



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

**Public Review Draft**

# **Proposed Addendum g to Standard 34-2022, Designation and Safety Classification of Refrigerants**

**First Public Review (March 2023)  
(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 updates the definition of occupational exposure limit (OEL), clarification for toxicity data, and several requirements to apply for designations and safety group classifications for refrigerants to better align with ISO 817, Refrigerants — Designation and safety classification.*

**Note:** This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (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 g to Standard 34-2022

***Modify Section 3 as follows. The remainder of Section 3 remains unchanged.***

## 3. NUMBERING OF REFRIGERANTS

### 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 (1) is composed of health science experts without regard to nationality, (2) is experienced in generating OELs for refrigerant compounds, and (3) 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 as follows. The remainder of Section 4 remains unchanged.***

## 4. NUMBERING OF REFRIGERANTS

**4.3.2.3** Even in those cases where only a single ~~propane~~ isomer exists for the hydrocarbon portion of the ether structure, such as CF<sub>3</sub>-O-CF<sub>2</sub>-CF<sub>3</sub>, the suffix letters described in Section 4.1.10 shall be ~~omitted~~ retained. In this cited example, the correct designation shall be R-E218~~ea~~.

[ ... ]

***Modify Section 6 as follows. The remainder of Section 6 remains unchanged.***

## 6. SAFETY GROUP CLASSIFICATIONS

[ ... ]

**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<sup>4</sup> 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 Section 9 as follows. The remainder of Section 9 remains unchanged.***

## 9. APPLICATION INSTRUCTIONS

[ ... ]

### 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 follows. 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°F ± 5.4°F (23.0°C ± 3.0°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.~~

[ ... ]