

Draft Minutes - Main Committee Meeting

TC 2.4 Particulate Contaminants/Removal Equipment

Tuesday January 21, 2014

3:30-6:00 pm

New York Hilton, Concourse Level, Concourse B

1. TC Chair Tom Justice called the meeting to order at 3:35 pm.
2. Attendees introduced themselves and sign-up sheets were distributed. About 50 people were in attendance including 21 Corresponding Members and 15 guests. There were no ASHRAE Liaisons present.
3. Secretary Gemma Kerr made the roll call of Voting Members. Thirteen of eighteen VM were present at this point, and one more joined during the Subcommittee reports. Quorum for this committee is ten VM. VM attendance and Non-Voting Member responsibilities are shown below.

Voting Member	Pres	Abs	Voting Member	Pres	Abs
Tom Justice (Chair)	X		Gemma Kerr (Secretary)	X	
Nader Barjesteh		X	Kathleen Owen	X	
Eric Brodsky (Handbook)	X		Mark Renn		X
Monroe Britt		X	Jeff Siegel (Non-Quorum)	X	
Bob Burkhead	X		Christine Sun	X	
Chris Campion		X	Paolo Tronville	X	
Mike Corbat (Standards)	X		Al Veeck (Membership and Webmaster)	X	
Zied Driss	X		Mike Waring (Research)	X	
Randy Haseman	X				
Tim Johnson	X				
			Totals	14	4
					18

NV Officers

Thornburg (Vice Chair)

Marilyn Listvan (Program and Publications Chair)

Barney Burroughs (ALI Coordinator)

Ken Snider (Alt #1 MTG.EEC)

4. Tom Justice welcomed everyone to the meeting and delivered his opening comments.
 - a. He started with a review of the meeting Agenda. It was accepted with minor corrections;
 - b. The TC Chairs Workshop revealed that ASHRAE will host web conferences/ conference calls for TC Subcommittees to allow live discussions between Meetings. Requests should be sent to Mike Vaughn;
 - c. ASHRAE has added an Employment Discipline box to their Bio form. Tom asked everyone to check their Bio and fill out the new box;

- d. The TC Roster is available for view on the ASHRAE website under www.ashrae.org/MyActiveCommittees;
 - e. The TC Master Calendar is now available through GOOGLE;
 - f. The E & P Beta Test #5 TC meetings are being held in New York;
 - g. ASHRAE is offering an Outstanding TC Award. We should try to place ourselves in the running to win;
 - h. On September 24, 2013, an e-mail from Denise Latham requested limited review of the Environmental Protection Agency (EPA) document *Energy Savings Plus Health Guide for Schools: IAQ Guidelines for School Buildings*. Comments were sent back October 28, 2013;
 - i. A survey request from Mike Vaughn regarding Young Engineers of ASHRAE (YEA) was sent in early December 2013. It was completed January 15, 2014;
 - j. Ken Cooper (ASHRAE) requested a TC 2.4 slogan for his presentation to YEA members to encourage activity. A small competition was held in November and the winner was "Breathe Easy, Filter the Indoor Air";
 - k. Attendees were asked to read and abide by the ASHRAE Code of Ethics. It was displayed on screen, and a copy can be found in Attachment 1.
5. Scott Sherwood announced that the Particle Party would take place at the Old Castle Pub & Restaurant, 160 W. 54TH Street, 2nd Floor, starting at 6 pm. The total number interested was around 30, including people from TC 2.3.
6. A motion to approve the Denver Minutes as distributed was made by Marilyn Listvan and seconded by Mike Corbat. The Minutes were approved by a vote of 10-0-2-5-18 (Yes-No-Abstain-Absent-Total), Chair Not Voting (CNV).
7. Gemma Kerr read out the record of business conducted since the Denver Meeting. This included items 4h, 4i, 4j, and one vote as shown below:
- a. Approval to forward Unsolicited Research Proposal 1691 to RAC was obtained in a letter ballot ending September 6, 2013. The vote was 13-0-1-3-18 (CNV). Two people voted YES with comments.
8. Subcommittee Reports
- a. Planning Subcommittee Report.....Don Thornburg
 - i. The Planning Sub-Committee met 8-10 am Monday and 21 people participated. The Meeting Minutes are shown in Attachment #2;
 - ii. This Sub-Committee does not deal with reports of what has been done, but rather with how things are being done and how we can do better;
 - iii. There was a useful free-for-all discussion at the meeting. A strong theme was getting more people involved and participating in the work of the TC, particularly young people
 - iv. There was discussion on where does the filtration industry want to be in 50 years time. Al Veeck asked whether the five-year plan that the TC prepared for ASHRAE several years ago was relevant to this, but Past Chair Jim Hanley said that it was not helpful;
 - v. Don summarized some of the issues raised at the meeting by the Sub-committee Chairs;
 - vi. Al Veeck proposed and Zied Driss seconded the motion to approve the Planning Subcommittee Report. The motion was carried by a vote of 12-0-1-4-18 (CNV).
 - b. Membership Subcommittee Report.....Al Veeck
 - i. Regarding current voting membership of the TC, Nader Barjesteh, Chris Campion, and Mark Renn have resigned, and Monroe Britt and Bob Burkhead will roll off after the June Meeting;

- ii. Five new VM will be appointed to keep the total number at 18. These will be selected from CM based on their useful contributions to Sub-committees;
 - iii. Note that it is not necessary to be either VM or CM if you want to be involved in Sub-committee activities, however being a Member makes communications easier;
 - iv. If you wish to become a CM, contact Al Veeck after the Meeting;
 - v. Kathleen Owen proposed and Tim Johnson seconded the motion to approve the Membership Subcommittee Report. The motion was carried by a vote of 12-0-1-4-18 (CNV).
- c. Research Subcommittee Report..... Michael Waring
- i. The Research Subcommittee met 3-5 pm Sunday with 51 people attending including Research Activities Committee (RAC) Liaison Harvey Sachs. His function is to help the TC get their submissions accepted by RAC;
 - ii. The Meeting Minutes are shown in Attachment #3;
 - iii. News from RAC indicated that ASHRAE's Research program currently includes 62 active projects with a total value of \$10.8. In New York, RAC released 11 Requests for Proposal (RFP), and evaluated several submitted Research Topic Acceptance Requests (RTARs), Unsolicited Research Proposals (URPs), and Grant-in-Aid requests;
 - iv. TC 2.4's Work Statement 1649 on residential filters was returned by RAC for revision, it needs more milestones and specific deliverables;
 - v. 1691-URP on modeling the effects of particles has been submitted to RAC. URPs are now accepted as a viable alternative to internally-generated WS;
 - vi. TC 2.4's 1626 RTAR on energy implications may need a new champion now that Phil Winters is no longer active on the TC;
 - vii. Requests have been submitted for co-sponsorship of two incomplete RTARs. Chair Tom Justice said that the TC will not co-sponsor until these have been completed and approved by vote of the originating committee. However, he would allow a vote to support their development. For round robin testing to validate revised Standard 52.2 procedure, the motion to support was proposed by Mike Waring, seconded by Tim Johnson and passed by a vote of 13-0-0-4-18 (CNV). For development of a better load aerosol for capacity testing, the motion to support was proposed by Mike Waring, seconded by Christine Sun and passed by a vote of 13-0-0-4-18 (CNV). TC 2.4 will need to take the lead on this one because the originator is Guideline Project Committee 35, and GPCs are not allowed to sponsor research projects;
 - viii. A number of other ideas for RTARs were discussed at the meeting;
 - ix. Criticism of RAC had been expressed due to inconsistency of comments sent with rejected RTARs (reviewers are often different each time they are submitted). Several people at the TC meeting endorsed the criticism, and Harvey Sachs said he would follow up with RAC on this.
 - x. Bob Burkhead proposed and Zied Driss seconded the motion to approve the Research Subcommittee Report. The motion was carried by a vote of 12-0-1-4-18 (CNV).
- d. Standards Subcommittee Report.....Michael Corbat
- i. The Standards Sub-committee meeting took place Monday 4:15– 6 pm and was attended by 36 people. The Meeting Minutes are shown in Attachment #4;
 - ii. The Sub-committee is cutting down on the number of standards discussed;
 - iii. Standard 62.1 is looking for white papers on airborne contaminants;
 - iv. Standard 52.2 has 4 Addenda in various stages of Public Review, and is proposing to take Appendix J into the body of the Standard;
 - v. GPC 35 had 9 members present at its first meeting, and may change its meeting time;
 - vi. International Standards Organization (ISO) Standard 29462 on in-situ testing of particle filters was published September 2013. It is technically and procedurally identical to ASHRAE GPC

26, and ASHRAE has decided to adopt the ISO document. ASHRAE has asked TC 2.4, the parent committee of this Guideline, to vote to withdraw GPC 26. The motion recommending withdrawal of GPC 26 and its replacement with ISO 29462 was proposed by Mike Corbat, seconded by Tim Johnson, and carried by a vote of 10-1-1-5-18 (CNV). Al Veeck voted against the motion on the grounds that the ISO process is likely to be a lot slower than ASHRAE, and that if changes are made to the document in future, the USA would lose control of the document's contents. While ASHRAE will lose sales revenue with discontinuation of GPC 26, it should be noted that it supports the concept of international standards, and also holds the Secretariat for ISO TC 142 which produced Standard 29462;

- vii. A motion to approve the Standards Subcommittee Report was proposed by Al Veeck, seconded by Christine Sun and carried by a vote of 12-0-1-4-18 (CNV).

e. Program Subcommittee Report.....Marilyn Listvan

- i. The Program Subcommittee met on Monday from 10-11 am and was attended by 21 people. The Meeting Minutes are shown in Attachment #5;
- ii. After having no program items accepted for the last two meetings, the TC obtained 2 seminars for New York. In addition, Kathleen Owen presented a conference paper and a poster, and Jeff Siegel's seminar on Life Cycle Costs was not credited to TC 2.4;
- iii. K.J. Choi's seminar "Real Co\$t of Filtration" was accepted at the fifth submission. Marilyn recognized K.J. with a fun award for his persistence;
- iv. Matt Middlebrooks complimented Zied Driss on his seminar "A Comprehensive Look at Infectious Disease and Air Filtration in Health Care Facilities: Energy Saving, IAQ Performance and What Makes You Sick". Zied thanked his speakers for their contributions;
- v. The success rate with Forum submissions is now almost non-existent. The acceptable format now is a Workshop, which is a cross between a Forum and a Seminar. The Moderator needs to supply a learning objective, and a minimum of 2 speakers (each to provide an Abstract);
- vi. Seattle will have an Indoor Environmental Quality track with Tom Kuehn as Chair. There is also a Standards track where the TC might submit;
- vii. Three Workshops were proposed for Seattle, and other program items for later meetings were discussed;
- viii. Al Veeck proposed and Paolo Tronville seconded the motion to approve the Program Subcommittee Report. The motion was carried by a vote of 12-0-0-5-18 (CNV).

f. Web Master ReportAl Veeck

- i. Al is trying to organize email notification of TC members when new posts are made on the website;
- ii. Al asked for suggestions on how to improve the website;
- iii. LinkedIn links to ASHRAE, T 2.4, and ISO have been made, and links to the TC 2.3 page will be added;
- iv. A motion to approve the Web Master Report was proposed by Mike Corbat, seconded by Zied Driss and carried by a vote of 12-0-0-5-18 (CNV).

g. Handbook Sub-committee ReportEric Brodsky

- i. The Handbook Sub-committee meeting took place Saturday 1-2:30 pm and was attended by 17 people, in spite of having to be moved because the designated room was being used to store tuxedos;
- ii. The Meeting Minutes are shown in Attachment #6;
- iii. Chapter 29, "Air Cleaners for Particulate Contaminants", in the HVAC Systems and Equipment Handbook will be re-published in 2016. The Sub-committee has volunteers working on various changes and expects to complete the revision by the Chicago Meeting in 2015.

- iv. Al Veeck proposed and Tim Johnson seconded the motion to approve the Handbook Subcommittee Report. The motion was carried by a vote of 11-0-2-4-18 (CNV).
- h. Publications ReportMarilyn Listvan
- i. Publications used to have a joint TC 2.3/2.4 meeting 3-4 pm on Monday. Marilyn recommended that we reactivate the room request but use the time slot to run Forums. TC 2.3 would like to use the slot in Seattle, and TC 2.4 would get it in Chicago;
 - ii. ASHRAE has set up a Terminology Wiki, but it is not clear how it will be managed and improved;
 - iii. Marilyn recommended that TC 2.4 add a bibliography of member publications to its website. Please send details to her;
 - iv. Attendees were encouraged to contribute articles to ASHRAE Journal (a paper is 3000 words,) or to Insights (a column is about 2000, and a research impact statement 700-1500 words);
 - v. The IAQ Conference Proceedings CD is still in preparation;
 - vi. Barney Burroughs recommended the Indoor Air Quality Guide to attendees, stating that it is one of ASHRAE's finest documents. It is also FREE;
 - vii. Marilyn asked if anyone was interested in taking over Publications from her, noting that it is not necessary to be an VM to do this. Grace Byfield volunteered.
 - viii. Paolo Tronville proposed and Eric Brodsky seconded the motion to approve the Publications Report. The motion was carried by a vote of 13-0-0-4-18 (CNV).
9. There were no reports from other TC liaisons.
10. No items of Old Business were raised.
11. New Business
- a. Eco Care Corp announced that they would be sponsoring food at the Particle Party, and received a round of applause for their generosity;
 - b. Al Veeck announced that in September 2013 the National Air Filtration Association had given a Lifetime Achievement Award to Jim Hanley. Everyone applauded, and Jim thanked his colleagues at Research Triangle Institute for their support;
 - c. Kathleen Owen announced that she had become a grandmother 15 minutes previously;
 - d. Tom Justice noted his appreciation for the help given by ASHRAE's Judy Marshall in arranging a suitable room for the TC meeting;
 - e. Tom Justice presented Mike Waring with a small gift for authoring the winning YEA slogan
12. The motion to adjourn was proposed by Al Veeck, seconded by Marilyn Listvan and carried unanimously. The Meeting was adjourned at 5:40 pm.

ATTACHMENT #1

ASHRAE Code Of Ethics (Approved by ASHRAE Board of Directors January 30, 2013)

1.140.001.1 As members of ASHRAE or participants in ASHRAE committees, 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.
- E. We shall avoid real or perceived conflicts of interest whenever possible, and disclose them to affected parties when they do exist.
- F. The confidentiality of business affairs, proprietary information, intellectual property, procedures, and restricted Society discussions and materials shall be respected.
- G. Each member is expected and encouraged to be committed to the code of ethics of his or her own professional or trade association in their nation and area of work.
- H. Activities crossing national and cultural boundaries shall respect the ethical codes of the seat of the principal activity.

ATTACHMENT #2

TC 2.4 Planning Subcommittee Meeting – New York Minutes

Monday, January 20, 2014

8:00 – 10:00 a.m.

Hilton Concourse B

The HOW and WHY meeting for TC 2.4

1. Call to order, Welcome and Introductions

a. 21 attendees present

2. Review draft agenda

a. No issues

3. Scope for the Planning Committee

Evaluate and propose methods for improving the operations of TC 2.4 and its subcommittees (herein referred to as committees). This would include recommendations to the committees on "How" and "Why" we are operating as committees, ways to improve participation in TC 2.4 activities, and future activities and direction of the committees. The focus of the planning committee is not intended to be "What" we have done in the committees.

4. Committee discussions

a. TC 2.4 Main – Tom Justice

i. We are seeing new folks starting working and being active in the work of TC 2.4. We want to see this continue.

b. Planning – Don Thornburg

i. The new format seems to be working.

c. Handbook – Eric Brodsky

i. There is a chapter in the Systems volume that references filtration and we need to get input into that chapter.

ii. ACTION: Eric to confirm the details on this and Tom to draft a letter to the TC responsible volunteering TC 2.4 to help fix the issue(s).

d. Program – Marilyn Listvan

i. We have 2 programs on the schedule and neither in the final Wednesday slots.

ii. The cost to attend the Program is prohibitive to attend.

iii. ACTION: Tom to talk to ASHRAE about what can we do to help. Can ASHRAE implement a "Pay-Per-View" cost structure i.e. pay for individual session?

e. Publications – Marilyn Listvan

i. We need Journal or Insights articles and authors.

ii. Can we develop a Smart Phone App on filtration?

iii. ASHRAE has TC 1.5 which has a subcommittee on App development.

1. ACTION: We need someone to attend and see what we need to do to get ASHRAE to fund/sell an app? Marilyn to coordinate.

iv. Can we put together a program to get kids involved in buildings, HVAC, Filtration etc?

1. Regional speakers with a set TC 2.4 presentation to deliver to schools.

2. Focus on environmental impact, how to make a difference and not from an old person point of view, but a young person's point of view

f. Research – Michael Waring

i. We need more diverse involvement. A small number of people are authoring the RTAR's and WS's and we need that to be spread out.

ii. Look at using Google Docs (or similar system) to speed up the review and editing process

iii. ACTION: Michael to look into what would be a workable system to speed up this process

g. Standards – Mike Corbat

i. Thinning the herd. We will continue to eliminate the standards we are not getting updates on and this opens the door for new items.

h. Website – Al Veeck

i. ACTION: All subcommittee chairs are asked to send their draft agendas to the webmaster a minimum of 30 days in advance of the meetings.

i. Membership – Al Veeck

i. Always looking for active people to join. Active does not mean showing up, it requires raising your hand...

5. New Business

a. Where will TC2.4 go in the future (advanced filter methods, new particles or sizes in the air handler or occupied space, how to address particles and future health concerns, advancement in technology that will impact filtration...)? Should we be putting together a future plan as business and government does?

6. Adjourn

7. Other ideas from Brian Krafthefer (email after)

a. What filtration will be needed to handle a 'changed climate' (more dust, hotter, more humid, more biological growth in systems and on filters,...)? Since the climate may change, how can TC2.4 be best positioned to meet the changing filtration needs?

b. We mentioned apps, should the TC start thinking what apps might be best to start with?

c. If ASHRAE were to put a kid's link on their web page, what could TC2.4 contribute (filter games, how to make greener spaces with filters...) that would stimulate interest in the kids to go into engineering?

8. ASHRAE PEAC presentation

a. A gentleman from ASHRAE gave me a presentation just before we started the meeting with no explanation and I forgot about it during the meeting. After reviewing it (after we had adjourned), I realized it is from the President Elect Advisory Committee of ASHRAE and it should go to all of TC 2.4 and as such, is attached for your review. **Note from Secretary: the presentation is attached in a separate file.**

ATTACHMENT #3

ASHRAE RESEARCH SUBCOMMITTEE MEETING MINUTES
New York, NY
TC2.4 – Particulate Air Contaminants/Removal Equipment

Sunday, January 19, 2014
3:00 – 5:00 PM
Location: Riverside Suite (S3)

1. Call to Order (*Meeting began at 3 PM.*)
2. Introductions (*Introductions were given; 51 people signed the sign-in sheet.*)
3. Review of Agenda (*Chair quickly reviewed the agenda.*)
4. Chair's Comments (*No comments; RAC liaison was present and introduced himself at this time.*)
5. Work Statement activity in RAC between meetings
 - a. 1649-WS Impact of Higher Efficiency Filtration on IAQ in Residential Environments with Central HVAC – Champion: Tom Justice (*Submitted 5/15, Returned with comments – Progress with Rewrite?*)

Tom Justice is still working on the rewrite and has had a couple of conference calls since last section; hopes to meet with authors this meeting if he can get them together (need to break work into milestones*)

***Remember this fact for all future WSs**

6. Unsolicited Research Proposal
 - a. 1691-URP Modeling the impact of residential HVAC filtration on indoor particles of outdoor origin. (*PES voted to send to RAC for consideration*)
Submitted and to be considered by RAC on Wednesday.
Future URP processes: Still encourage them but start with a 1-2 page extended abstract and explain why it needs to go through URP route instead of RTAR/WS. No real objection to Chair's proposed URP submission process.
7. Current Tentative Research Projects (TRP)
 - a. TC 2.1 – 1624-TRP Effective Energy Efficient School Classroom Ventilation (*Bid for proposals ended Dec. 16, 2013*)
Bid period just ended, and RAC considering this meeting.

8. Cosponsored Projects (for reference only)

- a. RP-1603 Role of HVAC Systems in the Transmission of Agents in Buildings and Intermodal Transportation (TC2.4 co-sponsor with TC9.6 and EHC. TC 9.3 main committee) (*This is a current research project w/ Shelley Miller from CU Boulder*)

Paolo and Bob Baker is part of the PMS/PMC, and project started last summer and has produced the literature review, which the PMC will vote on acceptance. Unsure about how they will progress with field measurements.

9. Work time on any RTAR, WS and other proposals for remainder of the meeting time

- a. 1649-WS Impact of Higher Efficiency Filtration on IAQ in Residential Environments with Central HVAC – Champion: Tom Justice (*Submitted 5/15, Returned with comments*)

Already discussed this in item 5 above.

- b. 1626-RTAR Energy Implications of Air Filtration in Commercial Buildings (*Phil Winters was RTAR champion. No progress made. Can we resubmit older one soon?*)

Returned twice in the past: once for insufficient detail and once for too much detail. Chair will email Phil Winters and ask if he wished to relinquish championing this Jeff Siegel, Brent Stephens, Michael Waring to co-champion. Brent possible lead.

- c. Impact on performance (efficiency and pressure drop) of air filters in high humidity and free moisture conditions. Champions: Dave Matier and Christine Stanfel (*Previously stated would work on RTAR with no firm commitment date. At last meeting there was general consensus this would be lab testing, though a few people saw merit in field testing. Kathleen Owens said she would help work on the RTAR but will not champion it.*)

Original authors cannot move this forward anytime soon. Bob Burkhead is the new champion for writing the RTAR.

Barney Burroughs says GPC 10 (“IAQ interactions”) is looking for ways to work together. Barney will provide a few names to Bob.

- d. Discussion of new RTAR ideas

- i.) Ageing procedures and materials suitable for assessing the energy performance of air filters (*Paolo Tronville will speak to this.*)

Related to GPC 35, new GPC meeting for the first time on Tuesday morning. The first step is to develop a way to reproduce an aerosol that can mimic urban aerosol (moving away from test dust). GPC aims to create a method of test for estimating energy consumption for air filters (perhaps combustion sources as soot generators). They meet 8 to 10 Tuesday morning, and are looking for co- sponsorship or lead- sponsorship and technical help. This RTAR could come out of GPC 35 or SSPC 52.2 or TC 2.4. Those offering help: Brent Stephens, Michael Waring, Dave Matier, Laura Kiefer.

ii.) Effectiveness vs. costs of operating room air cleaners and central HVAC filtration for controlling particulate matter in residences (*RTAR authored by Brent Stephens. Brent Stephens will introduce this RTAR for discussion.*)

This was Tom's idea originally, and Brent Stephens authored an RTAR, which was sent out before the meeting and we discussed, as follows:

Barney Burroughs: "portable air cleaners don't work" 1) Are we taking into account official CADR? 2) Discharge mode questions (re-entrainment issues?). 3) Where in the cycle of life is the unit (residential maintenance practices)?

#1 and #2 are largely able to be answered with a good project.

Vijay says we offer too much detail on the experimental plan:

Jeff Siegel says RAC will kick it back if you do that.

Vijay: Remove "CONTAM" and things like that. More detail on what we want. Less detail on how to get there.

Jim Hanley: Should this deal with airflow modeling (CFD)? If so, we should bring in 4.10, but some are less inclined to do this.

Jeff Siegel concerned about CONTAM modeling: found different results of CFD versus CONTAM in his 2009 study. But there are also issues w/ CFD.

Concerns were raised about how to compare central to portable because they target different objectives (i.e., room versus whole-house concentrations)

Bruce McDonald: Is part of the research objective to figure out how to compare these two systems?

Jeff Siegel thinks we can do a better job of providing metrics for comparison. Path forward: Submit a revision to Michael Waring and add a new section

describing metric evaluation. Michael will edit and send back out for vote w/ letter

ballot. Deadline one week for revision so we can get it out well before March 15th RAC deadline.

*iii) Are conventional filtration designs compatible with VRF (mini-splits) systems?
(Champions: Jeff Siegel, Brent Stephens, and Michael Waring agreed to form a group to brainstorm research objectives.)*

Fits into the idea of distributed versus central cleaning. Fold into Brent's RTAR. Seems more like a product development issue.

iv) Filtration of viruses for different MERV classified filters (Champion: Al Vatine)

Al Vatine was not present at this time.

v) Filtration efficiency for PM2.5 in indoor environments

What is the removal efficiency of various MERV filters for PM2.5 in most indoor environments? Potential modeling, lab, or field work. Is this more 52.2 or in line with this TC?

Bruce McDonald has done similar work; this would be an extension. No clear plan forward.

vi) Survey of residential HVAC filter ownership

Who buys what kinds of filters, particularly in residences? TC 2.4 could sponsor some sort of market report every 5 years or so on trends in residential filtration. This could be a survey of homeowners or stores that sell filters to the masses.

Jeff: RAC hates surveys. Market data issues.

Barney: Should come from AHRI or similar. Disregarded.

vii) Particle filtration for residential mechanical ventilation systems

There's a lot of discussion about supply versus exhaust ventilation strategies in homes and what to recommend for IAQ. Exhaust ventilation can provide higher AERs but pulls pollutants and other things through the building envelope. This might actually help for particles, but may be bad for gases if insulation and other enclosure materials are sources. Supply ventilation systems typically use very poor particle filters, so their impact on indoor concentrations of outdoor particles may actually lead to an increase. Perhaps a review of filtration for residential mechanical ventilation systems with measurements in buildings?

Discussion: Exhaust only is an issue that should just be avoided anyway, particularly in the southeast. Some interest in general interaction between filtration and mechanical ventilation. Jeff Siegel said lots of retail buildings were operating at negative pressures in the retail project. No clear plan forward.

viii) Particle filtration by building envelopes

How well do building envelopes actually filter particles? What's the MERV of a building envelope? More info and study on size-resolved "filtration efficiencies" of building envelopes?

Brent Stephens will champion. Maybe seek 4.3 infiltration co-sponsorship.

ix) From 52.2 meeting

a) RTAR on Round Robin with current 52.2 (after addendum changes) Keith or Gemma will be talking to you about co-sponsorship when the draft is finished

Michael Waring will bring up at main TC 2.4 the idea of cosponsorship. Bruce McDonald: can we have somebody do an audit of each of the labs that submit data?

There is no document for this yet. This is a preliminary support vote.

b) RTAR – dust loading for Energy Efficiency – ASHRAE dust not good for estimating energy use, so looking into different dust. Since this is energy related (thus not in scope for 52.2) should come out of 2.4 research.

Similar to Paolo Tronville's RTAR above.

c) MERV levels used in health care. MERV 15 vs. HEPA, dP problems with high dP on HEPAs. How does MERV 14, 15, and HEPA affect air change rates. If we

use higher air exchange rates giving more filtration, would we be better off than using HEPAs? What is influence on health effects and energy use?

The idea is that tripling pressure drop and doubling size of filtration bank may be overkill when you could just increase recirculation rates and achieve same benefit.

Seems like it would fit better in 2.4 than 52.2, and also perhaps co-sponsorship with the healthcare TC.

Barney Burroughs: would like to take health effects out.

Measurement vs. modeling? Can't do it in the field. Phil Maybee has some field experience. Seal capability of HEPA housing versus seal capability of MERV housing. Question: is modeling really sufficient to accurately capture all of these interactions?

ASSIGNMENTS: Phil will "take a look at the RTAR." Zied Driss too.

10. Liaison Report (Harvey Sachs, RAC: He is eager to turn around the perception that RAC is there to prevent research from getting funded. Q: New RTAR form? Harvey thinks the new one is online, and it is, and is now a new PDF form; email Harvey if anyone has tech support issues on that and he'll forward it to those that can help.)

11. Adjournment (*Meeting was adjourned at 4:59 PM.*)

ATTACHMENT #4

MEETING MINUTE TC 2.4 STANDARDS SUBCOMMITTEE

Monday, 20 January 2014

Hilton Concourse Level, Concourse B

New York City, NY

4:15 p.m. – 6:00 p.m.

Introductions

Chair's comments

Review proposed agenda

1) Update on standards and MTGs within scope of TC 2.4:

- a) **SSPC 52.2 M.o.T. Air Cleaners for Particle Size Efficiency** – Bob Burkhead.
 - i) 4 addenda cooking. 3 out for public review and returned. 2 with negative comments.
 - ii) Tabled discussion on bringing App. J into the standard. Will be a hot topic for Seattle.
 - iii) 52.2 research subcommittee is born. 1st meeting in Seattle. Keith Chesson will chair.
- b) **GPC 35 (Replaces-MTG Energy Efficiency Classification of General Ventilation Air-Cleaning Devices)** – Christine Sun
 - i) Geoff Crosby will try to be responsible for update. 1st formal meeting is 1/21 from 8-10. 9 members, discussion of test aerosol. Title purpose and scope.

2) ASHRAE Liaisons:

- a) **TC 2.3 – Gaseous Filtration** – Kathleen Owen
 - i) Kathleen gave update. UV-PCO – 2 research projects came in.
 - ii) **SSPC 145.1, 2, Test Methods for Assessing Performance of Gas Phase Air Clean. Equip**
 - (1) Paula is finishing cleanup of draft and sending out for public review. Entertaining changes for 145.2
- b) **TC 2.9 – UV Air & Surface Treatment** – Matt Middlebrooks
 - (1) Discussing what to do next. Talking about RTAR – round robin on 185.1
 - ii) **SPC 185.1P Elimination of Microbial Contaminants in Air**
 - (1) Both ready to go out for final review. Hope for publishing soon.
 - iii) **185.2 Elimination of Microbial Contaminants on surface**
 - (1) Both ready to go out for final review. Hope for publishing soon.
- c) **TC 5.4 – Industrial Air Cleaning** – Bruce McDonald
 - i) Musical chairs on chairmanship – seems to be settled now.
 - ii) **SPC 199 – MOT for Rating the Performance of Industrial Pulse Cleaned Dust Collectors**
 - (1) Internet meetings scheduled every other week. Meet for a week in April – will finish!
- d) **TC 9.6 – Health Care Facilities** – Zied Driss
 - i) No update. Still attending.
- e) **SSPC 62.1 – Commercial Ventilation** – Charlie Seyffer
 - i) IAQP – stuck on generation rates. Seeking anybody aware of generation rates of specific types of gaseous contaminants – white papers etc? PM1 and PM2.5 fit into formulas better...
 - ii) Workshop in Seattle on PM2.5 efficiencies?
- f) **SSPC 62.2 – Residential Ventilation** – Brent Stephens
 - i) Bruce and Brent attended. Long-term planning, no major updates.
- g) **SSPC 90.1 Energy Eff. Design of New Bldg** – Christine Sun
 - i) No update.
- h) **SSPC 90.2 Energy Eff. Design of New Low Rise Res. Bldg** –
 - i) No update.
- i) **SSPC 161 – Air Quality in Commercial Aircraft** – D. Matier
 - i) Argued vociferously about putting an addendum for training airline staff for discerning different odors. Nothing accomplished, fight between Boeing, Airbus, etc. Looking for filter sensors.
- j) **SSPC 170 – Ventilation of Healthcare Facilities** – Zied Driss

- i) **Zied will not attend meeting due to conflict. Looking for interested parties in attending?**
 - k) **SPC 180 – Inspection & Maintenance of HVAC Systems – Phil Maybe**
 - i) **No update.**
 - l) **SPC 189.1 ASHRAE/USGBC/IESNA Standard for the Design of High-Performance Green**
 - i) **Section on Housing performance – all air goes through filters. 4-5 online meetings. Their specific IAQ procedure is online and ready for use**
 - m) **Buildings except Low-Rise Residential Buildings (?inclusion of IAQ) – Charlie Seyffer**
 - i) **Recommended using SPC 189.1 IAQ procedure over ASHRAE**
 - n) **SPC 189.2 Design, Construction and Operation of High-Performance Green Healthcare Facilities (?inclusion of IAQ) –**
 - i) **No update**
 - o) **US TAG for ISO TC142 – Don Thornburg**
 - i) **Several items coming up for vote**
 - (1) **Gas phase document – 121-1, media for gas-phase. Response due 2/5**
 - (2) **All 4 parts of 16890 coming out in different stages**
 - (3) **15987**
 - ii) **WG3, 5, 7 meeting in Milan Italy**
 - iii) **Plenary in September**
 - ~~p) **GPC 23 Guideline for the Design/Application of HVAC Equip. for Rail Passenger Vehicles –**~~
 - i) **Nobody on GPC 23? Do we need to get somebody into? Removing from list.**
 - ii) **Reinstating per Tom Justice – he'll see if someone can attend**
 - q) **Environmental Health Committee**
 - i) **Barney suggested addition to list.**
- 3) **Old Business**
- a) **Report of Working Group Regarding: Proposal for new standard regarding residential filter test method – Tom Justice, Chair**
 - i) **Holding off until - WS1649 + other one**
- 4) **New Business**
- a) **Similar but conflicting standards. Call for feeling on this?**
 - i) **Bruce – replace US standards with ISO standards (“...go see xxx)**
 - ii) **Guideline 26 and ISO 29462**
 - iii) **Don - ASHRAE gave ISO GPC26 as the basis. ASHRAE agreed to sunset.**
 - (1) **Doug Tucker has left ASHRAE – this was his idea**
 - iv) **Decision has to come from TC 2.4 –**
 - v) **2.4 will vote to sunset Guideline 26.**
 - b) **MTG-EEC**
 - i) **Have to go through TC 2.4 to discontinue?**
 - c) **TC 9.11**
 - d) **Michael Corbat can add anyone for 2.4 standards correspondence**
 - e) **Check online for draft agenda (NAFA website).**

5) Information Exchange:

- a) AFS – KJ Choi
 - i) March 25-26 in Houston, TX. Oil and Gas and Chemical Processing Filtration and Sep Conference
- b) CEN/TC 195 – Air Filters for General Air Cleaning – Paolo Tronville
Reviewing ISO documents as they arise.
 - i) Stopped working besides cleanup on EN1822
 - ii) 29462 is published
 - iii) 29461-1
 - iv) EN1822 will be scared by the fact of changing the standard
 - v) Working Group 6
 - (1) Developing TM for assessing perf. of flat sheets media against nanoparticles -20nm 500nm
 - (2) Preparing scientific comments
 - (3) Full project must be finished by end of 2018.
 - (a) Dr. Pui
 - vi) Meeting in March in Zurich
- c) Eurovent – Paolo Tronville
 - i) Meets fairly often. How to change energy classif. System? Energy Rating Recommendation. Almost every filter is class A – need to make space for new products (class A+?). Forces re-definition of boundaries. Produce new version
 - ii) Was sued or stopped, not allowed to use symbol of energy rating, misleading to consumers. Have to modify the energy rating symbol.
- d) IEST – Institute of Environmental Sciences and Technology – Vijay
 - i) Vijay not here. No update on IEST
- e) INDA – International Nonwovens Development Association –
 - i) INDA will be sponsoring Filtration 2014 in Baltimore, MD in November 18-20th
 - ii) Nonwovens courses
 - iii)
- f) ISO TC 142 – Cleaning Equipment for Air and Other Gases – P. Tronville
 - i) Meeting in Atlanta, September – worked out very well, good organization from ASHRAE
 - ii) Form new WG12 – sustainability of air cleaning equipment – chair from Germany
 - (1) WG3 was overwhelmed with too many items
 - iii) WG5 new convenor – Chris Fisher
 - iv) WG2 new convenor from China (UV lamps)
 - v) WG9 reactivated – Bruce took the lead... co-leadership with Chris
 - vi) Effectiveness of so many different work items – ratio of WGs to work items is OK
 - vii) WG6 can move ahead –looking forward to appointing new WG6 convenor. US is getting a name
 - viii) Paolo is nominated for another term as chairman
- g) CEN TC 144 – Environmental Air quality for Agricultural Cabs – P. Tronville
 - i) Deleting. “Wasting their time”
- h) NAFA – A. Veeck
 - i) TECH conference, April 2-4 in Orlando, FL.
 - ii) CAFS certification available
- i) SAE Air Cleaner Test Code Standards Comm. – B. McDonald
 - i) SAE will do all of their stds work through ISO
- j) ISO TC 22/SC 7/WG 3 & WG 11 – Paolo Tronville or Bruce McDonald.
 - i) WG3 has responsibility to test dust. Changed test dust to test “aerosol”. ISO XXXXX
 - ii) Instrumentation changing – brand and model is specified for 1st time.
 - (1) New version Arizona dust.
 - (a) Part 3 soot
 - (b) Submicron salt aerosol
 - (c) Loading air filters for submicron
 - (d) “Road vehicles”

- (e) Test dusts / Test aerosols: Title of 12103 series change "Test dusts..." to "Test Aerosol..."
121003-1 *Arizona test dust*. Is moving through ISO process. Will change reference instrument from Coulter counter to Microtrac S3500. Results in slightly different numbers in specification. Specification is tightened a bit.
12103-3 *Soot*. Is New Work Item.
12103-4 *Submicron Salt* is a proposed New Work Item.
New Work Item proposed for test method for loading air filters with submicron aerosol.

- k) UL 900 – R. Haseman
 - i) **UL Canada voted to keep Class 1 and Class 2 (different from USA)**
- l) IAQ Meetings – J. Siegel
 - i) **No update**
- m) REHVA HVAC air filtration guidebook – Paolo Tronville
 - i) **Paolo was among the authors. Published 3 yrs ago. Can be removed from agenda**

6) Adjourn – 6:00 pm

Attendees

Dan Haas	Matt Middlebrooks	Laura Kiefer
Dan Newkirk	Grace Byfield	Tom Justice
Joel Davis	Michael Sexsmith	Donna Sullivan
Bruce Duffy	Keith Chesson	Jan Fretthold
Len Duello	Sanjeev Khingorami	Kathleen Owen
Jim Hanley	Lubos Forest	David Matier
Geoff Crosby	Zied Driss	Christine Stanfel
Chris Fischer	Tim Johnson	Kyung-Ju Choi
Dale Montgomery	Bob Burkhead	Charlie Seyfer
Nancy Zimmerman	Bruce McDonald	Don Thornburg
Kevin Morrow	Paolo Tronville	John Horns
Robert Martin	Rahul Bharadwaj	John Simenson (Vice Chair)

ATTACHMENT #5

TC 2.4 Program Subcommittee Meeting – New York, NY

20-Jan-2014

Monday 10:00 – 11:00 (Concourse B (HC))

21 people attended; 2 of 6 proposed programs were accepted for NY !! (*vs. none accepted for Dallas & Denver*)

suggest writing clearer outcomes of expected discussion for Forums & Seminars & **SEND Abstracts for feedback to ML**

ACCEPTED for New York =

Jan 18-22, 2014

Type	Title	CoSponsor	Chair
Seminar 28	A Comprehensive look.....What makes you Sick?	TC 2.3	Zied Driss
Seminar 37	Real Co\$t of Filtration for IAQ (5th resubmit worked)!!	TC 2.3	KJ Choi
Conf. Paper Sess 2, Sun 9:45am	ASHRAE 145.2 Efficiency & Capacity Test Results for 5 Gas-Phase Air Cleaners (NY-14-C005)	author: M. Kathleen Owen	
POSTER Sess 2, Tues 11am-1pm	How do Pressure drop, Efficiency, Weight Gain & Loaded Dust Change throughout Filter Lifetime (RP-1360) (NY-14-032)	author: M. Kathleen Owen	

The Conference's Technical Program addresses broad topics in the **application of technology to practice**, specific applications in **ground source heat pumps, O&M and indoor environmental quality**, as well as **new reports on research** taking place worldwide.

***** **Track: Indoor Environmental Quality** *****

Track Chair: Thomas H. Kuehn Email: kuehn001@umn.edu

The complex relationship between indoor and outdoor environmental conditions, coupled with the impacts of climate change, requires buildings that are comfortable and healthy for the occupants yet also energy efficient. The Indoor Environment—Health, Comfort and Productivity Track highlights the state of knowledge of the balance of environmental health and energy efficiency in buildings and research directions.

Also is a **Professional Skills Track & Standards, Guidelines and Codes Track**

Seattle seminar & forum
& Workshop proposals
(abstracts) deadline
= **FEBRUARY 13th**

Workshops need
Learning OBJECTIVES
written

(Includes Bio, Learning
Objectives and Methods
of Assessment).

>>>>

Learning Objectives: The Learning Objectives should complete the statement, "After attending this session, the attendees will be able to..." Learning Objectives need to be addressed by the speakers and should use measurable verbs such as "Explain," "Describe," "Distinguish," "Design," "Apply," etc.:

June 28-July
2, 2014

Proposed for Future = SEATTLE =

Type	Title	CoSponsor	Chair
Workshop	How can Filters be rated by their PM (PM1, PM 2.5, PM 10, etc.) performance?	52.2 ?	Don Thornburg (& Bruce McDonald &?)
Workshop	In the year 2035, will filtration be alive? (what will it look like?)...or Back to the Future, what will Filtration look like?	2.3, 2.4	Brian Krafthefer
Seminar	Life cycle Co\$\$(LCC); Energy; Residential ?? [NEW YORK]	2.3	Jeff Siegel ? Seattle or Chicago?
Seminar	The Current & Future IAQ Procedure: ASHRAE, LEED, & Beyond -- SSPC 62.1 sponsoring (for 90-min program)	2.3, 2.4 (email voted), EHC(?), TRG4.1(?), IAQP(?)	Chris Muller
Seminar talk	Truth or Consequences; what does a Filter really catch? (RP 1360)(if transactions talk is in NY)	?	Kathleen Owen
Workshop	Differences in Filtration Test Standards (EN779 vs. 52.2 vs ISO)	2.3, 2.4	Paolo Tronville, Al Veeck, Tom Justice's speaker

Jan 24-28,
2015

Proposed for Future = Chicago =

Type	Title	CoSponsor	Chair
Seminar	Does Particulate Matter, matter? (possible health effects of ultrafines: autism (EPA= C Seyffer contact, Long Beach) or cardio-vascular= Al Veeck contacts)LBL speaker (Singer?) -what about ozone interest?	2.5?	Marilyn Listvan
Seminar	Do we Need a Separate Test Standard for Residential Filters?		Tom Justice
Seminar	How can Filters be rated by their PM (PM1, PM 10, etc.) performance?	52.2 ?	Don Thornburg

Proposed for Future Atlanta =

June , 2015

Type	Title	CoSponsor	Chair
Tech paper(s)	Expert's Advice on Saving Energy with Filters; What you don't know can Co\$t you. (Steve Nicholas' talk/paper: "Hidden Energy co\$ts right before your eyes") (also Jeff Seigel's seminar & Paolo (Intl)	2.3, 52.2 ?	Brian Krafthefer
Symposium	Filtration for Hospitals (FGI?)		Zied Driss

Attendees

Al Veeck	Jan Fretthold	Kartik Potukuchi	Tom Justice
Tim Johnson	Don Thornburg	Charles Seyffer	Laura Kiefer
Brian Krafthefer	Michael Corbat	Zied Driss	Paolo Tronville
John Simenson	Gemma Kerr	Volker Haendler	Len Duello
Kyung-Ju (K J) Choi	Sanjeev Hingorani	Dale Montgomery	Michael Sexsmith
Marilyn Listvan			

ATTACHMENT #6

ASHRAE MEETING MINUTES – New York TC 2.4 - Particulate Contaminants/Removal Equipment

Handbook Subcommittee Meeting

Sat. Jan 18, 2014 1:00 – 2:30

1. Call to order 1:00 PM Eric Brodsky, Chair
2. Introductions
3. Attendees: Pat Marks, Michael Sexsmith, Dan Haas, Gemma Kerr, Brian Krafthefer, John Simenson, Kartik Potukuchi, Volker Haendler, Phil Maybee, Bob Burkhead, Tim Johnson, Grace Byfield, Kathleen Owen, Don Thornburg, Tom Justice, Len Duello, Eric Brodsky

4. Session Notes

Chapter 29 was published in 2012 and updates for 2016 need to be complete and submitted to ASHRAE by April 2015.

We conducted a working session and reviewed the entire document for updates. About 10 areas were identified to be updated by specific volunteers.

5. Next Steps

E. Brodsky will distribute the most recent chapter with meeting updates. Reviewers will update respective areas and return in 4 weeks. The updated handbook will be redistributed for final review 4 weeks prior to the Seattle meeting. The plan is to be ready for a TC 2.4 vote at the January 2015 meeting.

6. Other Business- none

Meeting adjourned -2:30

Prepared by Eric Brodsky,

Draft Minutes submitted: 1/20/2014

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