ADDENDA

2015 Supplement

ANSI/ASHRAE Addenda a, b, c, d, e, f, g, h, i, j, k, l, m, n to
ANSI/ASHRAE Standard 34-2013

Designation and Safety Classification of Refrigerants

See Annex for approval dates.

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2015 Addenda Supplement to ANSI/ASHRAE Standard 34-2013, Designation and Safety Classification of Refrigerants

NOTE

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FOREWORD

This addendum adds new single-compound refrigerant R-1233zd(E), structural category "Unsaturated Organic Compounds," to Tables 4-1 and D-1.

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.

Addendum a to Standard 34-2013

Add the following underlined data to Tables 4-1 and D-1 in the columns indicated.

TABLE 4-1 Refrigerant Data and Safety Classifications

Refrigerant Number = 1233zd(E)
Chemical Name = trans-1-chloro-3,3,3-trifluoro-1-propene
Chemical Formula = $CF_3CH=CHCl$
OEL = 800
Safety Group = A1
RCL = 16,000 ppm v/v; 5.3 lb/Mcf; 85 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-1 Refrigerant Data

Refrigerant Number = 1233zd(E)
Chemical Name = trans-1-chloro-3,3,3-trifluoro-1-propene
Chemical Formula = $CF_3CH=CHCl$
Molecular Mass = 130.5
Normal Boiling Point = 64.6 °F; 18.1 °C

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FOREWORD

This addendum adds new zeotropic refrigerant R-446A to Tables 4-2 and D-2.

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.

Addendum b to Standard 34-2013

Add the following underlined data to Tables 4-2 and D-2 in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 446A
Composition (Mass %) = R-32/1234ze(E)/600 (68.0/29.0/3.0)
Composition tolerances = (+0.5, –1.0/+2.0, –0.6/+0.1, –1.0)
OEL = 960
Safety Group = A2L
RCL = 16,000 ppm v/v; 2.5 lb/Mcf; 39 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 446A
Composition (Mass %) = R-32/1234ze(E)/600 (68.0/29.0/3.0)
Average Molecular Mass = 62.0
Bubble Point (°F) = –56.9
Bubble Point (°C) = –49.4
Dew Point (°F) = –47.2
Dew Point (°C) = –44.0

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FOREWORD

This addendum adds new zeotropic refrigerant R-447A to Tables 4-2 and D-2.

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.

Addendum c to Standard 34-2013

Add the following underlined data to Tables 4-2 and D-2 in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 447A
Composition (Mass %) = R-32/125/1234ze(E) (68.0/3.5/28.5)
Composition tolerances = (+1.5, –0.5/+1.5, –0.5/+1.0, –1.0)
OEL = 900
Safety Group = A2L
RCL = 16,000 ppm v/v; 2.6 lb/Mcf; 42 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 447A
Composition (Mass %) = R-32/125/1234ze(E) (68.0/3.5/28.5)
Average Molecular Mass = 63.0
Bubble Point (°F) = –56.7
Bubble Point (°C) = –49.3
Dew Point (°F) = –47.6
Dew Point (°C) = –44.2

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FOREWORD

This addendum updates the Section 3 definitions for OEL and WEEL and updates the references in Section 10.

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.

Addendum d to Standard 34-2013

Revise Section 3 as follows.

occupational exposure limit (OEL): the time-weighted 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, based on the OSHA PEL, ACGIH TLV-TWA, ~~AIHA~~TERA OARS-WEEL, or consistent value.

workplace environmental exposure level (WEEL): an occupational exposure limit set by the ~~American Industrial Hygiene Association (AIHA)~~Toxicology Excellence for Risk Assessment (TERA) Occupational Alliance for Risk Science (OARS) (previously issued by American Industrial Hygiene Association [AIHA]).[5] The TWA concentration, measured in the worker breathing zone, for a normal eight-hour workday and 40-hour workweek for which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. OARS-WEEL values may be expressed as time-weighted average TWA concentrations, short-term exposure levels (STELs), or ceiling values.

Revise Section 9.6.2 as follows.

9.6.2 Chronic Toxicity. For single-compound refrigerants or for each component of blends and for the blend itself, applications shall include the following with identified sources:

a. a. Repeat exposure toxicity data if available
b. b. ACGIH TLV-TWA or TLV-C if assigned
c. c. ~~AIHA~~TERA OARS-WEEL if assigned
d. d. OSHA PEL if assigned; otherwise, a recommended exposure value, determined on a consistent basis, with an explanation of how it was determined

Revise Section 10 as follows.

1. *International Fire Code* (IFC), International Code Council, Fairfax, VA, section ~~3702~~202, ~~2003~~2013.
2. ~~*Uniform Fire Code* (UFC), Western Fire Chiefs Association, Walnut Creek, CA, sections 209 and 221, 2000~~NFPA 1, Fire Code, National Fire Protection Association, Quincy, Massachusetts, section 3.3.173.6, 2012.
3. *Health Hazard ~~Definitions~~Criteria (Mandatory)*, Occupational Safety And Health Administration (OSHA), US Department of Labor, 29 Code of Federal Regulations (CFR) 1910.1200 Subpart Z Appendix A, US Government Printing Office, Washington, DC, ~~2009~~2012.
4. *~~2010~~2013 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, American Conference of Governmental Industrial Hygienists, Cincinnati, OH, ~~2010~~2013.
5. ~~*AIHA 2011 Emergency Response Planning Guidelines and Workplace Environmental Exposure Level Handbook*, document AEAH11-559, American Industrial Hygiene Association (AIHA), Fairfax, VA, USA, 2011~~. TERA/OARS WEEL Table, www.tera.org/oars/WEEL.html, Toxicology Excellence for Risk Assessment (TERA), Occupational Alliance for Risk Science (OARS), Cincinnati, OH. (WEELS were previously issued by the American Industrial Hygiene Association [AIHA]).
6. J.M. Calm, "Composition Designations for Refrigerants," *ASHRAE Journal*, Vol. 31, No. 11, pp. 48-51, November 1989.
7. ASTM E681-2009, *Standard Test Method for Concentration Limits of Flammability of Chemicals (Vapors and Gases)*, American Society of Testing and Materials, West Conshohocken, PA, 2009.
8. Jabbour, T., Flammable refrigerant classification based on the burning velocity. PhD Thesis, Ecole des Mines: Paris, France, 2004.
9. Jabbour, T. and Clodic, D.F., Burning velocity and refrigerant flammability classification. *ASHRAE Transactions* 110(2), 2004.
10. *ANSI/ASHRAE Standard 15-~~2010~~2013, Safety Standard for Refrigeration Systems.* American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, GA.
11. *OECD Principles of Good Laboratory Practice, Annex 2 of Decision C(81)30(Final),* Organization for Economic Co-operation and Development (OECD), Paris, France, 13 May, 1981 as revised through 1999.
12. *Good Laboratory Practice for Nonclinical Laboratory Studies, Food and Drug Administration (FDA), 21 CFR Chapter 1 Part 58, Subparts A-K,* Government Printing Office, Washington, DC, 1 April ~~2009~~2013.
13. *Good Laboratory Practice Standards,* Environmental Protection Agency, 40 CFR Part 792, Subparts A-J, Government Printing Office, Washington, DC, 1 July ~~2007~~2011.
14. *GLP for Industrial Chemicals*, Kikyoku [Basic Industries Bureau] Dispatch 85, Ministry of International Trade and Industry (MITI), and Kanpogyo [Planning and Coordination Bureau] Dispatch 39, Environmental Agency, Tokyo, Japan, 31 March 1984.
15. *A Guide to IUPAC Nomenclature of Organic Compounds (Recommendations 1993).* R. Panico, W.H. Powell, and J.-C. Richer. Blackwell Scientific Publications, 1993. www.acdlabs.com/iupac/nomenclature/.
16. IUPAC. www.iupac.org. Research Triangle Park, NC: International Union of Pure and Applied Chemistry.

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-448A to Tables 4-2 and D-2.

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.

Addendum e to Standard 34-2013

Modify Tables 4-2 and D-2 as follows in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 448A
Composition (Mass %) = R-32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)
Composition tolerances = +0.5, –2.0/+2.0, –0.5/+0.5, –2.0/+2.0, –1.0/+0.5, –2.0
OEL = 890
Safety Group = A1
RCL = 110,000 ppm v/v; 24 lb/Mcf; 390 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 448A
Composition (Mass %) = R-32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)
Average Molecular Mass = 86.3
Bubble Point (°F) = –50.6
Dew Point (°F) = –39.6
Bubble Point (°C) = –45.9
Dew Point (°C) = –39.8

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-449A to Tables 4-2 and D-2.

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Addendum f to Standard 34-2013

Modify Tables 4-2 and D-2 as follows in the columns indicated.

TABLE 4-2 DATA AND SAFETY CLASSIFICATIONS FOR REFRIGERANT BLENDS

Refrigerant Number = 449A
Composition (Mass %) = R-32 /125 /1234yf /134a (24.3/24.7/25.3/25.7)
Composition tolerances = +0.2, –1.0/+1.0, –0.2/+0.2, –1.0/+1.0, –0.2
OEL = 830
Safety Group = A1
RCL = 100,000 ppm v/v; 23 lb/Mcf; 370 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 DATA FOR REFRIGERANT BLENDS

Refrigerant Number = 449A
Composition (Mass %) = R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)
Average Molecular Mass = 87.2
Bubble Point (°F) = –50.8
Dew Point (°F) = –39.8
Bubble Point (°C) = –46.0
Dew Point (°C) = –39.9

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-450A to Tables 4-2 and D-2.

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.

Addendum g to Standard 34-2013

Modify Tables 4-2 and D-2 as follows in the columns indicated.

TABLE 4-2 DATA AND SAFETY CLASSIFICATIONS FOR REFRIGERANT BLENDS

Refrigerant Number = 450A
Composition (Mass %) = R-134a/1234ze(E) (42.0/58.0)
Composition tolerances = ±2.0/±2.0
OEL = 880
Safety Group = A1
RCL = 72,000 ppm v/v; 20 lb/Mcf; 320 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 DATA FOR REFRIGERANT BLENDS

Refrigerant Number = 450A
Composition (Mass %) = R-134a/1234ze(E) (42.0/58.0)
Average Molecular Mass = 108.7
Bubble Point (°F) = –10.1
Dew Point (°F) = –9.0
Bubble Point (°C) = –23.4
Dew Point (°C) = –22.8

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-444B to Tables 4-2 and D-2.

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.

Addendum h to Standard 34-2013

Modify Tables 4-2 and D-2 as follows in the columns indicated.

TABLE 4-2 DATA AND SAFETY CLASSIFICATIONS FOR REFRIGERANT BLENDS

Refrigerant Number = 444B
Composition (Mass %) = R-32/152a/1234ze(E) (41.5/10.0/48.5)
Composition tolerances = ±1.0/±1.0/±1.0
OEL = 890
Safety Group = A2L
RCL = 23,000 ppm v/v; 4.3 lb/Mcf; 69 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 DATA FOR REFRIGERANT BLENDS

Refrigerant Number = 444B
Composition (Mass %) = R-32/152a/1234ze(E) (41.5/10.0/48.5)
Average Molecular Mass = 72.8
Bubble Point (°F) = –48.3
Dew Point (°F) = –30.8
Bubble Point (°C) = –44.6
Dew Point (°C) = –34.9

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FOREWORD

This addendum revises Section 9.9.5 to change the quantity and type of documents applicants should submit to ASHRAE.

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Addendum i to Standard 34-2013

Revise Section 9.9.5 as follows.

9.9.5 Quantity. A PDF or word-searchable electronic file and an unbound copy of the application shall be provided to the ASHRAE Manager of Standards. A scanned PDF file is acceptable for figures and other inserts. A bound copy will only be provided if a committee member or staff member requests it.~~Thirty-five compact discs with the application in electronic format shall be provided. In addition, a maximum of 35 bound copies may be required for committee and administrative use (contact the ASHRAE Manager of Standards for the exact number of hard copies required). The electronic format shall be an electronically searchable PDF file of minimal size. A scanned PDF file is acceptable for figures and other inserts. Committee members may request only the compact discs, thereby reducing the number of bound paper copies required.~~

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-451A to Tables 4-2 and D-2. The recommended flammability classification 2L is based on an LFL of 7.0 vol. %, a heat of combustion of 9790 kJ/kg (4209 Btu/lb), and a burning velocity less than 4 cm/s. The recommended toxicity classification A is based on an adopted OEL of 520 ppm v/v. The recommended ATEL is 100,000 ppm v/v.

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.

Addendum j to Standard 34-2013

Add the following underlined data to Table 4-2 and Table D-2 in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 451A
Composition (Mass %) = R-1234yf/134a (89.8/10.2)
Composition tolerances = ±0.2/±0.2
OEL (ppm v/v) = 520
Safety Group = A2L
RCL = 18,000 ppm v/v; 5.3 lb/Mcf; 81 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 451A
Composition (Mass %) = R-1234yf/134a (89.8/10.2)
Average Molecular Mass = 112.7
Bubble Point (°F) = –23.4
Dew Point (°F) = –22.9
Bubble Point (°C) = –30.8
Dew Point (°C) = –30.5

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-451B to Tables 4-2 Table D-2. The recommended flammability classification 2L is based on an LFL of 7.0 vol. %, a heat of combustion of 9790 kJ/kg (4209 Btu/lb), and a burning velocity less than 4 cm/s. The recommended toxicity classification A is based on an adopted OEL of 530 ppm v/v. The recommended ATEL is 100,000 ppm v/v.

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.

Addendum k to Standard 34-2013

Add the following underlined data to Table 4-2 and Table D-2 in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 451B
Composition (Mass %) = R-1234yf/134a (88.8/11.2)
Composition tolerances = ±0.2/±0.2
OEL (ppm v/v) = 530
Safety Group = A2L
RCL = 18,000 ppm v/v; 5.3 lb/Mcf; 81 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 451B
Composition (Mass %) = R-1234yf/134a (88.8/11.2)
Average Molecular Mass = 112.6
Bubble Point (°F) = –23.8
Dew Point (°F) = –23.1
Bubble Point (°C) = –31.0
Dew Point (°C) = –30.6

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FOREWORD

This addendum adds the azeotropic refrigerant blend R-513A to Tables 4-2 and D-2. The recommended flammability classification is 1. The recommended toxicity classification A is based on an adopted OEL of 650 ppm v/v. The recommended ATEL is 72,000 ppm v/v.

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.

Addendum l to Standard 34-2013

Add the following underlined data to Table 4-2 and Table D-2 in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 513A
Composition (Mass %) = R-1234yf/134a (56.0/44.0)
Composition tolerances = ±1.0/±1.0
OEL (ppm v/v) = 650
Safety Group = A1
RCL = 72,000 ppm v/v; 20 lb/Mcf; 320 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 513A
Composition (Mass %) = R-1234yf/134a (56.0/44.0)
Azeotropic Temperature: 27.0°C (80.6°F)
Azeotropic Molecular Mass = 108.4
Normal Boiling Point: –29.2°C (–20.6°F)

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FOREWORD

This addendum adds the zeotropic refrigerant blend R-452A to Tables 4-2 and D-2.

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.

Addendum m to Standard 34-2013

Add the following underlined data to Table 4-2 and Table D-2 in the columns indicated.

TABLE 4-2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 452A
Composition (Mass %) = R-32/125/1234yf (11.0/59.0/30.0)
Composition tolerances = ±1.7/±1.8/+0.1,–1.0
OEL (ppm v/v) = 780
Safety Group = A1
RCL = 10,000 ppm v/v; 27 lb/Mcf; 440 g/m^3
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-2 Data for Refrigerant Blends

Refrigerant Number = 452A
Composition (Mass %) = R-32/125/1234yf (11.0/59.0/30.0)
Average Molecular Mass = 103.5 g/mol
Bubble Point (°F): –52.6
Dew Point (°F) –45.8
Bubble Point (°C): –47.0
Dew Point (°C): –43.2

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FOREWORD

This addendum modifies Section 6.1.3, "Flammability Classification," on required validation tests for burning velocity measurement.

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.

Addendum n to Standard 34-2013

Change Section 6.1.3 as shown.

[. . .]

Burning velocity measurements shall be conducted according to a credible method. The method shall be in agreement with established methods of determining burning velocity by demonstrating measurement results of 6.7 ± 0.7 cm/s burning velocity for R-32 ~~and 23.0 +/- 2.3 cm/s for R-152a, or by presenting other evidence supporting the accuracy of the method~~. When the burning velocity of the proposed refrigerant is above 6.7 cm/s, an additional test shall be required demonstrating the burning velocity for R-152a of 23.0 ± 2.3 cm/s to validate the method, or by presenting other evidence supporting the accuracy of the method. One acceptable method is the vertical-tube method as detailed by Jabbour and summarized by Jabbour and Clodic.[8,9] Measurements shall be conducted starting from the LFL to at least 125% of the stoichiometric concentration. Measurements shall be done with increments of, at most, 10% of the stoichiometric concentration, and each measurement shall be repeated at least two times. The burning velocity is the maximum value obtained from a least square-fit to the measure data.

(This annex is not part of these 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 ANNEX
18-MONTH SUPPLEMENT—ADDENDA TO ANSI/ASHRAE STANDARD 34-2013

This 18-month supplement includes Addenda a, b, c, d, e, f, g, h, i, j, k, l, m, and n to ANSI/ASHRAE Standard 34-2013. The following table lists each addendum and describes the way in which the standard is affected by the change. It also lists the ASHRAE and ANSI approval dates for each addendum.

Addendum	Section(s) Affected	Description of Changes[a]	ASHRAE Approval	ANSI Approval
a	Tables 4-4 and D-1	Adds new single-compound refrigerant R-1233zd (E), structural category "Unsaturated Organic Compounds," to Tables 4-1 and D-1.	1/22/14	1/23/14
b	Tables 4-2 and D-2	Adds new zeotropic refrigerant R-446A to Tables 4-2 and D-2.	1/22/14	1/23/14
c	Tables 4-2 and D-2	Adds new zeotropic refrigerant R-447A to Tables 4-2 and D-2.	1/22/14	1/23/14
d	3; 10	Updates the Section 3 definitions for OEL and WEEL and updates the references in Section 10.	7/2/14	7/3/14
e	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-448A to Tables 4-2 and D-2.	7/2/14	7/3/14
f	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-449A to Tables 4-2 and D-2.	7/2/14	7/3/14
g	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-450A to Tables 4-2 and D-2.	7/2/14	7/3/14
h	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-444B to Tables 4-2 and D-2.	7/2/14	7/3/14
i	9.9.5	Revises Section 9.9.5 to change the quantity and type of documents applicants should submit to ASHRAE.	7/2/14	7/3/14
j	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-451A to Tables 4-2 and D-2. The recommended flammability classification 2L is based on an LFL of 7.0 vol. %, a heat of combustion of 9790 kJ/kg (4209 Btu/lb), and a burning velocity less than 4 cm/s. The recommended toxicity classification A is based on an adopted OEL of 520 ppm v/v. The recommended ATEL is 100,000 ppm v/v.	1/28/15	1/29/15
k	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-451B to Tables 4-2 and D-2. The recommended flammability classification 2L is based on an LFL of 7.0 vol. %, a heat of combustion of 9790 kJ/kg (4209 Btu/lb), and a burning velocity less than 4 cm/s. The recommended toxicity classification A is based on an adopted OEL of 530 ppm v/v. The recommended ATEL is 100,000 ppm v/v.	1/28/15	1/29/15
l	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-513A to Tables 4-2 and D-2. The recommended flammability classification is l. The recommended toxicity classification A is based on an adopted OEL of 650 ppm v/v. The recommended ATEL is 72,000 ppm v/v.	1/28/15	1/29/15
m	Tables 4-2 and D-2	Adds the zeotropic refrigerant blend R-452A to Tables 4-2 and D-2.	1/28/15	1/29/15
n	6.1.3	Modifies Section 6.1.3, "Flammability Classification," on required validation tests for burning velocity measurement.	1/28/15	1/29/15

*These descriptions may not be complete and are provided for information only.

NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE website at http://www.ashrae.org.

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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About ASHRAE

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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