



ADDENDA

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

Designation and Safety Classification of Refrigerants

Approved by ASHRAE and the American National Standards Institute on April 28, 2023.

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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Cognizant TC: 3.1, Refrigerants and Secondary Coolants

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FOREWORD

Addendum g makes the following changes to better align Standard 34 with ISO 817, Refrigerants—Designation and safety classification:

- a. *Updates the definition of occupational exposure limit (OEL)*
- b. *Provides clarification for toxicity data*
- c. *Updates multiple requirements to apply for designations and safety group classifications for refrigerants*

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

Addendum g to Standard 34-2022

Modify Section 3.1 as shown. The remainder of Section 3 remains unchanged.

3.1 Defined Terms

[...]

occupational exposure limit (OEL): the time-weight average (TWA) concentration for a normal eight-hour workday and a 40-hour workweek to which nearly all workers can be repeatedly exposed without adverse effect. The OEL is generated by an independent organization that (a) is composed of health science experts without regard to nationality, (b) is experienced in generating OELs for refrigerant compounds, and (c) formally publishes the derived OELs in a way that is publicly accessible. ~~based on the OSHA PEL, ACGIH TLV-TWA, TERA OARS-WEEL, or consistent value.~~

Modify Section 4.3.2.3 as shown. The remainder of Section 4 remains unchanged.

4.3.2.3 ~~Even if~~ In those cases where only a single ~~propane~~ isomer exists for the hydrocarbon portion of the ether structure, such as CF₃-O-CF₂-CF₃, the suffix letters described in Section 4.1.10 shall be ~~omitted~~ retained. In this cited example, the correct designation shall be R-E218et.

Modify Section 6.1.5.1 as shown. The remainder of Section 6 remains unchanged.

6.1.5.1 Toxicity Classification. The chronic toxicity classification of a refrigerant blend is based on the nominal formulation. The OEL of mixtures upon which the safety classification is based shall be either

- a. calculated from the threshold limit values (TLVs) or workplace environmental exposure level (WEELs) of the individual components following American Conference of Governmental Industrial Hygienists guidelines ⁴ when toxicity data for the blend are not available, or
- b. based on refrigerant blend toxicity data and the requirements in Section 6.1.2 when toxicity data for the blend are available.

[...]

Modify Sections 9.5.2.2 and 9.5.2.3 as shown. The remainder of Section 9 remains unchanged.

9.5.2.2 Azeotropic Blends.

[...]

- j. ~~Latent heat of vaporization at 140°F (60°C)~~
- k. ~~Specific heat ratio of the vapor at 140°F (60°C)~~

[...]

9.5.2.3 Zeotropic Blends.

[...]

- g. ~~Latent heat of vaporization at 140°F (60°C)~~
- h. ~~Specific heat ratio of the vapor at 140°F (60°C)~~

Modify Normative Appendix B as shown. The remainder of Normative Appendix B remains unchanged.

NORMATIVE APPENDIX B

DETAILS OF TESTING—FLAMMABILITY

[...]

B1.5 Samples shall be introduced into the flammability test apparatus in the vapor phase in accordance with ASTM E681. Liquid samples of the refrigerant or blend composition to be tested shall be expanded into a suitable evacuated container such that only vapor under pressure is present. The vapors shall be introduced into the flammability test apparatus. Air shall then be added to the test apparatus. Measurement of the refrigerant-to-air concentration shall be by partial pressures. The refrigerant and air shall be mixed in the chamber for at least ~~five~~ two minutes. Activation of the ignition source shall commence within 60 to 90 seconds ~~30 to 60 seconds~~ of stirrer deactivation.

[...]

~~**B2.5 Leak/Recharge Testing.** Refrigerant blends containing flammable components shall be evaluated to determine the fractionation effects of successive leakage and recharging on the composition of the blend. A container shall be charged to 15% of the maximum fill (as defined in Section B2.4.1) with the WCF formulation of the refrigerant blend. A vapor leak at a rate of 2% by mass of the starting charge per hour shall be created and maintained at $73.4^{\circ}\text{F} \pm 5.4^{\circ}\text{F}$ ($23.0^{\circ}\text{C} \pm 3.0^{\circ}\text{C}$) until 20% of the starting charge has been leaked. When 20% leak is reached, the composition of the head space gas shall be determined by analysis. The container shall again be charged with the WCF to 15% of the maximum fill (as defined in Section B2.4.1), leaked, and measured in the above defined manner. The charge/leak cycle shall be conducted a total of five times. At the conclusion of the fifth leakage, the composition of the head space gas and liquid shall again be determined by gas chromatography.~~

[...]

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

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