



# ADDENDA

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

# Designation and Safety Classification of Refrigerants

Approved by ASHRAE and the American National Standards Institute on September 29, 2023.

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**Cognizant TC: 3.1, Refrigerants and Secondary Coolants**

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## FOREWORD

*Addendum t adds the zeotropic refrigerant blend R-489A to Tables 4-2 and D-2, and adds or revises toxicity values for R-50, R-1150, and R-1270 to Tables 4-1 and E-1.*

**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 t to Standard 34-2022

#### *Modify Table 4-1 as shown.*

##### **Table 4-1 Refrigerant Data and Safety Classifications**

Refrigerant Number = 1150  
Chemical Name = ethene (ethylene)  
Chemical Formula = CH<sub>2</sub> = CH<sub>2</sub>  
OEL = 200 ppm v/v  
Safety Group = ~~B3A3~~  
LFL = 31,000 ppm v/v; 2.2 lb/1000 ft<sup>3</sup>; 36 g/m<sup>3</sup>  
BV = 80 cm/s  
Highly Toxic or Toxic Under Code Classification = Neither

#### *Modify Tables 4-2 and D-2 as shown.*

##### **Table 4-2 Data and Safety Classifications for Refrigerant Blends**

Refrigerant Number = ~~489~~A  
Composition (Mass %) = ~~R-50/1150/600~~ (1.5/22.0/76.5)  
Composition tolerances = ±0.3/±2.0/±2.0  
OEL = ~~410~~ ppm v/v  
Safety Group = ~~A3~~  
RCL = ~~1000~~ ppm v/v; 0.12 lb/1000 ft<sup>3</sup>; 1.9 g/m<sup>3</sup>  
LFL = ~~20,000~~ ppm v/v; 2.4 lb/1000 ft<sup>3</sup>; 38 g/m<sup>3</sup>  
Highly Toxic or Toxic Under Code Classification = Neither

##### **Table D-2 Data Classifications for Refrigerant Blends**

Refrigerant Number = ~~489~~A  
Composition (Mass %) = ~~R-50/1150/600~~ (1.5/22.0/76.5)  
Average Relative Molar Mass = 45.58 g/mol  
Bubble Point (°F) = -192.5  
Dew Point (°F) = 8.1  
Bubble Point (°C) = -124.7  
Dew Point (°C) = -13.3

**Modify Table E-1 as shown. The remainder of Table E-1 remains unchanged.**

(This appendix is not part of this standard. It is merely informative and does not contain requirements not 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 E  
TOXICITY AND FLAMMABILITY DATA FOR SINGLE-COMPOUND REFRIGERANTS**

**Table E-1 Toxicity Table for Standard 34—ATEL, ODL, FCL, and RCL Values for Single-Compound Refrigerants<sup>a</sup> (ppm v/v)**

Refrigerant R- <sup>b</sup>	Chemical Name	LC <sub>50</sub> <sup>c,d</sup>	Cardiac Sensitization		Anesthesia			Other <sup>i</sup>	ATEL	ODL	FCL	RCL	LFL	ATEL Source	RCL Source
			LOEL <sup>e</sup>	NOEL <sup>e</sup>	EC <sub>50</sub> <sup>f</sup>	LOEL <sup>g</sup>	NOEL <sup>h</sup>								
[...]															
50	<u>methane</u>	140,000 <sup>v</sup>		1000			140,000 <sup>v</sup>		1000	140,000			50,000	100% Cardiac NOEL	
[...]															
1150	<u>ethene (ethylene)</u>	57,000		1000			10,000		1000	140,000			31,000	100% Cardiac NOEL	
[...]															
1270	propene (propylene)	>490,000 <sup>t</sup>	ND	ND	ND	ND	10,000	<del>ND</del> 7200	1000	140,000	6700	1000	27,000	Sect 7.1.1 (b)	ATEL
[...]															

ND: None determined or not adequately defined according to criteria of this standard.

NA: Not applicable.

Note: The data shown in this table are rounded to three significant digits to avoid suggestion of artificial precision, but actual calculations used the data as published or converted to avoid propagation of errors in calculations, especially for blends. The ATEL and RCL concentrations are rounded to two significant figures.

[...]

v. Simple asphyxiant. Special case where no adjustment to the LC<sub>50</sub> or anesthesia value is needed. The ATEL for both mortality and anesthetic effects is equal to the ODL of 140,000 ppm.

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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.

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