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).

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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 strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.

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 ±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.
Table J-1  Tolerance of Refrigerant X

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration (mass %)</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component A</td>
<td>40%</td>
<td>±0.2/–0.5</td>
</tr>
<tr>
<td>Component B</td>
<td>10%</td>
<td>±0.15/–0.15</td>
</tr>
<tr>
<td>Component C</td>
<td>50%</td>
<td>±0.5/–2.0</td>
</tr>
</tbody>
</table>

Table J-2  Examples of Minimum Acceptable Tolerances

<table>
<thead>
<tr>
<th>Refrigerant</th>
<th>Composition (mass %)</th>
<th>Composition Tolerances</th>
<th>Minimum Acceptable Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-451A</td>
<td>R-1234yf/134a (89.8/10.2)</td>
<td>(+0.2/+0.2)</td>
<td>(+0.1,–0.1/+0.1,–0.1)</td>
</tr>
<tr>
<td>R-410A</td>
<td>R-32/125 (50.0/50.0)</td>
<td>(+0.5,—1.5/+1.5,—0.5)</td>
<td>(+0.3,—0.3/+0.3,—0.3)</td>
</tr>
</tbody>
</table>

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

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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.

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