ADDENDA

ANSI/ASHRAE Addendum c to
ANSI/ASHRAE Standard 15-2022

Safety Standard for Refrigeration Systems

Approved by ASHRAE and the American National Standards Institute on September 30, 2024.

This addendum was approved 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. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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FOREWORD

Two different but similar terms have been used throughout ANSI/ASHRAE Standard 15 throughout the years, one the currently defined term, "refrigerating system," and the other "refrigeration system." This is known as the "ting" vs. "shun" debate. After much discussion, SSPC 15 has determined to only use the term "refrigeration system" moving forward. Addendum c editorially revises the term "refrigerating system" to "refrigeration system" where appropriate.

Informative 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 15-2022

Modify Section 3 as shown. The remainder of Section 3 remains unchanged.

3. DEFINITIONS

3.1 Defined Terms

[. . .]

cascade ~~refrigerating~~ refrigeration system: a ~~*refrigerating*~~ *refrigeration system* having two or more *refrigerant* circuits, each with a *pressure imposing element*, a *condenser*, and an *evaporator*, where the *evaporator* of one circuit absorbs the heat rejected by another (lower-temperature) circuit.

[. . .]

compound ~~refrigerating~~ refrigeration system: a *multistage* ~~*refrigerating*~~ *refrigeration system* in which a single charge of *refrigerant* circulates through all stages of compression. See *multistage* ~~*refrigerating*~~ *refrigeration system*.

[. . .]

condenser: that part of the ~~*refrigerating*~~ *refrigeration system* where *refrigerant* is liquefied by the removal of heat.

[. . .]

design pressure: the maximum gage pressure for which a specific part of a ~~*refrigerating*~~ *refrigeration system* is designed.

[. . .]

ductless HVAC: an air conditioner, *heat pump*, or dehumidifier in which conditioned air is distributed directly into the *conditioned space* from the ~~*refrigerating*~~ *refrigeration system* without the use of *air ducts*.

[. . .]

evaporator: that part of the ~~*refrigerating*~~ *refrigeration system* designed to vaporize liquid *refrigerant* to produce refrigeration.

[. . .]

heat pump: a ~~*refrigerating*~~ *refrigeration system* used to transfer heat into a space or substance.

high side: a portion or stage of a ~~*refrigerating*~~ *refrigeration system* that is subject to *condenser* or *gas cooler* pressure.

horsepower (hp): the power delivered from the prime mover to the *compressor* of a ~~*refrigerating*~~ *refrigeration system*.

[. . .]

liquid receiver: a vessel, permanently connected to a ~~*refrigerating*~~ *refrigeration system* by inlet and outlet pipes, for storage of liquid *refrigerant*.

[. . .]

low side: the portion of a ~~*refrigerating*~~ *refrigeration system* that is subjected to approximate *evaporator* pressure.

machinery: refrigerating equipment forming a part of the ~~*refrigerating*~~ *refrigeration system*, including (but not limited to) any or all of the following: *compressor, condenser, liquid receiver, evaporator*, and connecting *piping*.

machinery room: a designated space meeting the requirements of Sections 8.9, 8.10, and 8.11 that contains one or more ~~*refrigerating*~~ *refrigeration systems* or portions thereof, such as *compressors* and *pressure vessels*.

[. . .]

multistage ~~refrigerating~~ refrigeration system: a ~~*refrigerating*~~ *refrigeration system* in which compression of *refrigerant* is carried out in two or more steps.

[. . .]

pressure vessel: any *refrigerant*-containing receptacle in a ~~*refrigerating*~~ *refrigeration system*. This does not include *evaporators* where each separate *evaporator* section does not exceed 0.5 ft^3 (0.014 m^3) of *refrigerant*-containing volume, regardless of the maximum *inside dimension*. This also does not include *evaporator coils*, *compressors*, *condenser coils*, controls, *headers*, pumps, and *piping*.

[. . .]

refrigerant: the fluid used for heat transfer in a ~~*refrigerating*~~ *refrigeration system*; *refrigerant* absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a change of state.

[. . .]

~~refrigerating~~ refrigeration system: a combination of interconnected parts forming a closed circuit in which *refrigerant* is circulated for the purpose of extracting then rejecting heat. (See Section 5 for classification of ~~*refrigerating*~~ *refrigeration systems* by type).

~~refrigerating~~ refrigeration system classification: ~~*refrigerating*~~ *refrigeration systems* are classified according to the degree of probability, low or high, that leaked *refrigerant* from a failed connection, seal, or component could enter an occupied area. The distinction is based on the basic design or location of the components. (See Section 5 for classification of ~~*refrigerating*~~ *refrigeration systems* by type).

~~refrigerating~~ refrigeration system, direct: see Section 5.1.1.

~~refrigerating~~ refrigeration system, indirect: see Section 5.1.2.

[. . .]

Modify Section 4 as shown. The remainder of Section 4 remains unchanged.

4. OCCUPANCY CLASSIFICATION

4.1 Locations of ~~*refrigerating*~~ *refrigeration systems* are described by *occupancy* classifications that consider the ability of people to respond to potential exposure to *refrigerant* as follows.

[. . .]

Modify Section 5 as shown. The remainder of Section 5 remains unchanged.

5. ~~REFRIGERATING~~ REFRIGERATION SYSTEM CLASSIFICATION

5.1 ~~Refrigerating~~ Refrigeration Systems. ~~*Refrigerating*~~ *Refrigeration systems* are defined by the method employed for extracting or delivering heat as follows (see Figure 5-1).

5.1.1 A *direct system* is one in which the *evaporator* or *condenser* of the ~~*refrigerating*~~ *refrigeration systems* is in direct contact with the air or other substances to be cooled or heated.

5.1.2 An *indirect system* is one in which a *secondary coolant* cooled or heated by the ~~*refrigerating*~~ *refrigeration system* is circulated to the air or other substance to be cooled or heated. *Indirect systems* are distinguished by the method of application given below.

[. . .]

Figure 5-1 ~~Refrigerating~~ Refrigeration system designation.

Modify Section 7 as shown. The remainder of Section 7 remains unchanged.

7. RESTRICTIONS ON REFRIGERANT USE

7.1 General. The *occupancy*, ~~*refrigerating*~~ *refrigeration system*, and *refrigerant* safety classifications cited in this section *shall* be determined in accordance with Sections 4, 5, and 6, respectively.

[. . .]

7.5.1.2 Corridors and Lobbies. ~~*Refrigerating*~~ *Refrigeration systems* in a public *corridor* or *lobby shall* comply with the following:

[. . .]

Modify Section 8 as shown. The remainder of Section 8 remains unchanged.

8. INSTALLATION RESTRICTIONS

[. . .]

8.6 Gas Fuel Equipment. Gas fuel devices and equipment used with ~~*refrigerating*~~ *refrigeration systems shall* be installed in accordance with *approved* safety standards and the requirements of the AHJ.

[. . .]

8.8 Refrigerant Parts in Air Duct. All field-installed *refrigerant*-containing parts, including joints, of a ~~*refrigerating*~~ *refrigeration system* located in an *air duct* carrying conditioned air to and from an *occupied space shall* be constructed to withstand a temperature of 700°F (371°C) without leakage into the airstream.

[. . .]

8.9 Refrigerating Machinery Room, General Requirements. When a ~~*refrigerating*~~ *refrigeration system* is located indoors and a *machinery room* is required by Section 7.4, the *machinery room shall* be in accordance with the following provisions.

[. . .]

8.11.11.3 Level 2 Ventilation. A part of the refrigerating *machinery room* mechanical ventilation referred to in Section 8.11.11.1 *shall* exhaust an accumulation of *refrigerant* due to leaks or a rupture of a ~~*refrigerating*~~ *refrigeration system*, or portion thereof, in the *machinery room*. The *refrigerant detectors* required in accordance with Section 8.11.8 *shall* activate ventilation at a set point and response time in accordance with Table 8-1, at an airflow rate not less than the value determined in accordance with Section 8.11.11.4.

When multiple *refrigerant designations* are in the *machinery room*, evaluate the required airflow according to each ~~*refrigerating*~~ *refrigeration system*, and the highest airflow quantity *shall* apply.

[. . .]

8.12 When a ~~*refrigerating*~~ *refrigeration system* is located outdoors more than 20 ft (6.1 m) from building openings and is enclosed by a penthouse, lean-to, or other open structure, natural or mechanical ventilation *shall* be provided...

[. . .]

Modify Section 9 as shown. The remainder of Section 9 remains unchanged.

9. DESIGN AND CONSTRUCTION OF EQUIPMENT AND SYSTEMS

9.1 Materials

9.1.1 General. Materials used in the construction and installation of ~~*refrigerating*~~ *refrigeration systems shall* be suitable for conveying the *refrigerant* used. …

[. . .]

9.2.6 Components of ~~*refrigerating*~~ *refrigeration systems* that use carbon dioxide (R-744) as a heat transfer fluid *shall* comply with the minimum *design pressure* requirements in Section 9.2.6.1 through 9.2.6.4. …

[. . .]

9.2.6.2 Cascade ~~*refrigerating*~~ *refrigeration systems shall* comply…

9.2.6.3 Transcritical ~~*refrigerating*~~ *refrigeration systems shall* comply…

[. . .]

9.4.1 ~~*Refrigerating*~~ *Refrigeration systems shall* be protected …

[. . .]

9.7.2 *Pressure vessels* containing liquid *refrigerant* that are capable of being isolated by *stop valves* from other parts of a ~~*refrigerating*~~ *refrigeration systems shall* be provided …

[. . .]

9.8 Positive Displacement Compressor Protection. …

[. . .]

b. Low-stage or booster *compressors* in *compound* ~~*refrigerating*~~ *refrigeration systems*…

[. . .]

9.10.1.2 Refrigerant Parts in Air Duct. All *refrigerant*-containing parts of a ~~*refrigerating*~~ *refrigeration systems*…

[. . .]

9.10.5 Flexible Connectors, Expansion and Vibration Compensators. Flexible connectors and expansion, vibration control devices or other similar components *shall* be *listed* to UL 207 [19] or CSA C22.2 No. 140.3 [20] for the specific *refrigerant* of the ~~*refrigerating*~~ *refrigeration system* for which the components are installed, and *shall* have *design pressure* in accordance with Section 9.2.

[. . .]

9.11.1 Approvals. Joints and connections *shall* be either *listed* or an *approved* type. Joints and connections *shall* be tight for the pressure of the ~~*refrigerating*~~ *refrigeration system* when tested in accordance with Section 9.13.

[. . .]

9.11.4.2.1* Flared Joints. Single-flare fittings *shall not* be used in any part of a ~~*refrigerating*~~ *refrigeration system*…

[. . .]

9.12.1 Piping Location. *Refrigerant piping* fabricated, assembled, installed, or erected on the ~~*refrigerating*~~ *refrigeration system*'s *premises shall* comply …

[. . .]

9.12.1.5.1 Shaft Alternative. A shaft enclosure *shall not* be required for the *refrigerant piping* for any of the following ~~*refrigerating*~~ *refrigeration systems:*

[. . .]

9.12.2 Installation Requirements for Flammable Refrigerants. *Refrigerant piping* for ~~*refrigerating*~~ *refrigeration systems* using …

[. . .]

9.12.5.1 ~~Refrigerating~~ Refrigeration Systems Containing More Than 6.6 lb (3.0 kg) of Refrigerant. *Stop valves shall* be installed in the following locations on ~~*refrigerating*~~ *refrigeration systems* containing more than 6.6 lb (3.0 kg) of *refrigerant*: …

[. . .]

9.12.5.2 ~~Refrigerating~~ Refrigeration Systems Containing More Than 110 lb (50 kg) of Refrigerant. In addition to *stop valves* required by Section 9.12.5.1, systems containing more than 110 lb (50 kg) of *refrigerant shall* have *stop valves* installed in the following locations: …

[. . .]

9.13 ~~Refrigerating~~ Refrigeration System Testing

9.13.1 General. ~~*Refrigerating*~~ *refrigeration systems* …

[. . .]

9.13.5 Piping System Strength Test. ~~*Refrigerating*~~ *refrigeration systems* …

[. . .]

9.14.1 Every pressure containing component of a ~~*refrigerating*~~ *refrigeration system*, other than *pressure vessels*, *piping*, pressure gages, and control mechanisms, *shall* be *listed* either individually or as part of a complete ~~*refrigerating*~~ *refrigeration system*…

[. . .]

9.14.3 When a pressure gage is permanently installed on the *high side* of a ~~*refrigerating*~~ *refrigeration system*…

[. . .]

9.15.1 All serviceable components of ~~*refrigerating*~~ *refrigeration systems*…

[. . .]

9.16.2 The test pressure applied to the *high side* of each factory-assembled ~~*refrigerating*~~ *refrigeration system shall* be at least equal to the *design pressure* of the *high side*. The test pressure applied to the *low side* of each factory-assembled ~~*refrigerating*~~ *refrigeration system* …

[. . .]

9.17 Nameplate. Each *unit system* and each separate *condensing unit*, *compressor*, or *compressor unit* sold for field assembly in a ~~*refrigerating*~~ *refrigeration shall* …

[. . .]

Modify Section 10 as shown. The remainder of Section 10 remains unchanged.

10. GENERAL REQUIREMENTS

10.1 Signs and Identification

10.1.1 Installation Identification. Each ~~*refrigerating*~~ *refrigeration system*…

[. . .]

10.2 Charging, Withdrawal, and Disposition of Refrigerants. No service *containers shall* be left connected to a *refrigeration system* except while charging or withdrawing *refrigerant*. *Refrigerants* withdrawn from ~~*refrigerating*~~ *refrigeration systems shall* be transferred…

[. . .]

10.3 Containers. *Containers* used for *refrigerants* withdrawn from a ~~*refrigerating*~~ *refrigeration system*…

[. . .]

10.5 Maintenance. ~~*Refrigerating*~~ *refrigeration systems*…

[. . .]

10.6 Responsibility for Operation and Emergency Shutdown. It *shall* be the duty of the person in charge of the *premises* on which a ~~*refrigerating*~~ *refrigeration system*…

[. . .]

Modify Informative Appendix A as shown. The remainder of Informative Appendix A remains unchanged.

INFORMATIVE APPENDIX A
EXPLANATORY MATERIAL

[. . .]

Section 3.1

nationally recognized testing laboratory (NRTL): For the U.S., the Occupational Safety and Health Administration (OSHA) is one such national body. Refer to 29 CFR 1910.7 [65].

refrigerant detection system: The product safety standard addresses both *refrigerant detection systems* and leak detection systems. In the product safety standard, a leak detection system is defined as "a sensing system, which responds to *refrigerant* leaking from a refrigeration system." A leak detection system may include gas sensing, ultrasonic, or other such methods that meet the standards UL 60335-2-40 [5]/CSA C22.2 No. 60335-2-40 [6] or UL 60335-2-89 [7]/CSA C22.2 No. 60335-2-89 [8].

Modify Informative Appendix F as shown. The remainder of Informative Appendix F remains unchanged.

INFORMATIVE APPENDIX F
EMERGENCIES IN REFRIGERATING MACHINERY ROOMS

This standard specifies refrigerating *machinery* rooms under some conditions to reduce risks from large ~~*refrigerating*~~ *refrigeration systems* and large amounts of *refrigerant*. …

[. . .]

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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