



DRAFT AGENDA

**ASHRAE SSPC-34: Designation and Nomenclature Subcommittee
SSPC-34: Designation & Safety Classification of Refrigerants**

**Palmer House, Room Water Tower (6th Floor)
Saturday, June 20, 2018; 7:00 AM - 10:00 AM**

1. CALL TO ORDER

1.1. Introduction of Members and Guests

1.2. ASHRAE Code of Ethics Review (ATTACHMENT 1)

“Commitment to the ASHRAE Code of Ethics – In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)”

2. ROSTER REVIEW

2.1. Any changes/corrections to SSPC 34, Designation and Nomenclature Subcommittee

2.2. Quorum Determination (13 voting members)

<i>Producer/Refrigerant</i> (3)	<i>User/Systems</i> (4)	<i>User/Components</i> (1)	<i>General</i> (4 + 1)
Sean Cunningham (C 2019)	Warren Clough (C 2019)	Chris Seeton <i>Chair</i> (C 2018)	Brian Fricke (S 2021)
Mary Koban (S 2019)	William Kopko (S 2019)	Julie Majurin (C 2021)	Thomas Leck (S 2018)
Samuel Yana Motta (C 2018)	Chun-cheng Piao (C 2018)		Sonny Sundaresan (C 2021)
	Elyse Sorenson (S 2021)		Jing Zheng (S 2019)
			Dave Wilson (2018) Consultant (NVM)

X members present, DW not present as NVM, Quorum achieved?

3. AGENDA REVIEW

ACTION: *Approve/revise the agenda for the meeting.*

Coffee Break~8:30am

Motion : XXX move to accept. YYY 2nd. X-0-0-Y-CNV (yes/no/abstain/absent – chair)

4. MINUTES OF THE LAST MEETING

ACTION: *Approve/revise the minutes of the Long Beach 2017 meeting.*

Motion : XXX move to accept. YYY 2nd. X-0-0-Y-CNV (yes/no/abstain/absent – chair)

5. REVIEW APPLICATIONS FOR REFRIGERANT DESIGNATION & SAFETY CLASSIFICATION

5.1. Jiangsu Freeze Environmental Protection (R0091-16-12)

Zeotropic blend: **R-290 / 600a (95.0 / 5.0)**

(**± 2.0 / ± 2.0**) mass %

Molecular mass: 44.6 g/gmol

Bubble Point @ 101kPa: -41.5 °C (-42.7 °F)

Dew Point @ 101kPa: -39.5 °C (-39.1 °F)

ACTION: Review corrections and develop a recommendation for the PC

Long Beach: Motion by Sonny / seconded by Chung to approve pending corrections received on Application R0097-17-05

Motion passed: 8 / 0 / 0 / CNV_ (For / Against / Abstain / Chair Voting [CV] or Chair Not Voting [CNV])

Comments: Quick review to make sure corrections are to committee satisfaction.

5.2. Asahi Glass Company (R00064-15-05)

Approved by D&N in 2015

ACTION: None - *INFORMATION ONLY – D&N has an open motion on the floor of committee*

5.3. Asahi Glass Company (R0065-15-05)

Zeotropic blend: R-1123 / 32 (45.0/55.0) (±2.0 / ±2.0) by mass%

Molecular mass: 113.1 g/gmol
Bubble Point @ 101kPa: -42 °C (-43.6 °F)
Dew Point @ 101kPa: -37 °C (-38.3 °F)

Approved by D&N in 2015

ACTION: None - *INFORMATION ONLY* – D&N has an open motion on the floor of committee

5.4. Asahi Glass Company (R0066-15-05)

Zeotropic blend: R-1123 / 32 (40.0/60.0) (± 2.0 / ± 2.0) by mass%

Molecular mass: 113.1 g/gmol
Bubble Point @ 101kPa: -42 °C (-43.6 °F)
Dew Point @ 101kPa: -37 °C (-38.3 °F)

Approved by D&N in 2015

ACTION: None - *INFORMATION ONLY* – D&N has an open motion on the floor of committee

5.5. Asahi Glass Company. (R0089-16-12)

Zeotropic blend: R-1123 / 32 / 1234yf (19.0 / 55.0 / 26.0) (± 2.0 / ± 2.0 / ± 2.0) by mass %.

Molecular mass: 65.9 g/gmol
Bubble Point @ 101kPa: -53.1 °C (-63.6 °F)
Dew Point @ 101kPa: -50.8 °C (-59.4 °F)

Approved by D&N in Jan 2017

ACTION: None - *INFORMATION ONLY* – D&N has an open motion on the floor of committee

6. PUBLICATION PUBLIC REVIEW DRAFTS

6.1. Standard 34-2016 Status:

6.1.1. The following have been published on the ASHRAE website as formal addenda to Standard 34-2016:

34h-2016 This addendum removes the application fee from Standard.34.

34j-2016 This addendum adds the zeotropic blend R-460C [R-32 / 125 / 134a / 1234ze(E) (2.5 / 2.5 / 46.0 / 49.0 by mass %)] to Table 4-2 and Table D-2 as A1.

34k-2016 This addendum adds the zeotropic blend R-464A [R-32 / 125 / 1234ze(E) / 227ea (27.0 / 27.0 / 40.0 / 6.0 by mass %)] to Table 4-2 and Table D-2 as A1.

34l-2016 This addendum adds the zeotropic blend R-407I [R-32 / 125 / 134a (19.5 / 8.5 / 72.0 by mass %)] to Table 4-2 and Table D-2 as A1.

34m-2016 This addendum adds the zeotropic blend R-465A [R-32 / 290 / 1234yf (21.0 / 7.9 / 71.1 by mass %)] to Table 4-2 and Table D-2 as A2.

34n-2016 This addendum makes changes to the toxicity classification procedure (to be based on the nominal formulation of the blend) with the intent to harmonize ASHRAE Standard 34 and ISO.

➤ **NO ACTION:** For information only

6.1.2. There were comments received on the public review drafts of the following addenda.

34i-2016 This addendum proposes the addition of a zeotropic blend, tentatively identified as R-463A [R-744 / 32 / 125 / 1234yf / 134a (6.0 / 36.0 / 30.0 / 14.0 / 14.0 by mass %)] to Table 4-2 and Table D-2 as A1.

➤ **NO ACTION:** For information only. Review task assigned to Flammability Subcommittee

7. CONTINUOUS MAINTENANCE PROPOSALS

7.1. Continuous Maintenance Proposals (C. Seeton) CM 34-15-12-0002/001-00

7.1.1. CM 34-15-12-0002/001

Page number and clause (section), subclause, or paragraph number: 4

Proposal: [X] Add new text as follows

Proposed change:

An identifying number shall be assigned to each *single component* and *blend* refrigerant. Blends may be composed of fluids without a single component identifying number.

Reason and Substantiation:

The safety of the pure refrigerant or blend is important when evaluating a material used in HVAC&R equipment. When a component is not intended for use in its pure form, the safety designation of the pure material is not the governing protective measure – the safety designation of the blend composition, fractionation, flammability, and toxicity are paramount.

Currently appears in ASHRAE Standard 34-2013:

4. NUMBERING OF REFRIGERANTS

An identifying number shall be assigned to each refrigerant. Reference C1 in Informative Appendix C provides background on the need for a standard refrigerant nomenclature. Assigned numbers are shown in Tables 4-1 and 4-2.

7.1.2. CM 34-15-12-0002/002

Page number and clause (section), subclause, or paragraph number: 4.4

Proposal: Add new text as follows

Proposed change:

...end of paragraph... For a blend containing a fluid without a Standard 34 classification and designation, the composition shall use the official IUPAC chemical name and not a self-interpreted ASHRAE Standard 34 R number.

Reason and Substantiation:

The safety of the pure refrigerant or blend is important when evaluating a material used in HVAC&R equipment. When a component is not intended for use in its pure form, the safety designation of the pure material is not the governing protective measure – the safety designation of the blend composition, fractionation, flammability, and toxicity are paramount.

Currently appears in ASHRAE Standard 34-2013:

4.4 Blends shall be identified by the designations assigned in this standard. Blends without assigned designations shall be identified by their compositions, listing the components in order of increasing normal boiling points separated by slashes, for example, R-32/134a for a blend of R-32 and R-134a. Specific formulations shall be further identified by appending the corresponding mass fractions expressed as percentages to one decimal place and enclosing them in parentheses, for example, R-32/134a (30.0/70.0). No component shall be permitted at less than 0.6% m/m nominal. When formulation tolerances are relevant to the discussion, the corresponding tolerances shall be appended in a second set of parentheses, for example, R-32/125/134a (30.0/10.0/60.0) (+1.0,-2.0/±2.0/±2.0) for a blend of R-32, R-125, and R-134a with nominal mass fractions of 30.0%, 10.0%, and 60.0%, respectively, and mass fractions of 28.0% to 31.0%, 8.0% to 12.0%, and 58.0% to 62.0% with tolerances, respectively.

7.1.3. CM 34-15-12-0002/003

Page number and clause (section), subclause, or paragraph number: 9.1.6.1

Proposal: Delete without substitutiion

Proposed change:

~~The components of refrigerant blends must be individually classified before classifications will be assigned to blends containing them. Applications for designation and classification of blends, therefore, shall be accompanied with safety or preceded by applications for all components not yet classified in this standard.~~

Reason and Substantiation:

For blends, the safety (flammability and toxicity) are evaluated for the blend that will be utilized in the HVAC&R industry. This safety testing is necessary for the blend as formulated and as fractionated per the standard requirements. If a pure component is not intended as a pure material entering into ASHRAE's scope, its safety as an individual material is immaterial. The blend composition should use the official IUPAC chemical name and not a derived or self-interpreted ASHRAE R number.

Currently appears in ASHRAE Standard 34-2013:

9.1.6 Blends

9.1.6.1 Components. The components of refrigerant blends must be individually classified before safety classifications will be assigned to blends containing them. Applications for designation and classification of blends, therefore, shall be

accompanied or preceded by applications for all components not yet classified in this standard.

Note: In January 2016, PC voted to address this in June 2016.

Discussion followed

- A motion was made to reject the CMP to classify the pure material due to not being consistent with the standard. Vote was 4 / 3 / 2 / 6.
- It was determined that additional time was needed to better review this recommendation and to include a discussion of all three Seeton proposals together.

***ACTION: D&N motion needed* Bill Kopko, Tom Leck, Ken Schultz and Chris Seeton**

8. INFORMATIVE CHECKLIST UPDATE -

The checklist will need updating on SI and IP reporting requirements in Section 9.9.2 when the addendum is approved by the Standards Committee.

Notes: Not sure about 9.9.2 correction status. Draft language striking out either-or statement?

9. REFRIGERANT CODES UPDATE

9.1. ASHRAE CIS feedback on Standard 34

10. OLD BUSINESS

10.1 Tolerance and Accuracy

Update on an item proposed by Chris Seeton at the Seattle meeting to add limits of tolerance for accuracy to values of physical properties listed or cited in applications to ASHRAE. Pressures, temperatures, calculated values etc. will be affected. Seeton, McLinden, and Clough developed a drafted recommendation for the January Chicago meeting. Team agreed to go back and look at values from applications to assess variation.

10.2 Overlapping Refrigerant Blend Requirements

10.2.1 Small committee response – Mary Koban

There is a concern about blends that have overlapping compositions/tolerances. Should we be setting guidelines to avoid similar compositions?

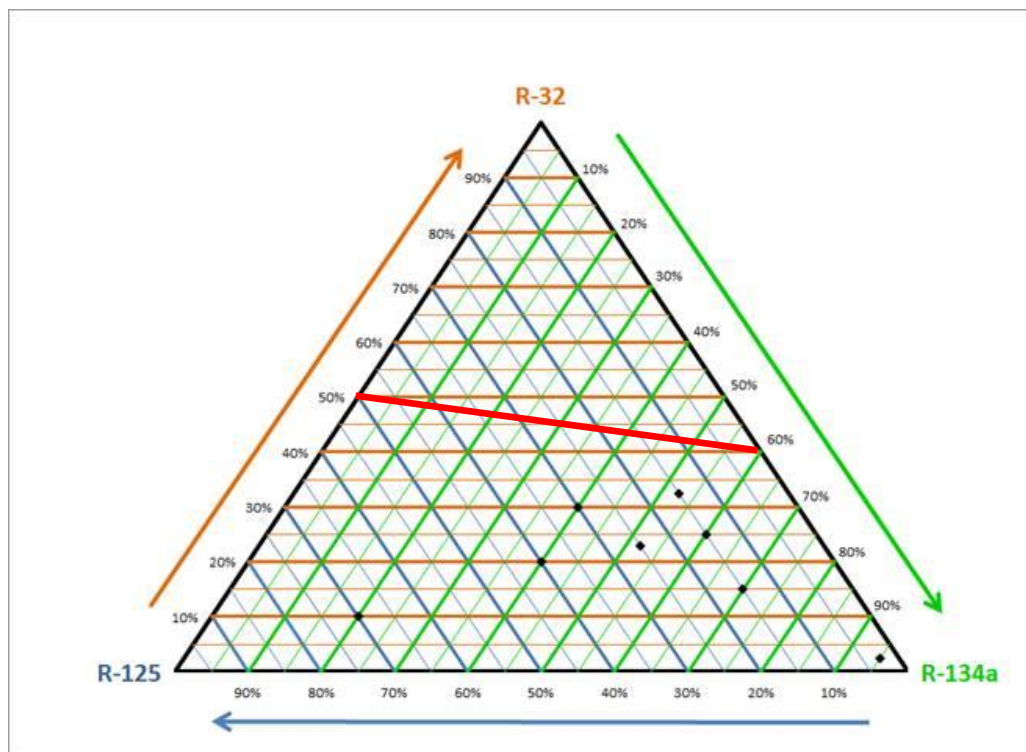
Is there impact on blends with ± 0.1 composition accuracies?

Is there a convenient method for keeping up with the blends?

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Update from Mary and small committee. .

Chair is requesting that in addition to measurement and charting discussion. The small group develop an approach for blend uniqueness criteria.



10.3 Move cis (Z) and trans (E) description out of propene section into standalone section
10.3.1 Discussion from Orlando

Motion: Strike the following from section 4.1.10 and move to new section 4.1.13

“In the case where stereoisomers can exist, the opposed (Entgegen or trans) isomer will be identified by the suffix (E) and the same side (Zusammen or cis) isomer will be identified by the suffix (Z). An example of this system is given in Table A-3 of Informative Appendix A.”

Motion by Tom / seconded by Julie

Motion passed: 11 / 0 / 0 / CNV

ACTION: Passed in Orlando, Follow up with full committee, still not sure where this stands.

11 NEW BUSINESS

11.1 Correct language to allow for proper naming of molecules containing iodine

NOTE: The standard already considers Iodine in section 4.1.7 and Appendix A Isomer Designation.

3. DEFINITIONS OF TERMS

halocarbon: as used in this standard, a hydrocarbon derivative containing one or more of the halogens bromine, chlorine, ~~or~~ fluorine or iodine; hydrogen also may be present.

4. NUMBERING OF REFRIGERANTS

4.1.5 In those instances where bromine (Br) is present in place of part or all of the chlorine, the same rules apply, except that the uppercase letter “B” after the designation for the parent chlorofluoro compound shows the presence of bromine. The number following the letter “B” shows the number of bromine atoms present.

4.1.6 In those instances where iodine (I) is present in place of part or all of the chlorine, the same rules apply, except that the uppercase letter “I” after the designation for the parent chlorofluoro compound shows the presence of iodine. The number following the letter “I” shows the number of iodine atoms present.

4.1.76 The number of chlorine (Cl) atoms in the compound is found by subtracting the sum of fluorine (F), bromine (Br), iodine (I) and hydrogen (H) atoms from the total number of atoms that can be connected to the carbon (C) atoms. For saturated refrigerants, this number is $2n + 2$, where n is the number of carbon atoms. The number is $2n$ for monounsaturated and cyclic-saturated refrigerants.

4.1.12 Bromine or iodine containing, propane-series isomers cannot be uniquely designated by this system.

5. DESIGNATION

5.2 Identification. Refrigerants shall be identified in accordance with Section 5.2.1, 5.2.2, or 5.2.3. Section 5.2.1 shall be used in technical publications (for international uniformity and to preserve archival consistency), on equipment nameplates, and in specifications. Section 5.2.2 can be used for single component halocarbon refrigerants, where distinction between the presence or absence of chlorine, ~~or~~ bromine or iodine is pertinent. Composition designation may be appropriate for nontechnical, public, and regulatory communications addressing compounds having environmental impact, such as ozone depletion or global warming potential. Section 5.2.3 can be used, under the same circumstances as Section 5.2.2, for blends (both azeotropic and zeotropic). Section 5.2.1 shall be used for miscellaneous organic and inorganic compounds.

5.2.2 Composition Designating Prefixes. The identifying number, as determined by Section 4, shall be prefixed by the letter “C” for carbon and preceded by “B,” “C,” ~~or~~ “F” or “I”—or a combination thereof in this sequence—to signify the presence of bromine, chlorine, or fluorine, or iodine respectively. Compounds that also contain hydrogen shall be further preceded by the letter “H” to signify the increased deterioration potential before reaching the stratosphere. The compositional designating prefixes for ether shall substitute an “E” for “C,” such that “HFE,” “HCFE,” and “CFE” refer to hydrofluoroethers, hydrochlorofluoroethers, and chlorofluoroethers, respectively.

Motion : XXX move to accept. YYY 2nd. X-0-0-Y-CNV (yes/no/abstain/absent – chair)

12 NEXT MEETINGS

NEXT CONFERENCE: June 23 -27 (2018), Houston, TX

D&N	Saturday, June 23	7:00 am – 10:00 am
Flammability	Saturday, June 23	10:00 am – 3:00 pm
Toxicology	Sunday, June 24	6:30 pm – 10:00 pm
SSPC 34	Monday, June 25	6:30 pm – 10:00 pm

Note: Follow-up teleconference for SSPC 34 members and interested parties will be scheduled.

ADJOURNMENT

Motion for Adjournment

Motion: Sonny