



# ADDENDA

**ANSI/ASHRAE Addendum e to  
ANSI/ASHRAE Standard 34-2016**

# Designation and Safety Classification of Refrigerants

Approved by the ASHRAE Standards Committee on June 23, 2017; by the ASHRAE Tech Council on June 28, 2017; and by the American National Standards Institute on June 29, 2017.

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**ASHRAE Standing Standard Project Committee 34**  
**Cognizant TC: 3.1, Refrigerants and Secondary Coolants**  
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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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## FOREWORD

Addendum e makes several changes with the intent to harmonize verbiage in ASHRAE Standard 34 and ISO 817, "Refrigerants—Designation and Classification," specifically in the use of "molar mass" versus "molecular mass."

**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 e to Standard 34-2016

Modify Section 3 as shown.

### 3. DEFINITIONS AND TERMS

**relative ~~molecular~~ molar mass:** the ratio of the mass of a molecule to 1/12 of that of carbon-12. The relative ~~molecular~~ molar mass is numerically equivalent to the molecular weight expressed in g/mol, but it is dimensionless.

Modify Section 4.6 as shown.

**4.6.1** For compounds with relative ~~molecular~~ molar masses less than 100, the number shall be the sum of 700 and the relative ~~molecular~~ molar mass, rounded to the nearest integer.

**4.6.2** For compounds with relative ~~molecular~~ molar masses equal to or greater than 100, the number shall be the sum of 7000 and the relative ~~molecular~~ molar mass, rounded to the nearest integer.

**4.6.3** When two or more inorganic refrigerants have the same relative ~~molecular~~ molar masses, uppercase letters (i.e., "A," "B," "C," etc.) shall be added, in serial order of designation, to distinguish among them.

Modify Section 7.4.1 as shown.

### 7.4 Units Conversion

#### 7.4.1 Mass per Unit Volume. [ . . . ]

$M =$  the ~~molecular~~ relative molar mass of the refrigerant in lb/mol (g/mol)

### 9.5.2 Refrigerant Data

Modify Section 9.5.2 as shown.

#### 9.5.2.1 Individual Compounds

[ . . . ]

d. ~~Molecular~~ Relative molar mass

[ . . . ]

#### 9.5.2.2 Azeotropic Blends

[ . . . ]

c. ~~Molecular~~ Relative molar mass as formulated

d. ~~Molecular~~ Relative molar mass of the saturated vapor at 140°F (60°C)

[ . . . ]

#### 9.5.2.3 Zeotropic Blends

[ . . . ]

b. ~~Molecular~~ Relative molar mass as formulated

c. ~~Molecular~~ Relative molar mass of the vapor at 140°F (60°C)

[ . . . ]

Modify Section B1.1 as shown.

### B1.1 Test Conditions

[ . . . ]

c. For those refrigerants that show flame propagation in accordance with step (a) or (b), flammability testing shall also be conducted at 73.4°F (23.0°C) and 14.7 psia (101.3 kPa) to determine the LFL. The LFL normally is expressed as refrigerant percentage by volume percent; multiply this by  $0.00041 \times$  ~~molecular~~ relative molar mass (g·mol) to obtain kg/m<sup>3</sup>, or by  $0.000026 \times$  ~~molecular~~ relative molar mass (g·mol) to obtain lb/ft<sup>3</sup>. For refrigerant blends, these tests shall be conducted on the WCF and the WCFF.

Modify Informative Appendix D as shown.

## INFORMATIVE APPENDIX D REFRIGERANT DATA

This appendix provides refrigerant data such as ~~molecular~~ relative molar mass and normal boiling point for the refrigerants listed. It also provides bubble points and dew points for zeotropic blends.

[ . . . ]

**TABLE D-1** TABLE D-1 Refrigerant Data ~~Molecular~~ Relative Molar Mass

**TABLE D-2** TABLE D-2 Data for Refrigerant Blends ~~Molecular~~ Relative Molar Mass



## **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.

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ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability. Through research, Standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today.

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