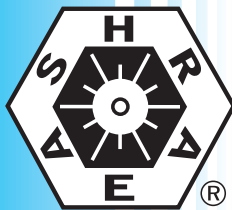


ANSI/ASHRAE Addenda i, j, and k to
ANSI/ASHRAE Standard 34-2007



ASHRAE STANDARD

Designation and Safety Classification of Refrigerants

Approved by the ASHRAE Standards Committee on January 19, 2008; by the ASHRAE Board of Directors on January 23, 2008; and by the American National Standards Institute on January 24, 2008.

This standard is under continuous maintenance 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. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE Web site, <http://www.ashrae.org>, or in paper form from the Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 404-321-5478. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada).

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This American National Standard (ANS) is a national voluntary consensus standard developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

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

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Assistant Director of Technology for Standards and Special Projects of ASHRAE should be contacted for:

- a. interpretation of the contents of this Standard,
- b. participation in the next review of the Standard,
- c. offering constructive criticism for improving the Standard, or
- d. permission to reprint portions of the Standard.

DISCLAIMER

ASHRAE uses its best efforts to promulgate Standards and Guidelines for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines will be nonhazardous or free from risk.

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ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

(This foreword is not part of this 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.)

FOREWORD

This addendum adds a designation of R-434A to the blend R125/143a/134a/600a (63.2/18.0/16.0/2.8) with composition tolerances of $(\pm 1.0/\pm 1.0/\pm 1.0/+0.1,-0.2)$; a safety classification of A1; an RCL of 73,000 ppm, 320 g/m³, 20 lb/Mcf; and a code classification of neither highly toxic nor toxic. It also updates Table D2 with the molecular mass, bubble point, and dew point data as provided in the application.

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 34-2007

Add the following entries for R-434A:

TABLE 2 Data and Safety Classifications for Refrigerant Blends

Refrigerant Number = 434A
 Composition (Mass %) =
R-125/143a/134a/600a (63.2/18.0/16.0/2.8)
 Composition Tolerances = $(\pm 1.0/\pm 1.0/\pm 1.0/+0.1,-0.2)$
 Safety Group = A1
 RCL = 73,000 ppm (v/v), 320 g/m³, 20 lb/Mcf
 Highly Toxic or Toxic Under Code Classification = Neither

TABLE D2 Data for Refrigerant Blends

Refrigerant Number = 434A
 Composition (Weight %) =
R-125/143a/134a/600a (63.2/18.0/16.0/2.8)
 Average Molecular Mass = 105.7
 Bubble Point (°C) = -45.0
 Dew Point (°C) = -42.3
 Bubble Point (°F) = -49.0
 Dew Point (°F) = -44.1

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FOREWORD

This addendum adds data for R-601 to Table 1 and adds R-601 to Table D1 and Table E1 with underlying toxicity and flammability data as provided in the application, with the following exceptions: 1) LFL = 1.2 vol%, 2) the rat LC₅₀ for isopentane shall be applied to n-pentane.

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 34-2007

Add the following entries for R-601:

TABLE 1 Refrigerant Data and Safety Classifications

Refrigerant Number = 601
 Chemical Name = pentane
 Chemical Formula = CH₃CH₂CH₂CH₂CH₃
 Safety Group = A3
 RCL = 1,000 ppm (v/v), 2.9 g/m³, 0.2 lb/Mcf
 Highly Toxic or Toxic Under Code Classification = Neither

TABLE D1 Refrigerant Data

Refrigerant Number = 601
 Chemical Name = pentane
 Chemical Formula = CH₃CH₂CH₂CH₂CH₃
 Molecular Mass = 72.1
 Normal Boiling Point (°C) = 36.1
 Normal Boiling Point (°F) = 97.0

TABLE E1 Toxicity and Flammability Data for Single-Compound Refrigerants

Refrigerant R- = 601
 Chemical Name = pentane
 LC₅₀ = 434,000^u
 Cardiac Sensitization LOEL = ND
 Cardiac Sensitization NOEL = ND
 Anesthesia EC₅₀ = ND
 Anesthesia LOEL = 32,000
 Anesthesia NOEL = 16,000
 Other = ND
 ATEL = 1,000
 ODL = 140,000
 FCL = 3,000
 RCL = 1,000
 LFL = 12,000
 ATEL Source = Sect 7.1.1 (b)
 RCL Source = ATEL

^uThe value shown is the LC₅₀ for isopentane. The value for pentane is expected to be similar.

(This foreword is not part of this 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.)

FOREWORD

This addendum adds to Section 9.6.1 the following missing information to complete refrigerant applications:

- g. anesthetic and central nervous system effects*
- h. other escape-impairing effects and permanent injury*

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 k to Standard 34-2007

9.6.1 Acute Toxicity. Applications shall include the following short-term toxicity data, with identified sources, for single-compound refrigerants or for each component of blends:

- a. ACGIH TLV-C if assigned,
- b. ACGIH TLV-STEL if assigned,
- c. NIOSH IDLH if assigned,
- d. LC50 for four hours for rats,
- e. LD50 if available, ~~and~~
- f. cardiac sensitization response level,
- g. anesthetic and central nervous system effects, and
- h. other escape-impairing effects and permanent injury.

**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.