ADDENDA

ANSI/ASHRAE Addenda z, aa, and ab to
ANSI/ASHRAE Standard 34-2010

Designation and Safety Classification of Refrigerants

Approved by the ASHRAE Standards Committee on June 23, 2012; by the ASHRAE Board of Directors on June 27, 2012; and by the American National Standards Institute on June 28, 2012.

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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 Manager of Standards of ASHRAE should be contacted for:

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FOREWORD

This addendum adds definitions of "bubble point" and "dew point" to Section 3 of this standard.

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 z to Standard 34-2010

Add the following definitions to Section 3, Definitions of Terms.

bubble point: the liquid saturation temperature of a refrigerant at the specified pressure; the temperature at which a liquid refrigerant first begins to boil. The bubble point of a zeotropic refrigerant blend, at constant pressure, is lower than the dew point.

dew point: the vapor saturation temperature of a refrigerant at the specified pressure; the temperature at which the last drop of liquid refrigerant boils. The dew point of a zeotropic refrigerant blend, at constant pressure, is higher than the bubble point.

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FOREWORD

This addendum modifies Section 9.5.2.2, Azeotropic Blends, to define the requirements applicants shall provide as evidence of the existence of an azeotropic blend within the intended application range in requesting an R-500 Series Designation.

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 aa to Standard 34-2010

Add the following underlined language to Section 9.5.2.2 of this standard and modify 9.5.2.2(i), Evidence of Azeotropy:

9.5.2.2 Azeotropic Blends. Applications for an azeotropic (R-500-series) blend shall provide evidence proving that an azeotrope exists at the nominal blend composition within the intended application range, typically the temperature range $T_{NBP} < T < (0.95T_{crit})$, where T_{NBP} is the bubble-point temperature at a pressure of 0.101 MPa and T_{crit} is the critical temperature (in Kelvin) of the blend. The existence of the azeotrope shall be proven by one or more of the following methods:

a. Measurement of the vapor-liquid equilibrium at the azeotropic temperature at multiple compositions and with sufficient accuracy to (1) show the existence of a maximum or a minimum in the vapor pressure of the mixture and (2) to define the composition of the maximum or minimum.

b. Measurement of the vapor-liquid equilibrium at the azeotropic pressure at multiple compositions and with sufficient accuracy to (1) show the existence of a maximum or a minimum in the boiling point of the mixture and (2) to define the composition of the maximum or minimum.

c. Experimental data showing that the azeotropic composition under consideration (x wt%) is achieved at the overhead of a high-efficiency distillation column (theoretical plates >20), when the two compositions x/2 wt% and (100–x)/2 wt% are distilled separately.

Azeotropic blends exhibit some segregation of components at other conditions. The blend must not deviate substantially from azeotropic behavior at conditions away from the azeotropic temperature and pressure as evidenced by a temperature glide less than 0.5°C (0.9°F) over the temperature range $T_{NBP} < T < (0.95T_{crit})$. This requirement shall be met by either experimental evidence or a computer simulation of phase equilibrium behavior, provided that the computer model has been verified by experimental data.

The following additional information shall be provided for azeotropes:

…

i. ~~Evidence of azeotropy, including a detailed description of testing and a vapor-liquid equilibrium diagram (optional supporting information may be provided as an appendix)~~A vapor-liquid equilibrium diagram plotting either temperature versus composition at constant pressure or pressure versus composition at constant temperature.

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FOREWORD

This addendum adds new zeotropic refrigerant 443A 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 ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.*

Addendum ab 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 = 443A
Composition (Mass %) = R-1270/290/600a (55.0/40.0/5.0)
Composition tolerances = (±2.0/±2.0/±1.2)
OEL = 580
Safety Group = A3
RCL = 1700 ppm v/v; 3.1 g/m^3; 0.19 lb/Mcf
Highly Toxic or Toxic Under Code Classification = Neither

TABLE D2 Data for Refrigerant Blends

Refrigerant Number = 443A
Composition (Mass %) = R-1270/290/600a (55.0/40.0/5.0)
Average Molecular Mass = 43.48
Bubble Point (°C) = –44.8
Bubble Point (°F) = –48.6
Dew Point (°C) = –41.2
Dew Point (°F) = –42.2

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.