

**ANSI/ASHRAE Addenda i, j, k, l, n, and o to
ANSI/ASHRAE Standard 34-2010**



ASHRAE ADDENDA

Designation and Safety Classification of Refrigerants

Approved by the ASHRAE Standards Committee on June 25, 2011; by the ASHRAE Board of Directors on June 29, 2011; and by the American National Standards Institute on June 30, 2011.

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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- c. offering constructive criticism for improving the Standard, or
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FOREWORD

This addendum adds new refrigerant 1234ze(E) to Table 1 and Table D1.

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

Addendum i to Standard 34-2010

Add the following underlined data to Table 1 and Table D1 in the columns indicated.

TABLE 1 Refrigerant Data and Safety Classifications

Refrigerant Number = 1234ze(E)

Chemical Name = trans-1,3,3,3-tetrafluoro-1-propene

Chemical Formula = CF₃CH=CHF

OEL = 800

Safety Group = A2L

RCL = 16,000 ppm v/v; 75 g/m³; 4.7 Mcf

Highly Toxic or Toxic Under Code Classification = Neither

TABLE D-1 Refrigerant Data

Refrigerant Number = 1234ze(E)

Chemical Name = trans-1,3,3,3-tetrafluoro-1-propene

Chemical Formula = CF₃CH=CHF

Molecular Mass = 114.0

Normal Boiling Point = -19.0°C; -2.2°F

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FOREWORD

This addendum adds new azeotropic refrigerant 511A to Table 2 and Table D2.

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

Addendum j to Standard 34-2010

Add the following underlined data to Table 2 and Table D2 in the columns indicated.

TABLE 2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 511A
Composition (Mass %) = R-290/E170 (95.0/5.0)
Composition Tolerances = (±1.0/± 1.0)
OEL = 1000
Safety Group = A3
RCL = 5,300 ppm v/v; 9.5 g/m³; 0.59 lb/Mcf
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D2 Data for Refrigerant Blends

Refrigerant Number = 511A
Composition (Mass %) = R-290/E170 (95.0/5.0)
Composition Tolerances = (±1.0/± 1.0)
Azeotropic Temperature (°C) = -20 to 40
Azeotropic Temperature (°F) = -4 to 104
Azeotropic Molecular Mass = 44.19
Normal BPt. (°C) = -42.1
Normal BPt. (°F) = -43.7

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FOREWORD

This addendum deletes the provisional status of RCL values for refrigerants 14, 115, 170, C318, 1270, 405A, 416A, 417A, 424A, 426A, and 504 and deletes footnote d in Table 1 and footnote e in Table 2.

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

Addendum k to Standard 34-2010

In Table 1, delete footnote d and remove the footnote d designation from refrigerants 14, 115, 170, C318, and 1270.

In Table 2, delete footnote e and remove the footnote e designation from refrigerants 405A, 416A, 417A, 424A, 426A, and 504.

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these changes are more recent acceptable GLP methodology. RCL values for refrigerants containing R-32 are subsequently changed in Table 2.

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

FOREWORD

This addendum changes the cardiac sensitization NOEL from 200,000 ppm to 350,000 ppm and deletes the LOEL value of 250,000 ppm for R-32 in Table E1. The bases for

Addendum I to Standard 34-2010

Make the changes to Tables 2 and E1 as indicated.

TABLE 2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number	Composition (Mass %)	RCL ^a		
		(ppm v/v)	(g/m ³)	(lb/Mcf)
407A	R-32/125/134a (20.0/40.0/40.0)	78,000 <u>83,000</u>	290 <u>300</u>	18 <u>19</u>
407B	R-32/125/134a (10.0/70.0/20.0)	77,000 <u>79,000</u>	320 <u>330</u>	20 <u>21</u>
407C	R-32/125/134a (23.0/25.0/52.0)	76,000 <u>81,000</u>	270 <u>290</u>	17 <u>18</u>
407D	R-32/125/134a (15.0/15.0/70.0)	65,000 <u>68,000</u>	240 <u>250</u>	15 <u>16</u>
407E	R-32/125/134a (25.0/15.0/60.0)	75,000 <u>80,000</u>	260 <u>280</u>	16 <u>17</u>
407F	R-32/125/134a (30.0/30.0/40.0)	87,000 <u>95,000</u>	290 <u>320</u>	18 <u>20</u>
410A	R-32/125 (50.0/50.0)	130,000 <u>140,000</u>	390 <u>420</u>	25 <u>26</u>
410B	R-32/125 (45.0/55.0)	130,000 <u>140,000</u>	390 <u>430</u>	24 <u>27</u>
425A	R-32/134a/227ea (18.5/69.5/12.0)	67,000 <u>72,000</u>	250 <u>260</u>	16
427A	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	76,000 <u>79,000</u>	280 <u>290</u>	18
438A	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	19,000 <u>20,000</u>	79	4.9
504	R-32/115 (48.2/51.8)	140,000	460 <u>450</u>	29 <u>28</u>

TABLE E1 Toxicity Table for Standard 34—ATEL, ODL, FCL, and RCL Values for Single-Compound Refrigerants (ppm v/v)

Refrigerant R ^b	Cardiac Sensitization		ATEL	RCL
	LOEL ^c	NOEL ^c		
32	250,000 <u>ND</u>	200,000 <u>350,000</u>	200,000	36,000

ND: None Determined or Not Adequately Defined according to criteria of this standard.

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FOREWORD

This addendum adds “pressure at the critical point” to subclauses 9.5.2.1, 9.5.2.2, and 9.5.2.3 and modifies subclause 9.5.2.5.

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

Addendum n to Standard 34-2010

Make the following additions to subclauses 9.5.2.1, 9.5.2.2, 9.5.2.3 and 9.5.2.5 and renumber the lists accordingly.

9.5.2.1 Individual Compounds. The following information shall be provided for single-compound refrigerants or for each component of blends:

- g. Temperature at the critical point
- h. Pressure at the critical point
- ~~h~~i. Specific volume at the critical point

9.5.2.2 Azeotropic Blends. The following additional information shall be provided for azeotropes:

- l. Temperature at the critical point
- m. Pressure at the critical point
- ~~m~~n. Specific volume at the critical point

9.5.2.3 Zeotropic Blends. The following additional information shall be provided for zeotropes:

- i. Temperature at the critical point
- j. Pressure at the critical point
- ~~j~~k. Specific volume at the critical point

9.5.2.5 Critical Point for Blends. For refrigerant blends, in the absence of experimental data, the critical temperature and pressure shall be calculated as the weighted average by mole fractions of the critical temperatures and pressures, respectively, of the blend components in the as-formulated composition.

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FOREWORD

This addendum clarifies the requirements of clause B1.

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Addendum o to Standard 34-2010

Revise section B.1 as follows.

B1. FLAMMABILITY TESTING

Flammability tests shall be conducted in accordance with ASTM E681.⁶ For classification of class 2 or class 1 materials, testing shall be in a nominal 12 L (0.424ft³) spherical glass flask ~~The test vessel size shall be a nominal 12 L (0.424 ft³) spherical glass flask~~ (see Figure B.1).

**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.

