BSR/ASHRAE Addendum ah
to ANSI/ASHRAE Standard 34-2019

Public Review Draft

Proposed Addendum ah to Standard 34-2019, Designation and Safety Classification of Refrigerants

First Public Review (July 2022)
(Draft shows Proposed Changes to Current Standard)

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

This proposed addendum revises the composition tolerances for components of refrigerant blends.

Note: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.

Addendum ah to Standard 34-2019

Modify Section 4 as follows. The remainder of Section 4 remains unchanged.

4. NUMBERING OF REFRIGERANTS

[…]

4.4.2 Composition Tolerances. Blends shall have tolerances specified for individual components. Those tolerances shall be specified to the nearest 0.1% m/m. The maximum tolerance above or below the nominal shall not exceed 2.0% m/m. ~~The tolerance above or below the nominal shall not be less than 0.1% m/m.~~

The minimum tolerance above or below the nominal shall be:

a. 0.1% m/m for component, x, with concentration: $0.6\% \leq x \leq 16.6\%$ or $83.4\% \leq x \leq 99.4\%$

b. 0.2% m/m for component, x, with concentration: $16.7\% \leq x \leq 33.3\%$ or $66.7\% \leq x \leq 83.3\%$

c. 0.3% m/m for component, x, with concentration: $33.4\% \leq x \leq 66.6\%$

The difference between the highest and the lowest tolerances shall not exceed one-half of the nominal component composition.

Informative Note: Refer to Informative Appendix J, "Examples of Minimum Composition Tolerance," for examples.

[…]

Add new Informative Appendix J as shown.

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INFORMATIVE APPENDIX J—EXAMPLES OF MINIMUM COMPOSITION TOLERANCE

Section 4.4.2, "Composition Tolerances," requires that blend components have adjusted minimum tolerances based on the concentration in the blend. This is to maintain the integrity of the blend classification of the standard and to ensure that blends meet the stated tolerances. A reasonable estimate of measurement uncertainty by gas chromatography is ±0.25% of the reported value. Therefore, the minimum tolerance was determined to be 0.6% of the nominal concentration and rounded to the closest 0.1% m/m. This informative appendix provides examples to help visualize and clarify this requirement.

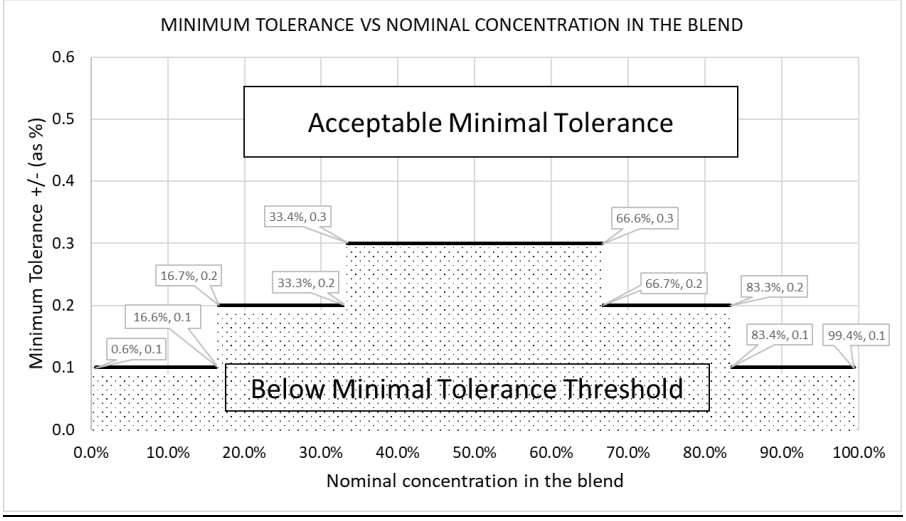

Figure J-1 Component minimum tolerance with respect to nominal concentration in the blend

Table J-1, "Tolerance of Refrigerant X," lists an example of ternary blend, refrigerant X, with proposed tolerances that do not meet the requirements of Section 4.4.2, Composition Tolerances." Note that Components A and C must have a minimum tolerance of 0.3% m/m; therefore, the proposed tolerance for Component A is unacceptable. Component B meets the minimum tolerance of 0.1% m/m; however, it must be defined in increments of 0.1% m/m.

Table J-1 Tolerance of Refrigerant X

Refrigerant X	Concentration (mass %)	Tolerance
Component A	40%	+0.2/–0.5
Component B	10%	+0.15/–0.15
Component C	50%	+0.5/–2.0

Table J-2, "Examples of Minimum Acceptable Tolerances," lists two additional examples, R-451A and R-410A. All components of the two blends have composition tolerances that meet the minimum acceptable tolerances.

Table J-2 Examples of Minimum Acceptable Tolerances

Refrigerant	Composition (mass %)	Composition Tolerances	Minimum Acceptable Tolerances
R-451A	R-1234yf/134a (89.8/10.2)	(±0.2/±0.2)	(+0.1,–0.1/+0.1,–0.1)
R-410A	R-32/125 (50.0/50.0)	(+0.5,–1.5/+1.5,–0.5)	(+0.3,–0.3/+0.3,–0.3)