

ANSI/ASHRAE Addenda 34a-34f
ANSI/ASHRAE Addendum 34h
ANSI/ASHRAE Addenda 34j-34l
ANSI/ASHRAE Addenda 34o-34p
Addenda to ANSI/ASHRAE Standard 34-1997



ASHRAE[®] STANDARD

Addenda to **Designation and Safety Classifications of Refrigerants**

The ASHRAE Standards Committee approved Standard 34 Addenda *a, b, c, d, e, and f* on January 17, 1998; Addenda *h, j, and k* on February 5, 2000; and Addenda *l, o, and p* on June 24, 2000. The ASHRAE Board of Directors approved Standard 34 Addenda *a, b, c, d, e, and f* on January 22, 1998; Addenda *h, j, and k* on February 10, 2000; and Addenda *l, o, and p* on June 29, 2000. The American National Standards Institute approved Standard 34 Addenda *a, b, c, d, e, and f* on February 5, 1999; Addenda *h, j, and k* on April 25, 2000; and Addenda *l, o, and p* on November 15, 2000.

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(This foreword is not part of this addenda but is included for information purposes only.)

FOREWORD

The purposes of these addenda to ANSI/ASHRAE 34-1997 are:

- 34a—to delete some refrigerants from Table 1 to simplify the table. Most of those deleted were never used as refrigerants and the basis for their original inclusion is not apparent. Some of those deleted were used at one time but no longer. The philosophy of the cleanup is to limit the standard's focus to refrigerants remaining in use in installed systems, in current use, or likely to come into future use.

As an information item, some chemical formulas are also edited to be consistent with IUPAC conventions and to correct editorial error. The asterisk indicates where these chemical formulae have been changed. Also, the preferred name for R-600a has been changed from 2-methyl propane to isobutane; isobutane is the IUPAC name as one of the retained exceptions.

- 34b—to modify Table 2 by adding R-413A and footnote q as shown.
- 34c—to modify Tables 1 and 2 by deleting the safety classifications of R-C318 and of R-405A, which contains R-C318. The safety classifications are being deleted because of a lack of toxicity data for R-C318, as specified in Subsection 8.6 of the standard.
- 34d—to delete subsection 8.8 of the standard, which addresses the recommended hazard signals in accordance with NFPA 704.
- 34e—to modify Table 1 by adding R-236fa.
- 34f—to modify Table 2 by adding R-407E and footnote r.
- Addendum h—Classification of R-245fa (with editorial changes to Table 1).
- Addendum j—Modification of toxicity information requirements in Section 8 (with one editorial change).
- Addendum k—Modification of the language in Section 8 to delete the evidence of the commercialization requirement.
- Addendum l—to add R-414A designation, safety classification, and tolerances to Table 2.
- Addendum m—to add R-414B designation, safety classification, and tolerances to Table 2.
- Addendum o—To clarify the minimum requirements for acceptable sources of toxicity information for requests for refrigerant designation and safety classification. This guidance will enable applicants to adequately document toxicity information in their applications and provide project committee members consistent guidance for acceptable sources of that information. Text presented in this addendum incorporates prior changes in 8.6, which were implemented by ANSI/ASHRAE Addendum 34j-2000 to ANSI/ASHRAE Standard 34-1997. Addendum p—to modify 6.1.5 to replace the dual safety classification with a single safety classification and editorially modify safety classifications in Table 2 and Table B1. ANSI/ASHRAE Standard 15-1994 uses only

the safety classification for the worst case of fractionation for refrigerant blends and does not use the as formulated safety classification. Eliminating the dual safety classification is designed to reduce the level of confusion and make safety classifications of this standard consistent with ANSI/ASHRAE Standard 15-1994 practice.

The revised Table 2 incorporates prior changes implemented by all addenda of the standard.

Addendum 34a

Revise Table 1 as shown.

Addenda 34b and 34f

Revise Table 2 as shown to add refrigerants R-413A and R-407E and footnotes q and r.

Addendum 34c

In Table 1, delete “A1” from the safety group listing for C318. In Table 2, delete “A1/A1” from the safety group listing for 405A as shown.

Addendum 34d

~~8.8 Other Safety Information. Applications shall include the recommended Hazard Signals in accordance with NFPA 704.~~

Addendum 34e

In Table 1, add R-236fa as shown.

Addendum h

In Table 1, add R-245fa and its footnote as shown, and modify R-236fa as shown.

Addendum j

Amend the following paragraphs as shown (strike through indicates deletion; double underline indicates addition):

8.6 Toxicity Information. Applications ~~for single compound refrigerants~~ shall include the data identified in 8.6.1, 8.6.2, and 8.6.3. ~~Applications for refrigerant blends shall include the data identified in 8.6.3.~~ The sources for these data shall be identified, and the applicant shall provide copies if requested by the committee. See 8.1.6 regarding blend components.

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

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

Addendum k

Delete sections 8.5.3, 8.5.3.1, 8.5.3.2, and 8.5.3.3 without replacement.

~~**8.5.3 Evidence of Commercialization**—Evidence of commercialization shall be provided for blends to demonstrate eligibility for assignment of a designation in accordance with 4.4.1 or 4.4.2. This evidence shall satisfy 8.5.3.1, 8.5.3.2, or 8.5.3.3 and shall be supported by copies of announcements or product literature in an appendix or appendices. References to blends under 8.5.3.1, 8.5.3.2, and 8.5.3.3 must identify the specific formulation or provided supplementary documentation of the specific formulation rather than a trade name.~~

~~**8.5.3.1 Ordinary Use**—Commercialization may be established with evidence that the refrigerant blend is readily available for purchase by any qualified purchaser of refrigerants and that the refrigerant is in actual use in ordinary (not laboratory or developmental) installations.~~

~~**8.5.3.2 Available and Accepted**—Commercialization also may be established with evidence that a chemical manufacturer has publicly announced the availability of, or commitment to commercialize, the refrigerant blend in reasonable quantities and that an equipment manufacturer has publicly announced intent to use the refrigerant blend in a commercial product and/or approves use of the blend in servicing equipment of its own manufacture.~~

~~**8.5.3.3 Commercial Sales**—Commercialization also may be established from evidence that quantities exceeding 4,500 kg (10,000 lb) have been sold for use as a refrigerant in any 12-month period.~~

Addendum l

Revise Table 2 as shown to add refrigerant R-414A and footnote s.

Addendum o

8.6 Toxicity Information. Applications shall include the data identified in 8.6.1, 8.6.2, and 8.6.3. The sources for these data shall be identified, and the applicant shall provide copies if requested by the committee. See 8.1.6 regarding blend com-

ponents. The identified sources shall describe the test methods, specimens, and materials used and also document clinical observations and the test results. The documentation must indicate compliance with Good Laboratory Practices (GLP) in accordance with reference 7, 8, 9, or 10 for toxicity tests since 1985. Data from peer-reviewed publications, including journal articles, reports, and assessments, also are allowed provided that they demonstrate examination of the same information. Material Safety Data Sheets (MSDSs), Hygiene Standard Sheets, manufacturers' product literature, and databases are not acceptable as sources of toxicity information for this section.

Addendum p

Revise Table 2 and Table B1 as shown to implement single safety classification as prescribed below:

6.1.5 Safety Classification of Refrigerant Blend. Blends, whether zeotropic or azeotropic, whose flammability and/or toxicity characteristics may change as the composition changes during fractionation, shall be assigned a dual safety group classification, with the two classifications separated by a slash (/). Each of the two classifications shall be determined according to the same criteria as a single component refrigerant (see 6.1.2) and 6.1.3). The first classification listed shall be the classification of the as formulated composition of the blend. The second classification listed shall be the classification of the blend composition at the worst case of fractionation. safety group classification based on the worst case of fractionation. This classification shall be determined according to the same criteria as a single-compound refrigerant.

For flammability, “worst case of fractionation” is defined as the composition during fractionation that results in the highest concentration of flammable component(s) in the vapor or liquid phase. For toxicity, “worst case of fractionation” is defined as the composition during fractionation that results in the highest concentration of the component(s) in the vapor or liquid phase for which the TLV-TWA is less than 400 ppm by volume. The TLV-TWA for a specific blend composition shall be calculated from the TLV-TWA of the individual components (Appendix C of Reference 4).

TABLE 1
Refrigerant Data and Safety Classifications

| Refrigerant Number | Chemical Name ^{a, b} | Chemical Formula ^a | Molecular Mass ^a | Normal Boiling Point ^a | | Safety Group |
|-----------------------|-------------------------------|---------------------------------|-----------------------------|-----------------------------------|------|--------------|
| | | | | (°C) | (°F) | |
| <i>Methane Series</i> | | | | | | |
| 11 | trichlorofluoromethane | CCl ₃ F | 137.4 | 24 | 75 | A1 |
| 12 | dichlorodifluoromethane | CCl ₂ F ₂ | 120.9 | -30 | -22 | A1 |
| 12B1 | bromochlorodifluoromethane | CBrClF ₂ | 165.4 | -4 | 25 | |
| 13 | chlorotrifluoromethane | CClF ₃ | 104.5 | -81 | -115 | A1 |
| 13B1 | bromotrifluoromethane | CBrF ₃ | 148.9 | -58 | -72 | A1 |

TABLE 1 (Continued)
Refrigerant Data and Safety Classifications

| Refrigerant Number | Chemical Name ^{a, b} | Chemical Formula ^a | Molecular Mass ^a | Normal Boiling Point ^a | | Safety Group |
|---------------------------------|---|--|-----------------------------|-----------------------------------|------|-----------------|
| | | | | (°C) | (°F) | |
| 14 | tetrafluoromethane (carbon tetrafluoride) | CF ₄ | 88.0 | -128 | -198 | A1 |
| 21 | dichlorofluoromethane | CHCl ₂ F | 102.9 | 9 | 48 | B1 |
| 22 | chlorodifluoromethane | CHClF ₂ | 86.5 | -41 | -41 | A1 |
| 23 | trifluoromethane | CHF ₃ | 70.0 | -82 | -116 | A1 |
| 30 | dichloromethane (methylene chloride) | CH ₂ Cl ₂ | 84.9 | 40 | 104 | B2 |
| 31 | chlorofluoromethane | CH ₂ ClF | 68.5 | -9 | 16 | |
| 32 | difluoromethane (methylene fluoride) | CH ₂ F ₂ | 52.0 | -52 | -62 | A2 |
| 40 | chloromethane (methyl chloride) | CH ₃ Cl | 50.5 | -24 | -12 | B2 |
| 41 | fluoromethane (methyl fluoride) | CH ₃ F | 34.0 | -78 | -108 | |
| 50 | methane | CH ₄ | 16.0 | -161 | -259 | A3 |
| Ethane Series | | | | | | |
| 113 | 1,1,2-trichloro-1,2,2-trifluoroethane | CCl ₂ FCFClF ₂ | 187.4 | 48 | 118 | A1 |
| 114 | 1,2-dichloro-1,1,2,2-tetrafluoroethane | CClF ₂ CClF ₂ | 170.9 | 4 | 38 | A1 |
| 115 | chloropentafluoroethane | CClF ₂ CF ₃ | 154.5 | -39 | -38 | A1 |
| 116 | hexafluoroethane | CF ₃ CF ₃ | 138.0 | -78 | -109 | A1 |
| 123 | 2,2-dichloro-1,1,1-trifluoroethane | CHCl ₂ CF ₃ | 153.0 | 27 | 81 | B1 |
| 124 | 2-chloro-1,1,1,2-tetrafluoroethane | CHClCF ₃ | 136.5 | -12 | 10 | A1 |
| 125 | pentafluoroethane | CHF ₂ CF ₃ | 120.0 | -49 | -56 | A1 |
| 134a | 1,1,1,2-tetrafluoroethane | CH ₂ FCF ₃ [*] | 102.0 | -26 | -15 | A1 |
| 141b | 1,1-dichloro-1-fluoroethane | CH ₃ CCl ₂ F [*] | 117.0 | 32 | 90 | |
| 142b | 1-chloro-1,1-difluoroethane | CH ₃ CClF ₂ [*] | 100.5 | -10 | 14 | A2 |
| 143a | 1,1,1-trifluoroethane | CH ₃ CF ₃ [*] | 84.0 | -47 | -53 | A2 |
| 152a | 1,1-difluoroethane | CH ₃ CHF ₂ [*] | 66.0 | -25 | -13 | A2 |
| 170 | ethane | CH ₃ CH ₃ | 30.0 | -89 | -128 | A3 |
| Propane Series | | | | | | |
| 218 | octafluoropropane | CF ₃ CF ₂ CF ₃ | 188.0 | -37 | -35 | A1 |
| 236fa | 1,1,1,3,3,3-hexafluoropropane | CF ₃ CH ₂ CF ₃ | 152.0 | -1 | 29 | A1 |
| 245fa | 1,1,1,3,3-pentafluoropropane | CF ₃ CH ₂ CHF ₂ | 134.0 | 15 | 59 | A1 [†] |
| 290 | propane | CH ₃ CH ₂ CH ₃ | 44.0 | -42 | -44 | A3 |
| Cyclic Organic Compounds | | | | | | |
| C318 | octafluorocyclobutane | -(CF ₂) ₄ [*] | 200.0 | -6 | 21 | |

See Table 2 for Blends

TABLE 1 (Continued)
Refrigerant Data and Safety Classifications

| Refrigerant Number | Chemical Name ^{a, b} | Chemical Formula ^a | Molecular Mass ^a | Normal Boiling Point ^a | | Safety Group |
|--|---|---|-----------------------------|-----------------------------------|------|--------------|
| | | | | (°C) | (°F) | |
| <i>Miscellaneous Organic Compounds</i> | | | | | | |
| hydrocarbons | | | | | | |
| 600 | butane | CH ₃ CH ₂ CH ₂ CH ₃ | 58.1 | 0 | 31 | A3 |
| 600a | isobutane | CH(CH ₃) ₂ CH ₃ [*] | 58.1 | -12 | 11 | A3 |
| oxygen compounds | | | | | | |
| 610 | ethyl ether | CH ₃ CH ₂ OCH ₂ CH ₃ [*] | 74.1 | 35 | 94 | |
| 611 | methyl formate | HCOOCH ₃ | 60.0 | 32 | 89 | B2 |
| sulfur compounds | | | | | | |
| 620 | <i>(Reserved for future assignment)</i> | | | | | |
| <i>Nitrogen Compounds</i> | | | | | | |
| 630 | methyl amine | CH ₃ NH ₂ | 31.1 | -7 | 20 | |
| 631 | ethyl amine | CH ₃ CH ₂ (NH ₂) [*] | 45.1 | 17 | 62 | |
| <i>Inorganic Compounds</i> | | | | | | |
| 702 | hydrogen | H ₂ | 2.0 | -253 | -423 | A3 |
| 704 | helium | He | 4.0 | -269 | -452 | A1 |
| 717 | ammonia | NH ₃ | 17.0 | -33 | -28 | B2 |
| 718 | water | H ₂ O | 18.0 | 100 | 212 | A1 |
| 720 | neon | Ne | 20.2 | -246 | -411 | A1 |
| 728 | nitrogen | N ₂ | 28.1 | -196 | -320 | A1 |
| 732 | oxygen | O ₂ | 32.0 | -183 | -297 | |
| 740 | argon | Ar | 39.9 | -186 | -303 | A1 |
| 744 | carbon dioxide | CO ₂ | 44.0 | -78 | -109 | A1 |
| 744A | nitrous oxide | N ₂ O | 44.0 | -90 | -129 | |
| 764 | sulfur dioxide | SO ₂ | 64.1 | -10 | 14 | B1 |
| <i>Unsaturated Organic Compounds</i> | | | | | | |
| 1150 | ethene (ethylene) | CH ₂ =CH ₂ | 28.1 | -104 | -155 | A3 |
| 1270 | propene (propylene) | CH ₃ CH=CH ₂ | 42.1 | -48 | -54 | A3 |

a. The chemical name, chemical formula, molecular mass, and normal boiling point are not part of this standard.

b. The preferred chemical name is followed by the popular name in parentheses.

* Indicates that this formula has been edited for consistency with IUPAC conventions.

† This classification is provisional and will be reviewed when additional information is obtained through an application for revision submitted in accordance with Section 8.

TABLE 2
Data and Safety Classifications for Refrigerant Blends

| Refrigerant Number | Composition (Weight %) | Azeotropic Temperature | | Molecular Mass ^a | Normal Boiling Point ^a | | Safety Group |
|--------------------------------------|--|------------------------|------|-----------------------------|-----------------------------------|------|--------------|
| | | (°C) | (°F) | | (°C) | (°F) | |
| <i>Zeotropes</i> | | | | | | | |
| 400 | R-12/114 (must be specified) | none | none | | | | A1/A1 |
| 401A | R-22/152a/124 (53/13/34) ^e | | | | | | A1/A1 |
| 401B | R-22/152a/124 (61/11/28) ^e | | | | | | A1/A1 |
| 401C | R-22/152a/124 (33/15/52) ^e | | | | | | A1/A1 |
| 402A | R-125/290/22 (60/2/38) ^f | | | | | | A1/A1 |
| 402B | R-125/290/22 (38/2/60) ^f | | | | | | A1/A1 |
| 403A | R-290/22/218 (5/75/20) ^g | | | | | | A1/A1 |
| 403B | R-290/22/218 (5/56/39) ^g | | | | | | A1/A1 |
| 404A | R-125/143a/134a (44/52/4) ^f | | | | | | A1/A1 |
| 405A | R-22/152a/142b/C318 (45/7/5.5/42.5) ^h | | | | | | |
| 406A | R-22/600a/142b (55/4/41) ⁱ | | | | | | A1/A2 |
| 407A | R-32/125/134a (20/40/40) ^o | | | | | | A1/A1 |
| 407B | R-32/125/134a (10/70/20) ^o | | | | | | A1/A1 |
| 407C | R-32/125/134a (23/25/52) ^o | | | | | | A1/A1 |
| 407D | R-32/125/134a (15/15/70) ^o | | | | | | A1/A1 |
| 407E | R-32/125/134a (25/15/60) ^r | | | | | | A1/A1 |
| 408A | R-125/143a/22 (7/46/47) ^f | | | | | | A1/A1 |
| 409A | R-22/124/142b (60/25/15) ^k | | | | | | A1/A1 |
| 409B | R-22/124/142b (65/25/10) ^k | | | | | | A1/A1 |
| 410A | R-32/125 (50/50) ^l | | | | | | A1/A1 |
| 410B | R-32/125 (45/55) ⁿ | | | | | | A1/A1 |
| 411A | R-1270/22/152a (1.5/87.5/11.0) ^m | | | | | | A1/A2 |
| 411B | R-1270/22/152a (3/94/3) ^m | | | | | | A1/A2 |
| 412A | R-22/218/142b (70/5/25) ^k | | | | | | A1/A2 |
| 413A | R-218/134a/600a (9/88/3) ^q | | | | | | A1/A2 |
| <u>414A</u> | <u>R-22/124/600a/142b (51.0/28.5/4.0/16.5)^s</u> Pending other action | | | | | | <u>A1</u> |
| <i>Azeotropes^b</i> | | | | | | | |
| 500 | R-12/152a (73.8/26.2) | 0 | 32 | 99.3 | -33 | -27 | A1 |
| 501 | R-22/12 (75.0/25.0) ^c | -41 | -42 | 93.1 | -41 | -42 | A1 |
| 502 | R-22/115 (48.8/51.2) | 19 | 66 | 112.0 | -45 | -49 | A1 |
| 503 | R-23/13 (40.1/59.9) | 88 | 126 | 87.5 | -88 | -126 | |
| 504 | R-32/115 (48.2/51.8) | 17 | 63 | 79.2 | -57 | -71 | |
| 505 | R-12/31 (78.0/22.0) ^c | 115 | 239 | 103.5 | -30 | -22 | |
| 506 | R-31/114 (55.1/44.9) | 18 | 64 | 93.7 | -12 | 10 | |

TABLE 2 (Continued)
Data and Safety Classifications for Refrigerant Blends

| Refrigerant Number | Composition (Weight %) | Temperature | | Azeotropic Molecular Mass ^a | Normal Boiling Point ^a | | Safety Group |
|--------------------|------------------------|-------------|-------|--|-----------------------------------|--------|-------------------|
| | | (°C) | (°F) | | (°C) | (°F) | |
| 507A ^P | R-125/143a (50/50) | -40 | -40 | 98.9 | -46.7 | -52.1 | A1 |
| 508A ^P | R-23/116 (39/61) | -86 | -122 | 100.1 | -86 | -122 | A1 |
| 508B | R-23/116 (46/54) | -45.6 | -50.1 | 95.4 | -88.3 | -126.9 | A1 /A1 |
| 509A ^P | R-22/218 (44/56) | 0 | 32 | 124.0 | -47 | -53 | A1 |

- ^a The molecular mass and normal boiling point are not part of this standard.
- ^b Azeotropic refrigerants exhibit some segregation of components at conditions of temperature and pressure other than those at which they were formulated. The extent of segregation depends on the particular azeotrope and hardware system configuration.
- ^c The exact composition of this azeotrope is in question, and additional experimental studies are needed.
- ^d *Held open for future use, formerly used as an indicator of the provisional status of safety classifications.*
- ^e Composition tolerances are (±2/+0.5,-1.5/±1).
- ^f Composition tolerances are (±2/±1/±2).
- ^g Composition tolerances are (+ 0.2, -2.0/±2.0/±2.0).
- ^h Composition tolerances for the individual components are (±2/±1/±1/±2) and for the sum of R-152a and R-142b are (+0,-2).
- ⁱ Composition tolerances are (±2/±1/±1).
- ^k Composition tolerances are (±2/±2/±1).
- ^l Composition tolerances are (+0.5,-1.5/+1.5,-0.5).
- ^m Composition tolerances are (+0,-1/+2,-0/+0,-1).
- ⁿ Composition tolerances are (±1/±1).
- ^o Composition tolerances are (±2/±2/±2).
- ^p R-507, R-508, and R-509 are allowed alternative designations for R-507A, R-508A, and R-509A due to a change in designations after assignment of R-500 through R-509. Corresponding changes were not made of R-500 through R-506.
- ^q Composition tolerances are (±1/±2/+0,-1).
- ^r Composition tolerances are (±2, ±2, ±2).
- ^s Composition tolerances are (±2.0/±2.0/±0.5/+0.5,-1.0).

TABLE B1
Comparison of Safety Group Classifications to Those
under ASHRAE Standard 34-1989

| Refrigerant Number | Chemical Formula | Safety Group | |
|--------------------|---|--------------|------------------|
| | | Old | New |
| 10 | CCl ₄ | 2 | B1 |
| 11 | CCl ₃ F | 1 | A1 |
| 12 | CCl ₂ F ₂ | 1 | A1 |
| 13 | CClF ₃ | 1 | A1 |
| 13B1 | CBrF ₃ | 1 | A1 |
| 14 | CF ₄ | 1 | A1 |
| 21 | CHCl ₂ F | 2 | B1 |
| 22 | CHClF ₂ | 1 | A1 |
| 30 | CH ₂ Cl ₂ | 2 | B2 |
| 40 | CH ₃ Cl | 2 | B2 |
| 50 | CH ₄ | 3a | A3 |
| 113 | CCl ₂ FCClF ₂ | 1 | A1 |
| 114 | CClF ₂ CClF ₂ | 1 | A1 |
| 115 | CClF ₂ CF ₃ | 1 | A1 |
| 123 | CHCl ₂ CF ₃ | | B1 |
| 134a | CH ₂ FCF ₃ | | A1 |
| 142b | CH ₃ CClF ₂ | 3b | A2 |
| 152a | CH ₃ CHF ₂ | 3b | A2 |
| 170 | CH ₃ CH ₃ | 3a | A3 |
| 290 | CH ₃ CH ₂ CH ₃ | 3a | A3 |
| C318 | C ₄ F ₈ | 1 | A1 |
| 400 | R12/114 | 1 | A1 A1 |
| 500 | R-12/152a | 1 | A1 |
| 501 | R-22/12 | 1 | A1 |
| 502 | R-22/115 | 1 | A1 |
| 600 | CH ₃ CH ₂ CH ₂ CH ₃ | 3a | A3 |
| 600a | CH(CH ₃) ₃ | 3a | A3 |
| 611 | HCOOCH ₃ | 2 | B2 |
| 702 | H ₂ | | A3 |
| 704 | He | | A1 |
| 717 | NH ₃ | 2 | B2 |
| 718 | H ₂ O | | A1 |
| 720 | Ne | | A1 |
| 728 | N ₂ | | A1 |
| 740 | Ar | | A1 |
| 744 | CO ₂ | 1 | A1 |
| 764 | SO ₂ | 2 | B1 |
| 1140 | CH ₂ =CHCl | | B3 |
| 1150 | CH ₂ =CH ₂ | 3a | A3 |
| 1270 | CH ₃ CH=CH ₂ | 3a | A3 |

NOTICE

INSTRUCTIONS FOR SUBMITTING A PROPOSED CHANGE TO THIS STANDARD UNDER CONTINUOUS MAINTENANCE

This standard is maintained under continuous maintenance procedures by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. SSPC consideration will be given to proposed changes according to the following schedule:

Deadline for receipt of proposed changes

February 20

SSPC will consider proposed changes at next

ASHRAE Annual Meeting (normally June)

Proposed changes must be submitted to the Manager of Standards (MOS) in the latest published format available from the MOS. However, the MOS may accept proposed changes in an earlier published format, if the MOS concludes that the differences are immaterial to the proposed changes. If the MOS concludes that the current form must be utilized, the proposer may be given up to 20 additional days to resubmit the proposed changes in the current format.

Specific changes in text or values are required and must be substantiated. The Manager of Standards will return to the submitter any change proposals that do not meet these requirements. Supplemental background documents to support changes submitted may be included.

**FORM FOR SUBMITTAL OF PROPOSED CHANGE TO ASHRAE STANDARD
UNDER CONTINUOUS MAINTENANCE**

(Please type)

1. Submitter: _____
(name—type)

Affiliation: _____

Address: _____ City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____ E-Mail: _____

I hereby grant the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) the non-exclusive royalty rights, including non-exclusive royalty rights in copyright, in my proposals and I understand that I acquire no rights in publication of this standard in which my proposal in this or other similar analogous form is used. I hereby attest that I have the authority and am empowered to grant this copyright release.

Author's Signature: _____ Date: _____

NOTE: Use a separate form for each comment, completing each section (including Sections 1 and 2) to facilitate processing.

2. Number and Year of Standard:

3. Clause (i.e., Section), Subclause or Paragraph Number, and Page Number:

4. I Propose To: Change to read as shown Delete and substitute as shown
(check one) Add new text as shown Delete without substitution

(Indicate the proposed change by showing a strikeout line through material to be deleted and underlining material to be added. After showing the text to be changed, insert a horizontal line and state the purpose, reason, and substantiation for the proposed change. Use additional pages if necessary.)

5. Proposed Change:

6. Purpose, Reason, and Substantiation Statements:

(Be brief; provide abstracts of lengthy substantiation; full text should be enclosed for reference on request by project committee members.)

Check if additional pages are attached. Number of additional pages: _____

NOTE: Use separate form for each comment. Submittals (MS Word 7 preferred) may be attached to e-mail (preferable), submitted on diskettes, uploaded to ASHRAE's ftp site, or submitted in paper form by mail or fax to ASHRAE, Manager of Standards, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: change.proposal@ashrae.org. Ftp server address: [ftp.ashrae.org](ftp://ftp.ashrae.org), directory: *change.proposal*. Fax: 404-321-5478

ELECTRONIC PREPARATION/SUBMISSION OF FORM FOR PROPOSING CHANGES

An electronic version of each change, which must comply with the instructions in the Notice and the Form, is the preferred form of submittal to ASHRAE Headquarters at the address shown below. The electronic format facilitates both paper-based and computer-based processing. Submittal in paper form is acceptable. The following instructions apply to change proposals submitted in electronic form.

Use the appropriate file format for your word processor and save the file in either Microsoft Word 7 (preferred) or higher or WordPerfect 5.1 for DOS format. Please save each change proposal file with a different name (example, prop001.doc, prop002.doc, etc., for Word files—prop001.wpm, prop002.wpm, etc., for WordPerfect files). If supplemental background documents to support changes submitted are included, it is preferred that they also be in electronic form as wordprocessed or scanned documents.

Electronic change proposals may be submitted either as files (MS Word 6 preferred) attached to an e-mail (uuencode preferred), files uploaded to an ftp site, or on 3.5" floppy disk. ASHRAE will accept the following as equivalent to the signature required on the change submittal form to convey non-exclusive copyright:

| | |
|--|---|
| Files attached to e-mail: | Electronic signature on change submittal form (as a picture; *.tif, or *.wpg), or e-mail address. |
| Files on disk or uploaded to ftp site: | Electronic signature on change submittal form (as a picture; *.tif, or *.wpg), listing of the submitter's e-mail address on the change submittal form, or a letter with submitter's signature accompanying the disk or sent by facsimile (single letter may cover all of proponent's proposed changes). |

Submit e-mail, ftp file, or disks containing change proposal files to:

Manager of Standards
ASHRAE
1791 Tullie Circle, NE
Atlanta, GA 30329-2305

E-mail: change.proposal@ashrae.org

Ftp server address: [ftp.ashrae.org](ftp://ftp.ashrae.org), logon to anonymous ftp in directory: *change.proposal*.

(Alternatively, mail paper versions to ASHRAE address or Fax: 404-321-5478.)

The form and instructions for electronic submittal to ASHRAE's ftp site or as attachments to e-mail may be obtained from the Standards section of ASHRAE's Home Page, <http://www.ashrae.org>, or by contacting a Standards Secretary, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. Phone: 404-636-8400. Fax: 404-321-5478.

Email: standards.section@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.