38.46% | 10 | 3.85% | 1 | 0.00% | 0 | 0.00% | 0 | 26 | 4.54 |
| | | | | | | | | | | | Answered | 26 |
| | | | | | | | | | | | Skipped | 0 |

ALI Course Reviews

Q5. What is the principal activity of your firm?

| Answer Choices | Responses | |
|---|-----------|-----------|
| Consulting (Engineering or Architectural) | 30.77% | 8 |
| Contractor | 7.69% | 2 |
| Building Owner/Facility Management | 19.23% | 5 |
| Manufacturer | 15.38% | 4 |
| Manufacturing Representative | 7.69% | 2 |
| Other (please specify) | | 5 |
| Answered | | 26 |
| Skipped | | 0 |

Q6. Which describes your highest level of education?

| Answer Choices | Responses | |
|--|-----------|-----------|
| High School | 3.85% | 1 |
| Associates Degree/Certificate Program | 7.69% | 2 |
| Bachelor's Degree - Engineering Technology | 0.00% | 0 |
| Bachelor's Degree - Engineering | 53.85% | 14 |
| Bachelor's Degree - Other than Engineering | 3.85% | 1 |
| Master's Degree - Engineering | 15.38% | 4 |
| Master's Degree - Other than Engineering | 7.69% | 2 |
| Doctoral Degree - Engineering | 3.85% | 1 |
| Doctoral Degree - Other than Engineering | 3.85% | 1 |
| Other, please specify | 0.00% | 0 |
| Answered | | 26 |
| Skipped | | 0 |

Response Date Responses Tags

- 1 Feb 26 2020 1 none
- 2 Feb 17 2020 1 Some specific applications for new code compliance would be helpful. Washington State and California are now requiring ERV on all commercial installations.
- 3 Feb 14 2020 1 any subject related to Energy Conservation and Sustainability.
- 4 Feb 11 2020 1 Hand out materials and a simple design problem for demonstration
- 5 Feb 10 2020 1 energy recovery
- 6 Feb 08 2020 1 DOAS Controls
- 7 Feb 05 2020 1 More specific and detailed topics for healthcare system design and medical planning as well with their impact on HVAC systems.
- 8 Feb 05 2020 1 Advances in HVAC technology for single-family homes



ALI Liaison Report Conclusion

- I have significantly updated the course, based on the latest updated standards, such that the Spring Online course had the “Updated” moniker associated with it.
 - The presentation went well, however due to the fact that it was online, and I have not yet received the feedback report, I can’t tell you the exact number and break-out of the attendees.
 - I will provide this feedback to the TC as soon as it becomes available. I did receive some good questions through chat such that I felt the audience was engaged.
- With the upcoming publication of Standard 84, I will be able to update the Fundamentals course with the latest changes.
 - Include the Dual-Mass HX (fixed-bed regenerators) in the presentation
 - Dedicate about a third of the presentation to controls.
 - This update will be submitted such that the updated Fundamentals course can be presented in January 2021. Review by the TC will be required first.
- Any input?



11. SSPC 90.1

- TC5.5 Liaison to SSPC 90.1: Adam Fecteau
- Recent 90.1 meetings on June 1 and June 5
- Proposed addendum i
 - Name : ERV exception in App. G baseline
 - Status : Voted out for publication for public review
 - Content : Fixes an error of Addendum BM (2013). It exempts Laboratory base model to have ERV when the exhaust air volume is 15 000 cfm or more.
 - Impact for TC 5.5 : Positive. Will show more savings for labs equipped with ERVs



ASHRAE 90.1 updates

Proposed addendum k

- Name : ERV Fan power adjustment
- Status : Voted out for publication for public review
- Content : Adds an exception to 11.5.2(h) to limit the fan power of the baseline building to the lesser of the standard fan power limitation without ERV or the actual proposed design (in case it is lower than the standard fan power limitation)
- Impact for TC 5.5 : Neutral

Proposed addendum n

- Name: Maximum DOAS exception
- Status: Voted out for publication for public review
- Content: Provides an exception to the requirement where reheat is limited to 60°F when the building is in cooling mode if the reheat is done with 'series energy recovery' (a defined term).
- Impact for TC 5.5 : Positive. Will increase the use of ERVs in DOAS.



12. Standard 62.1 Ventilation for Acceptable Indoor Air Quality

- TC5.5 Liaison to ASHRAE SSPC 62.1: Mo Afshin
- Main conference meetings scheduled for:
 - July 17, 2020
- Sub committee meeting dates:
 - Research and Education SC: May 17, 2020 – July 8, 2020
 - Ventilation SC: June 19, 2020



SSPC 62.1 Addenda Update

- Relevant Addenda Status:
 - Ongoing work on IAQ guidelines
 - 62.1 Addendum p (EATR not to be considered as ventilation): published
 - 62.1 Addendum ag (minimum distance between S and E Air): sent back to ventilation SC for more research, this may include packaged and AHUs as well
 - 62.1 Addendum ak (Class 2 air leakage): withdrawn, there may be a research project based on this. Assigned to Ventilation SC
 - DA 19 (Class 3 air leakage): Assigned to Research and Education SC

13. Standard 205 Working Group

- Working Group Chair: Kristin Sullivan
 - Ronnie Moffitt
 - Drake Erbe
 - John Dieckmann
 - Marc Tardiff
- 2nd Public Review of Standard 205P is opened May 29, closes July 28

About Standard 205

PURPOSE

To facilitate automated sharing of equipment performance characteristics by defining data models and data serialization formats.

SCOPE

This standard applies to performance data for any HVAC&R or other facility system, equipment, or component.



From the Forward of draft Standard 205

The lack of detailed equipment performance data in readily-usable forms has hampered the (use) of building simulation models since their invention ... Data are often not available or published in inconsistent formats...

Standard 205 addresses this ... by defining common data models and serialization formats for ... equipment performance data, allowing automated exchange among data sources (manufacturers), simulation models, and other engineering applications. The formats and procedures ...are developed under ASHRAE and ANSI consensus processes (by) manufacturers...software developers, and engineering practitioners.

The intent is that all data publishers write common-format data files and all application software will include suitable procedures to read files using that format.



Draft Standard 2nd Public Review Rep

BSR/ASHRAE Standard 205P, *Representation of Performance Data for HVAC&R and Other Facility Equipment*

Public Review Draft
20-May-20 09:12

Representation Specifications drafted for:

- Liquid-cooled chillers
- Unitary cooling air-conditioning equipment
- Fan assembly
- Air-to-air direct expansion coil system
- Motor
- Electronic motor drive

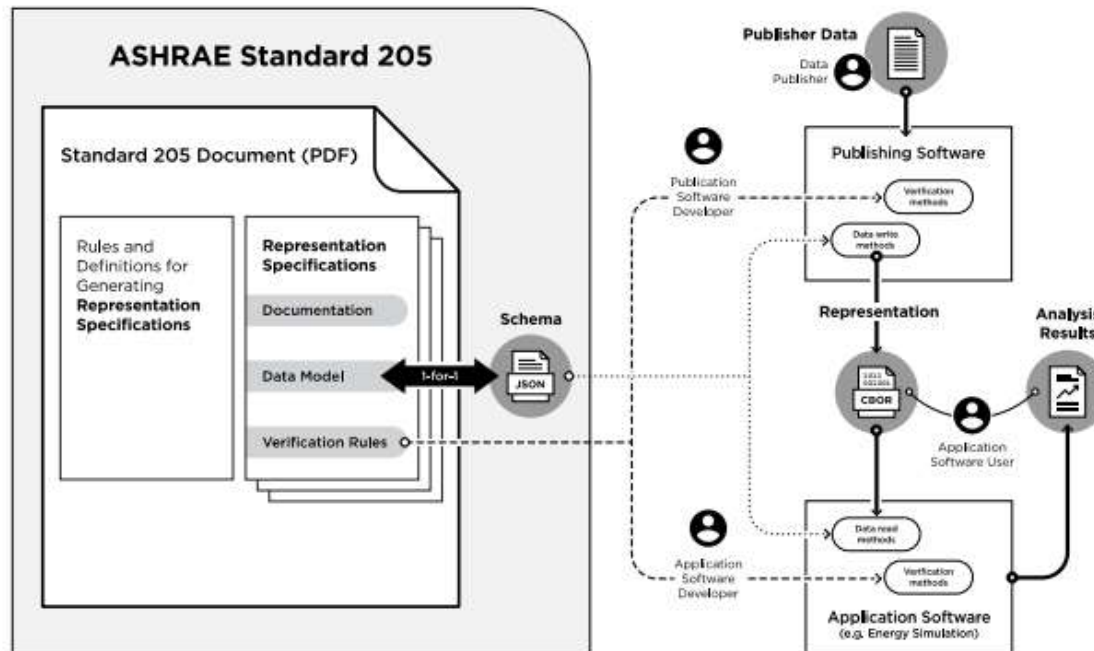


Figure 1. Standard 205 structure and application

14. Handbook SC

- Handbook SC Chair: G.D. Mathur
- Liaison to ASHRAE Handbook Committee: Prakash Dhamshala
- Proposed members:
 - Prakash Damshala
 - Paul Pieper
 - Marcus D'Arcy
 - Mo Afshin
 - Mike Scofield
 - Any volunteers?



- TC5.5 responsible for Chapter 26 – Air-to-Air Energy Recovery Equipment
 - The modified chapter was published in the 2020 Handbook
 - ASHRAE started mailing these handbooks in the first week of June
 - All members should have received the handbooks
 - I have already seen a few errors that need to be fixed
 - I am requesting TC members to review the chapter and provide feedback to me

Main Changes Made to Chapter

- Updated literature review of all energy recovery systems
- Updated thermosiphon section
- Updated heat pipe systems by using as wrap around systems
- Added a section on control strategies for air-to-air energy recovery systems primarily for defrost control
- Added examples for “Desiccant Heat Wheels with Indirect Evaporative Cooler (M-Cycle)” and “Desiccant and Heat Wheels with Humidifier for Winter Heating”

Proposal to improve utility of the HB to Practicing Engineers

- Need to provide solved examples in Excel files
- These could be easily modifiable based on the inputs by the users – we can provide limits to these applications by providing messages
- We can add comments for all variables in the file

Considering splitting into (2) chapters

- In June 2017 at Long Beach, it was decided that we need to split the chapters into two as follows:
 - Chapter 1: Basics of Air to Air Energy Recovery systems in Fundamentals Handbook; and Chapter 2: Advanced systems in the current HB (Chapter 26)
 - The reason is that majority of the undergraduate/graduate students buy the Fundamentals HB while in school. Hence, we need to expose the new engineers to air to air energy recovery technology to show the application of heat transfer principle vis application to air-to-air energy recovery systems.
 - Received positive feedback from Dr. Rick Couvillian, TC 1.3 HB Chair (Heat Transfer):
 - analyzing/sizing air-to-air HXs used for energy recovery followed by a brief description of an energy wheel and how it could be better than a straight HX
 - brief description of how heat pipes could be used to accomplish same
 - analyzing/sizing liquid-to-air HXs in a run-around loop used for same
 - point to Systems and Equipment Handbook, Chap 26 for more info
- In effort to fully represent all technologies the content became too long and Rick's interest waned.
- We have a new TC 1.3 Handbook Subcommittee Chair, Gurunarayana Ravi, so TC5.5 should reach out to him and gauge his interest.

Handbook Strategic Plan

TC5.5 Chair has requested:

Handbook SC prepare a strategic plan for approval at Winter Meeting 2021, including:

1. Decision: (1) or (2) chapters
2. If (2) chapters, outline of contents
3. Four- or six-year plan to generate and publish the two chapters



15. Program SC

- Program SC Chair: Ronnie Moffit
- TC 5.5 submitted two programs for this 2020 Annual – neither were accepted
 - "Fundamentals of air to air energy exchangers" for Fundamentals and Applications track
 - *Adam Fecteau Chair*
 - Black Box view of energy recovery exchanger— how its performance is characterized: Ronnie Moffitt
 - High level Overview of technology / exchanger types: Mark Tardif
 - High level overview of exhaust energy recovery control: John Bade
 - “Example of Using Exhaust Air for Energy Recovery and More”
 - Exhaust Energy Recovery combined with Evaporative cooling
 - Speakers Mike Scofield and Prakash Dhamshala
- Recommendation: resubmit for Chicago



Details of “Fundamentals...” Seminar

Description:

An air-to-air energy exchanger transfers heat, or heat and water vapor from one airstream to another. This seminar will take exhaust air energy recovery back to the basics. This overview is intended to benefit the novice user to the seasoned design engineer and everyone in between whose goal is to recover exhaust air energy.

Learning Objectives:

1. Define the key metrics to assess an air-to-air energy recovery performance.
2. Distinguish the different type of air-to-air energy recovery components.
3. Apply the correct type of air-to-air energy recovery components to the proper application.
4. Describe the different mode of operation of a typical ERV.

- **1) Black Box view of energy recovery exchanger— how its performance is characterized Ronnie Moffitt**
 - Performance terms (AHRI 1060)
 - MOT ASHRAE 84
 - Energy recovery Ratio definition
 - Recovery efficiency ratio
- **2)High level Overview of technology / exchanger types Mark Tardif**
 - Counter flow fixed exchanger
 - Cross flow fixed exchanger
 - Rotary counter flow exchanger
 - Recuperators
 - Heatpipes
- **3) High level overview of exhaust energy recovery control John Bade**
 - Cooling/heating/ no recovery modes
 - Capacity modulation at part load
 - Frost avoidance
 - Airside Economizing allowance

2021 Winter Conference - Chicago

| Track # | Track | Track Chair |
|---------|---|--|
| 1 | HVAC&R Fundamentals and Applications | Robert Cox bob.cox@jacobs.com |
| 2 | Systems and Equipment | Dr. Marianna Vallejo marianna.vallejo@jacobs.com |
| 3 | Refrigeration and Refrigerants | Gary Debes gary.debes@comcast.net |
| 4 | Environmental Health Through IEQ | Stephen Idem sidem@tntech.edu |
| 5 | Building Performance and Commissioning for Operation and Management | Lee Ribbeck lee.riback@gmail.com |
| 6 | Energy Conservation | Nivedita Jadhav nivi2307@gmail.com |
| 7 | International Design | Farhan Mehboob farhan.mehboob@smehboob.com |
| 8 | Standards, Guidelines and Codes | Kyle Inge kinge@burns-group.com |



2021 Winter Conference - Chicago

Deadlines:

Monday, June 15, 2020: Website Opens for Seminar, Workshop, Forum, Debate, and Panel Proposals

Wednesday, July 8, 2020: Final Conference Papers Due - Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment); Request for Conference Paper Sessions Due

Monday, July 27, 2020: Conference Paper Accept/Revise/Reject Notifications

Monday, August 3, 2020: Website Closes for Seminar, Workshop, Forum, Debate, and Panel Proposals

Monday, August 10, 2020: Revised Conference Papers/Final Technical Papers Due

Monday, August 24, 2020: Conference and Technical Paper Final Accept/Reject Notifications

Monday, October 5, 2020: Seminar, Workshop, Forum, Debate, and Panel Accept/Reject Notifications



Program SC: Discussion and Recommendation

- Any suggestions in lieu of resubmitting?
 - "***Fundamentals of air to air energy exchangers***"
Fundamentals and Applications track
 - "***Example of Using Exhaust Air for Energy Recovery and More***"
Systems and Equipment track? Energy Conservation track?
- Any new topic suggestions?
 - Speakers needed
 - If speakers, topic and outline are provided, Program SC Chair will schedule a meeting in early July to take action
- Development of "canned" programs for Chapter presentations
 - Volunteers?



16. Research SC

- Research SC Chair: John Dieckmann
 - John Bade
 - Saadat Khan
 - Carey Simonson
 - Kristin Sullivan
 - Marc Tardiff

Research SC: Research Project 1799-RP

- 1799-RP Validation of Extrapolation of Performance Rating Test Results for Small Energy Exchangers to Large Exchangers
 - Project Management Subcommittee: Dieckmann, Fecteau, Afshin, Xudong Wang (AHRI)
 - Contract: team of Intertek and UNCC was selected
 - The contract was finalized in April

1799-RP (continued)

- The PMS and Matthew met on May 29 to review the scope of work
- A kick-off meeting was held with the PMS and the contractor's team on June 4th. Work is underway, expect to complete Task 1 (summarizing testing and rating standards) on schedule, by the end of June
- Task 2, survey certified ratings of exchanger families with a range of nominal capacities less than 5000 CFM. Asking for help from manufacturers who can provide performance data, will be sending an email to the extended TC5.5 with this request



Research needs related to Covid-19

- Held a well attended research subcommittee meeting (all TC5.5 voting and corresponding members were invited) on June 9th to identify needs. Brainstorms:
 - How to measure/quantify transfer in the lab?
 - Is EATR a good way to quantify transfer?
 - How to simulate virus containing aerosol?
 - Laser particle counting in the exhaust and supply air streams to measure transfer
 - Effect of pressure differentials, real world PDs
 - Frosting-defrosting as a transfer mechanism
 - Condensation-reevaporation as a transfer mechanism
 - Do any desiccants have anti-viral properties?
 - ERV saving energy while actively maintaining indoor RH>40% in dry climate
 - Does rated latent effectiveness hold when sensible transfer is in the opposite direction?
- Meeting minutes are forthcoming

17. Standards SC

- Standards SC Chair: Matthew Friedlander
 - TJ Farrell
 - Adam Fecteau
 - Ronnie Moffitt
 - Carey Simonson
 - Alkis Triantafyllopoulos

Standard 84-2020 Method of Testing Air-to-Air Heat/Energy Exchangers

- Replaces the 2013 edition
- 1st meeting June 27 2016 in St. Louis
- 34th and final meeting February 4 2020 in Orlando
- Now written in mandatory standards language
- Provides a method of test for Fixed-bed Regenerators

ASHRAE Standard Project Committee 84
Cognizant TC: 5.5, Air-to-Air Energy Recovery
SPLS Liaison: Adrienne G. Thomle

Matthew Friedlander*, *Chair*
John C. Bolster*
Wongyu Choi
Terrence H. Farrell Jr.*
Adam Fecteau

Andy Kebernik*
Nicole Lantonio
Ronnie R. Moffitt*
Richie Mohan*
Mary Opalka*

James Scudamore*
Carey J. Simonson*
Christopher G. Stone*
Marc Tardiff

** Denotes members of voting status when the document was approved for publication*



Standards Recommendations (informal)

- 7.1 Consider development of a test and rating method for frosting threshold: that is the conditions at which steady-state operation of the exchanger cannot be maintained due to formation of frost.
- 7.2 Evaluate whether the Standard fully supports pumped run-around loop exchangers, determine whether additional qualification of capacity rate in the pumped fluid is needed, consider whether such exchangers can be tested as components or must instead be evaluated as systems, etc.
- 7.3 Consider development of a pressure withstand metric.
- 7.4 Consider whether the current informative annex on Field Testing can be developed to the point that it can be made normative.
- 7.5 Monitor Research Project 1780 “Test method to evaluate cross-contamination of gaseous contaminant within total energy recovery wheels” (for laboratory ventilation) to see whether this brings to light new information that might be relevant to a Standard.
- 7.6 Monitor global standards relating to ERV.
- 7.7 Recommend re-opening Standard 84 and/or developing a new Standard as appropriate.

Global Standards

- ISO 21773
 - Patterned on ASHRAE 84, method of laboratory test for exchangers (not ventilators)
 - Does not cover fixed-bed regenerators
 - Entering Final Draft International Stage
- prEN308 Heat exchangers — Test procedures for establishing performance of air to air heat recovery components
 - Intended for use in the European system of Energy Performance of Building Directive
 - Method of test for exchangers in labs, in units or in the field
 - Only partially aligned with ASHRAE 84
 - Submitted to CEN Inquiry late January 2020



18. Website



Air-to-Air Energy Recovery

ASHRAE Technical Committee 5.5

[Home](#)

[Membership](#)

[Meetings](#)

[Documents](#)

[Functions](#)

[More](#)

Agenda

TC0505 Agenda Virtual Meeting 20200618

Upcoming TC Meetings

ASHRAE ANNUAL Meeting, Austin Texas

June 27 - July 1

Because the ASHRAE Annual Meeting scheduled for Austin will not be a physical meeting, TC5.5 will meet virtually instead, on June 18, from 13:00 to 16:00 eastern time.

Meeting Link: [https://zoom.us/j/93831660519?](https://zoom.us/j/93831660519?pwd=UIZtQWJDenBJQ0xZK0k1NUpscHJkUT09)
[pwd=UIZtQWJDenBJQ0xZK0k1NUpscHJkUT09](https://zoom.us/j/93831660519?pwd=UIZtQWJDenBJQ0xZK0k1NUpscHJkUT09)

Committee Chair

Matthew Friedlander

TC0505@ashrae.net

Committee Scope

TC 5.5 is concerned with air-to-air heat exchangers, their application and cost benefit relationship. It includes consideration of the needs and procedures for standardization and testing, rating and terminology applicable to air-to-air energy recovery.

[More](#) >

Website

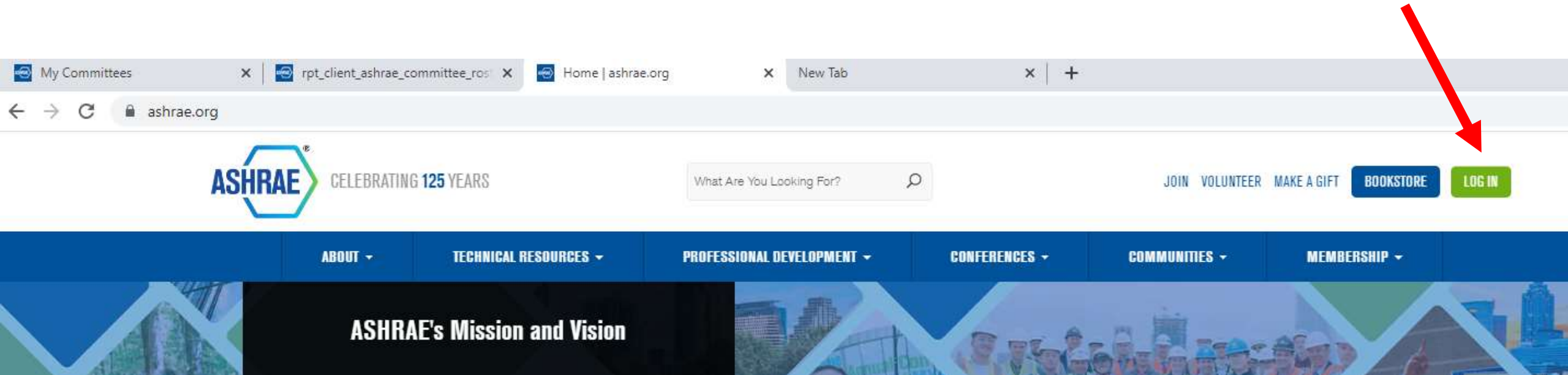
<http://tc0505.ashraetcs.org/> (Brandon Damas)



19. Membership

- (Matthew Friedlander)
Roster rollover date has been pushed back to August 1 this year.
- Current total membership: 121
- Voting members: 12, three rolling off (Friedlander, D'Arcy, Piscopo)
- New appointments will be announced later

Please maintain your membership information



Please maintain your membership information



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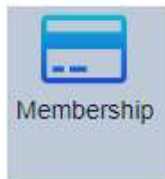
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Membership



Contact
Information



Biographical
Information



Participation

MEMBERSHIP

Membership Information

ID: 5158125
Original Election Date: 10/1/1998
Paid Thru: 11/30/2020
Member Grade: Member
Status: Active
Expiration Date: 11/30/2020

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Please check your information on the TC roster



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My Nominations

Our records indicate that you are currently not nominated on any of our committees

My Active Committees

| Committee Name | My Position | Action(pdf) | Action(xls) | Action(outlook) |
|---------------------|-------------|------------------------|------------------------|------------------------|
| T-STDS-SPC 84-2013R | Chair | Roster | Roster | Roster |
| T-TAC-TC05.05 | Chair | Roster | Roster | Roster |

All Committees

(note: use % as a wildcard for searching partial committee names)

Membership Process

Anyone can apply for membership and automatically become Provisional Corresponding Members, and are notified that:

“Provisional corresponding members serve 2 year terms. Although provisional corresponding members are not voting members, at the end of your term and based on participation in the committee, you may be considered for future voting membership.”

Appointments as Corresponding or Voting Members are made by the TC Chair.

- (16) Provisional Corresponding Members
- About (86) Corresponding Members
- (7) Staff and Liaison Positions
- We will again be asking everyone on the Roster to confirm their interest.
- Non-respondents will be purged.



20. Required Annual Review of TC5.5

ASHRAE's Technical Activities Committee requires that for each Technical Committee, the Committee Chair and Committee Membership shall evaluate their progress in accomplishing the purpose for which they were constituted and recommend one of the following action:

Continue, Merge, or Dissolve.

New Business

New business may be discussion only after a motion and second.

Next Meeting

Next face-to-face meetings will be at the 2021 Winter Meeting, January 23rd-27th, in Chicago, IL

Subcommittee and Workgroup Meetings will be virtual

