

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND
AIR-CONDITIONING ENGINEERS, INC.

1791 Tullie Circle, N.E.

Atlanta, GA 30329

404-636-8400

TC MINUTES COVER SHEET

TC/TG/TRG NO _____ TC 5.2 _____ DATE June 28, 2016 _____

TC/TG/TRG TITLE _____ Duct Design _____

DATE OF MEETING June 28, 2016 _____ LOCATION St. Louis, MO _____

MEMBERS PRESENT	TERM TO	MEMBERS ABSENT	YEAR APPT D	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Bob Reid, Chair	6/30/17	Johnny Andersson	MNQ	John Constantinide, CM
Tim Eorgan, Vice Chair	6/30/18			Robert Hassler, CM
Scott Hobbs, Sec.	6/30/18			Bruce Meyer, CM
Herman Behls	6/30/17			Gert Jensen, PCM
Pat Brooks	6/30/19			Karina Saenz Acosta, G
Wesley Davis	6/30/16			Mark DeRod, G
David Dias	6/30/19			Gus Faris, G
Kevin Gebke	6/30/17			Eli Howard, G
John Hamilton	6/30/19			Ed Koop, G
Steve Idem	6/30/16			Shawn Ohara, G
Ralph Koerber	6/30/16			Tim Orris, G
Gary Miller	6/30/16			Perry Philip, G
Vikram Murthy	MNQ			Kezhen Shen, G
Bill Stout by Teleconference	6/30/17			Mark Owen, Staff
Craig Wray	6/30/17			

MNQ -- Member Non-Quorum

CM = Corresponding Member

PCM = Provisional Corresponding Member

G = Guest

DISTRIBUTION

All Members of TC plus the following:	
TAC Section Head	Ken Peet
TAC Chair	Dr. Thomas Lawrence
2017 Handbook Liaison (Fundamentals)	Larry Akers
2016 Handbook Liaison (Systems & Equipment)	Annette Dwyer
Research Liaison	David John
Standards Liaison	Dr. Arsen Melikov
ALI/PDC	Cameron Labunski
Chapter Tech Transfer	James Arnold
Staff Liaison	Mike Vaughn

**AMERICAN SOCIETY OF HEATING, REFRIGERATION AND
AIR-CONDITIONING ENGINEERS**

**1791 Tullie Circle, N.E.
Atlanta, GA 30329**

ASHRAE Annual Conference, St. Louis, MO

TC 5.2 Duct Design

**Tuesday, June 28, 2016
Time: 3:30-6:00 PM**

**Location: Marriott St. Louis Grand
Americas Convention Center Complex
Room 229**

- 1) **Call to Order**
- 2) **Introductions and Attendance**
 - a) Introduction of people present
 - b) It was determined a Quorum was present
 - c) Quorum: 15 voting members present, with Bill Stout attending via teleconference.
 - d) There were no corrections/additions to the proposed agenda
- 3) **Orlando (January 2016) Meeting Minutes.**
 - a) Minutes from the Orlando meeting were approved 9-0-0 CNV by electronic ballot March 1, 2016.
- 4) **Special Announcements**
 - a) **ASHRAE Code of Ethics** – “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.
 - b) **ASHRAE Vision** - ASHRAE will be the global leader, the foremost source of technical and educational information, and the primary provider of opportunity for professional growth in the arts and sciences of heating, ventilating, air conditioning and refrigerating.
- 5) **Section Head Report (Ken Peet)**
 - a) Ken Peete commented that out of 160 proposed presentations and programs at a typical ASHRAE seminar, only 64 are accepted. Recommends as many programs/presentations be performed at the local committee level. Gus Faris raised concerns about time constraints having programs during the full committee meetings. Suggested such programs be handled at the sub-committee level.
 - b) Please update on-line your ASHRAE bio
- 6) **TC 5.2 Chair Report (Bob Reid)**
 - a) **Acknowledgement of the Passing of Jerry Sipes**
Bob Reid and Gus Faris recognized the impact Jerry Sipes had on TC

5.2, 5.3, and ASHRAE as a whole. Gus also noted the family has established a foundation at KSU for cancer survivors.

b) Acknowledgement of the Passing of John Stratton

Herman Behls commented on the impact John Stratton had on TC 5.2 and SMACNA, especially in the evaluation of duct construction standards. John is responsible for duct leakage factors that are now used to predict duct leakage. John was also instrumental in ASHRAE/SMACNA Standard 126, Method of Testing HVAC Air Ducts.

c) Outgoing TC5.2 voting members: Wes Davis, Steve Idem, Ralph Koerber, Gary Miller

d) TC 5.2 incoming voting members: Cindy Bittel, Bill Smith, Neal Walsh

e) Section 5 Head (Ken Peet) to spearhead a meeting to work on common technical issues.

f) Acknowledgment of our PCM's

- i) Gert Jensen – KE Fibertec
- ii) Marc Sorge – Greenheck Fan Corp,

g) Historian (open)

h) Education internal to the TC:

Phenolic duct presentation by Gavin Hunter of Kingspan (Atlanta, GA)

i) Honors and Awards (Steve Idem)

- i) Mr. Herman Behls, P.E. --- Distinguished 50-Year Member Award
- li) Mr. Craig Wray, P.Eng. --- Exceptional Service Award
- lii) Dr. Jerry Sipes, Ph.D., P.E. --- Standards Achievement Award

7) Subcommittee Reports

a) Handbook (Herman Behls)

- i) Herman Behls to send out the 2013 Handbook Duct Design chapter for comments.
- ii) Known comments will be shown. Comments due to Herman Behls by 1 November.
- iii) Approved 2017 chapter will be sent to Staff 2 January 2017.

b) Programs (Steve Idem)

- i) Steve Idem recommended additional educational programs such as the one we had on Phenolic Duct

c) Duct Design Guide (Pat Brooks)

- i) Pat Brooks noted the design guide goal is to be finished 2017.
- ii) Gus Faris will send VAV box sizing information.
- iii) ASHRAE has set up an FTP site for the Duct Design Guide
Site address: <http://files.ashrae.org/>
Username: tc5.2ddg
Password: DDG@dm1n1

d) Duct Fitting Database (Herman Behls and Pat Brooks)

- i) Herman Behls motioned and Pat Brooks seconded to withdraw the current DFDB App. The DFDB App was never reviewed by TC 5.2 and is not being maintained. The motion was approved 14-0-0 CNV.

- ii) A sub committee was formed to look at methods on how to most effectively maintain the DFDB database; Larry Smith will chair, and Steve Iden Kevin Gebke, and Pat Brooks will make-up the subcommittee

Pat Brooks suggested a contract with an outside organization be contacted to maintain the Duct Fitting Database. Costs of the outside contract would come from increasing the cost of the DFDB.

- iii) Online DFDB remains on hold. No copies are being sold until all outstanding issues are resolved.

e) **Codes and Standards Interaction (Ralph Koerber)**

- i) By electronic ballot: Kevin Gebke moved that ASHRAE TC 5.2 ask ASHRAE's representative at code hearings, Steve Ferguson, to support the IAPMO UMC 2018 code change proposal Item # 088 (see Exhibit 1). Second by Wes Davis. The motion was approved 10-0-2-CNV. Abstentions were Dr. Steve Iden (did not feel he was familiar enough with the item) and Craig Wray (in process of moving and did not have time for adequate consideration).

The UMC Technical Committee rejected proposal # 088.

- ii) See Exhibit 2 for subcommittee report.

f) **ASHRAE Learning Institute (ALI) (Pat Brooks)**

- i) Duct Design Guide
- ii) ASHRAE HVAC Design Training sessions: Level I, August 8-18, 2016 (Atlanta) and Level II, August 11-12, 2016 (Atlanta). For information go to www.ashrae.org/hvacdesign.

g) **Webmaster (John Constantinide)**

- i) TC 5.2 Website: <https://TC0502.ashraetcs.org/>

h) **Standards Liaison Reports**

- i) SSPC 90.1 (Mark Smith)- Nothing to report
- ii) SSPC 189.1 (Scott Hobbs)- Waiting for confirmation
- iii) SPC 215P (Craig Wray)- Work continues on ASHRAE Standard 215P

i) **Research (Behls)**

- i) 1180-RP Duct Design Guide --- Project defaulted 2004 by original contractor, Duct Design Guide to be completed by TC5.2.
- ii) 1606-RP [University of Illinois (Flat Oval transitions)] --- 100% Complete
- iii) 1682-RP --- Principal Investigator Dr. Sleiti presented results at Orlando meeting (January 2016). Final report received and is being reviewed,
- iv) RATAR-1764 approve by RAC January 2016. Work Statement submitted to RAC 15 August for approval.
- v) WS-1759 --- rejected by RAC. Removed from list of active work statements. TC5.2 will determine the fittings required to support ASHRAE's Duct Fitting Database (DFDB) by comparing the 220 fittings in the database and the fittings in the library of machinery manufacturers, and provide justification for future additional testing to support the DFDB.

j) **Standards**

- i) SPC 120-2016 (Kevin Gebke).-Out for third public review.

- ii) SPC 126-2016 (Kevin Gebke).-Approved and is being published.
- iii) SPC 215P MOT to Determine Leakage of Operating HVAC Air Distribution Systems (Craig Wray).

8) **Deadlines**

- i) 2017 ASHRAE Winter Conference in Las Vegas: www.ashrae.org/lasvegas
Program proposals are due August 8, 2016.
- ii) RTARs and Work Statements due August 15, 2016.
- iii) Duct Design chapter due 2 January 2017.

9) **Old Business**

- a) FAQs: Review of ASHRAE's Technical Services Department "Technical FAQ's" (Tim Eorgan)

Current FAQ versions will remain posted until either a new version is provided by the TC or the TC asks to remove the item.

A motion by Craig Wray and seconded by Herman Behls that TC5.2 recommends that the current four FAQ's assigned to TC 5.2 (listed below) be removed from ASHRAE's Technical Service Department "FAQ's" list because they are not supported by ASHRAE research. The vote was 14-1-0 (15).

- FAQ 19 "What is ASHRAE's recommendation regarding duct cleaning"
- FAQ 20 "What is ASHRAE's position on the use of internal duct lining"
- FAQ 55 "Does ASHRAE have recommendations for return-air plenum design"
- FAQ 64 "What is ASHRAE's position on the use of flexible internal insulation in ducts or fiberglass ductboard"

10) **New Business**

- a. Craig Wray suggested TC5.2 needs to evaluate who we are and what future direction we should take. John Constantinide will head a panel to determine the relevance of TC5.2. Craig Wray, Pat Brooks, Larry Smith and Cindy Bittel will also be a part of the panel

11) **Action Items**

TC 5.2 Action Items			
No.	Description	Assign to	Status
1	Comparison of DFDB fittings vs. plasma machine libraries or current manufacturer's catalog. Purpose: Determine which popular fittings should be added to the DFDB.	Larry Smith (Lead) Herman Behls	Active (initiated Jan 2014)
2	New Subcommittee Advocacy objectives for air distribution systems in existing and new buildings	John Hamilton, Lead David Diaz Larry Smith Mark Smith	Active (initiated Jan 2014)
3	FAQ 19 "What is ASHRAE's recommendation regarding duct cleaning"	See Item 10.	Completed This Meeting (initiated June 2015)
4	FAQ 20 "What is ASHRAE's position on the use of internal duct lining"	Voted 14-1-0 (15) to withdraw FAQs.	

5	FAQ 55 “Does ASHRAE have recommendations for return-air plenum design”	Chair (Bob Reid) to advise ASHRAE Staff	
6	FAQ 64 “What is ASHRAE’s position on the use of flexible internal insulation in ducts or fiberglass ductboard”		
7	RTAR – Cost to Seal Ductwork	Bob Reid (Lead) Neil Walsh Pat Brooks	Active (initiated Jan 2016)
8	Add Historian position to roster. Fill Historian position	Bob Reid (Chair)	Active (initiated Jan 2016)
9	DFDB App. See Item d(i). TC voted 14-0-0 CNV that DFDB App not be sold.	Bob Reid (Chair) to forward TC action to Steve Comstock	Active (initiated June 2016)
10	Building Materials for Duct Construction Study (see Exhibit 2, Item #2)	Code & Standards Interaction Subcommittee	Active (Initiated June 2016)
11	New Subcommittee: How to maintain the DFDB?	Larry Smith (Lead) Pat Brooks Kevin Gebke Steve Idem	Active (Initiated June 2016)

12) **Adjournment**

6:05 PM

Exhibit 1 Change # 088

Exhibit 1 Item 88.pdf - Adobe Acrobat Reader DC

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Exhibit 1
Change # 088

UMC 2018 – (603.13, Table 1701.1): Item # 088

SUBMITTER: Marguerite Carroll, Underwriters Laboratories (UL), LLC

RECOMMENDATION: Add new text as follows:

603.0 Installation of Ducts.

603.13 Air Dispersion Systems. Where installed, air dispersion systems shall be completely in exposed locations, only in duct systems under positive pressure, and not pass through or penetrate fire-resistant-rated construction. Air dispersion systems shall be listed and labeled in accordance with UL 2518.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
UL 2518-2005	Outline of Investigation for Air Dispersion System Materials	Duct Systems	603.13

Note: UL 2518 was not developed via an open process having a published development procedure in accordance with Section 3-3.7.1.2 of IAPMO's Regulations Governing Committee Projects.
(portions of table not shown remain unchanged)

SUBSTANTIATION:
Air diffusions systems (also known as duct socks or fabric ducts) are frequently used in exposed locations, however, requirements for these products are not currently covered by the code. This proposal will provide guidance on the proper installation and safety requirements for these products.

COMMITTEE ACTION: Reject

COMMITTEE STATEMENT:
The UL 2518 standard is going through the ANSI accreditation process. Furthermore, "air dispersion systems" is not defined.

TOTAL ELIGIBLE TO VOTE: 24

VOTING RESULTS: AFFIRMATIVE: 22, NOT RETURNED: 2 Howard, Smith

COMMENT ON AFFIRMATIVE:

ADLER: I am agreeing with the Committee action to reject this proposal.

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Exhibit 2

Codes and Standards Interaction Subcommittee Report

1. IAPMO Duct Task Group

Scope of Task Group - review Chapter 6 of the 2015 Uniform Mechanical Code (UMC) and provide recommendations to the UMC Technical Committee before January 4th, 2016. The Task Group held over 15 hours of teleconferenced meetings to review recommendations on all aspects of duct systems in Chapter 6. Aspects of interest to TC 5.2 are

a. Air Duct limitation of 5 feet for commercial applications.

- **The UMC Technical Committee rejected the following proposal (# 071) by the IAPMO Duct Task Group to change 5 ft to 6 ft and that engineered systems be an exception to the 5 ft flexible duct limitation.**

“603.4.1 Length Limitation. Factory-made flexible air ducts ~~and connectors~~ shall be not more than ~~5~~6 feet (~~1524~~1829 mm) in length ~~and shall not be used in lieu of rigid elbows or fittings.~~

Exceptions:

(1) **Residential occupancies.**

(2) **Where engineered and sized for longer lengths in accordance with Section 302.3.”**

- **The UMC Technical Committee accepted the following proposal (# 072) by Randy Young (Sacramento, JATC representing “trade”) to remove the current residential exclusion and limit flexible duct in residential sustems to 5 ft.**

603.4.1 Length Limitation. Factory-made flexible air ducts and connectors shall be not more than ~~5~~ feet (1524-mm) in length and shall not be used in lieu of rigid elbows or fittings.

~~Exception: Residential occupancies.~~

b. Air Connectors. The UMC Technical Committee accepted this proposal and voted to prohibit air connectors in the 2018 version of the UMC.

- c. The Task Group recommended appropriate language to add Phenolic Ducts constructed per SMACNA “Phenolic Duct Construction Standards.” **The UMC Technical Committee accepted this proposal for addition to the 2018 UMC.**

- d. The TC 5.2 Task Group recommended the addition of ten flexible duct installation requirements (taken from the recommendations previously made by the TC 5.2 Codes & Standards Interaction Subcommittee to improve flex installations. **The UMC Technical Committee accepted this proposal for inclusion in the 2018 UMC.**

1. Ducts shall be installed using the minimum required length to make connections.
2. Horizontal duct runs shall be supported at not more than 4 feet (1219 mm) intervals.
3. Vertical risers shall be supported at not more than 6 feet (1829 mm) intervals.
4. Sag between support hangers shall not exceed 1/2 inch (12.7 mm) per foot (305 mm) of support spacing.

5. Supports shall be rigid and shall be not less than 1-1/2 inches (38 mm) wide at point of contact with the duct surface.
 6. Duct bends shall be not less than one duct diameter bend radius.
 7. Screws shall not penetrate the inner liner of non-metallic flexible ducts unless permitted in accordance with the manufacturer's installation instructions.
 8. Fittings for attaching non-metallic ducts shall be beaded and have a collar length of not less than 2 inches (51 mm) for attaching the duct. Exception: A bead shall not be required where metal worm-gear clamps are used or where attaching metallic ducts using screws in accordance with the manufacturer's installation instructions.
 9. Duct inner liner shall be installed at not less than 1 inch on the collar and past the bead prior to the application of the tape and mechanical fastener. Where mastic is used instead of tape, the mastic shall be applied in accordance the mastic manufacturer's instructions.
 10. Duct outer vapor barriers shall be secured using 2 wraps of approved tape. A mechanical fastener shall be permitted to be used in place of, or in combination with the tape.
- e. The Task Group had a lot of discussion regarding the use of building materials (i.e. framing members and gypsum board) for supply and return ducts without specific requirements for performance and moisture mitigation like other duct materials. **No recommendation was made to the UMC Technical Committee.**

2. An action item was previously initiated for the Codes & Standards Interaction subcommittee to review the use of building materials for duct construction in regards to potential addition to the Duct Construction chapter of the ASHRAE Handbook, HVAC Systems and Equipment. No work has been done on this topic. New action is as follows:

The Codes & Standards Interaction Sub-Committee will review current code requirements and other available information regarding the use of gypsum and other building materials for duct construction. The goal is to draft a section or paragraph to add to the "Materials" section of the ASHRAE Duct Design Guide and Handbooks. Consideration will be given to fire safety, microbial characteristics, leakage, etc. Time frame for completion is "before" the Las Vegas January 2017 meeting so the text can be circulated to the TC members before the meeting.

3. NFPA 90A and 90B

The proposals indicated at the TC winter meeting (January 2016) are out for public comment and comments will be reviewed by the NFPA Technical Committee later this year. The second draft version of the standards will then be developed by NFPA and circulated again for comment.