



ADDENDA

**ANSI/ASHRAE Addendum ah to
ANSI/ASHRAE Standard 34-2022**

Designation and Safety Classification of Refrigerants

Approved by ASHRAE and the American National Standards Institute on October 31, 2022.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 180 Technology Parkway, Peachtree Corners, GA 30092. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

© 2022 ASHRAE

ISSN 1041-2336



ASHRAE Standing Standard Project Committee 34

Cognizant TC: 3.1, Refrigerants and Secondary Coolants

SPLS Liaison: Kathleen Owen

ASHRAE Staff Liaison: Ryan Shanley

Sarah Kim*, <i>Chair</i>	Mary E. Koban	Mark M. Olson*	Ankit Sethi*
Julie Majurin*, <i>Vice-Chair</i>	Tatsuro Kobayashi*	Michael Petersen	Kenji Takizawa*
Paul H. Dugard	Stephen Kujak*	Chun-cheng Piao	Douglas K. Tucker
Brian A. Fricke*	Andrew Kusmierz*	Gurunarayana Ravi	Asbjørn L. Vonsild
Sivakumar Gopalnarayanan*	Evan Laganis	George M. Rusch	William F. Walter
Danny M. Halel	Morgan E. Leehey	Ivan Rydkin	Greg Woyczynski
Joshua Hughes	Valerie P. Lisi	Marc Scancarello*	Samuel F. Yana-Motta
Harshad V. Inamdar	Bob Low	John P. Scott	
Gary W. Jepson*	Sandeep Mukhi	Christopher J. Seeton	
James G. Kendzel	WenBin Ng	John Senediak*	

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

ASHRAE STANDARDS COMMITTEE 2022–2023

Susanna S. Hanson, <i>Chair</i>	Phillip A. Johnson	Julie Majurin	Christopher J. Seeton
Jonathan Humble, <i>Vice-Chair</i>	Srinivas Katipamula	Lawrence C. Markel	Christian R. Taber
William P. Bahnfleth	Gerald J. Kettler	Margret M. Mathison	Paolo M. Tronville
Thomas E. Cappellin	Essam E. Khalil	Kathleen Owen	William F. Walter
Douglas D. Fick	Jay A. Kohler	Gwelen Paliaga	Steven C. Sill, <i>BOD ExO</i>
Patricia Graef	Cesar L. Lim	Karl L. Peterman	Sarah E. Maston, <i>CO</i>
Jaap Hogeling	Paul A. Lindahl, Jr.	Justin M. Prosser	
Jennifer A. Isenbeck	James D. Lutz	David Robin	

Connor Barbaree, *Senior Manager of Standards*

SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as “substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution.” Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

- interpretation of the contents of this Standard,
- participation in the next review of the Standard,
- offering constructive criticism for improving the Standard, or
- permission to reprint portions of the Standard.

DISCLAIMER

ASHRAE uses its best efforts to promulgate Standards and Guidelines for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines will be nonhazardous or free from risk.

ASHRAE INDUSTRIAL ADVERTISING POLICY ON STANDARDS

ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

(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

Addendum ah revises the composition tolerances for components of refrigerant blends.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum ah to Standard 34-2022

Modify Section 4 as shown. 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 as follows:

- 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.

(This appendix 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.)

INFORMATIVE APPENDIX J

EXAMPLES OF MINIMUM COMPOSITION TOLERANCE

Section 4.4.2 requires that blend components have different levels of 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 $\pm 0.25\%$ of the reported value. Therefore, the minimum tolerance was determined to be 0.6% of the nominal concentration or 0.6% of the sum of the nominal concentration of all other components, whichever is smaller, and rounded to the closest 0.1% m/m, no less than 0.1%. Component concentration ranges and corresponding minimum tolerance values are summarized in Section 4.4.2 and shown in Figure J-1. This informative appendix provides examples to help clarify this requirement.

Table J-1 lists an example of ternary blend, Refrigerant X, with proposed tolerances that do not meet the requirements of Section 4.4.2. 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-2 lists two additional examples, R-451A and R-410A. All components of the two blends have composition tolerances that meet the minimum acceptable tolerances.

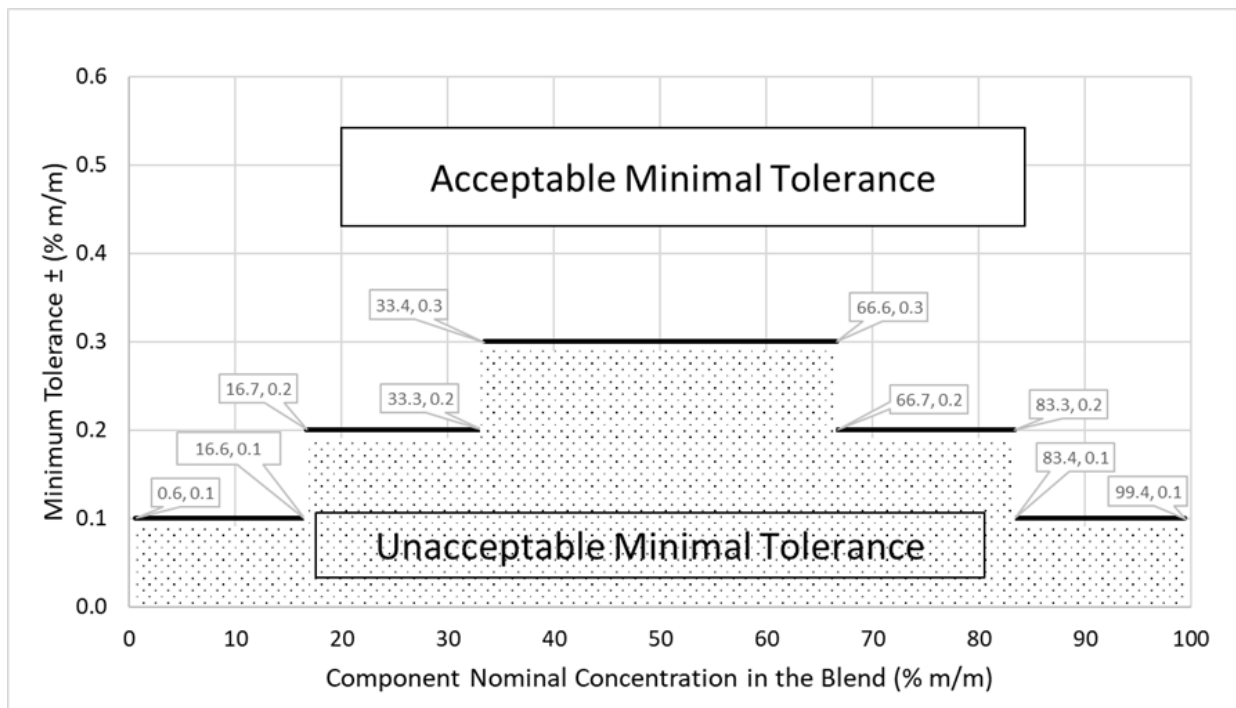


Figure J-1 Component minimum tolerance with respect to nominal concentration in the blend.

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

Refrigerant	Composition (mass %)	Composition Tolerances	Minimum Acceptable Tolerances
R-451A	R-1234yf/134a (89.8/10.2)	($\pm 0.2/\pm 0.2$)	(+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)

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

ASHRAE · 180 Technology Parkway · Peachtree Corners, GA 30092 · www.ashrae.org

About ASHRAE

Founded in 1894, ASHRAE is a global professional society committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields.

As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards, and connect on LinkedIn, Facebook, Twitter, and YouTube.

Visit the ASHRAE Bookstore

ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at www.ashrae.org/bookstore.

IMPORTANT NOTICES ABOUT THIS STANDARD

To ensure that you have all of the approved addenda, errata, and interpretations for this Standard, visit www.ashrae.org/standards to download them free of charge.

Addenda, errata, and interpretations for ASHRAE Standards and Guidelines are no longer distributed with copies of the Standards and Guidelines. ASHRAE provides these addenda, errata, and interpretations only in electronic form to promote more sustainable use of resources.