BSR/ASHRAE Addendum u
to ANSI/ASHRAE Standard 15-2024

First Public Review Draft

Proposed Addendum u to Standard 15-2024, Safety Standard for Refrigeration Systems

First Public Review (June 2026)
(Draft shows Proposed Changes to Current Standard)

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FOREWORD

This proposed addendum addresses clean up in multiple sections of the standard including

- *Permissive language – add "shall be" where appropriate*
- *"All of the following" – remove language "All of the following" and actually list the required sections*
- *Machine Guarding reference update – update machine guarding to reference ISO 14120*

Note: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.

Addendum u to Standard 15-2024

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

7. RESTRICTIONS ON REFRIGERANT USE

[…]

Exceptions to 7.4: *Listed self-contained systems* ~~are~~ *shall* be permitted outside of a *machinery room*, provided that such systems are not located in public hallways or *lobbies* and are limited to the following *occupancies* and *refrigerant* quantities:

[…]

7.5 Additional Restrictions

[…]

7.5.1 All Occupancies.

[…]

*{Note to reviewers: proposed **Addendum h** to Standard 15-2024 renumbers from Section 7.5.1.9 to Section 7.5.1.3.}*

7.5.1.9 Addition of Doors to Open Refrigerated Display Cases Containing Flammable Refrigerants. ~~It is acceptable for doors to be added to open display cases containing flammable *refrigerants* only when in accordance with all of the following:~~ Conversion of display cases containing flammable *refrigerants* from open to closed, by addition of one or more doors, *shall* comply with Sections 7.5.1.9(a) through 7.5.1.9(c).

[…]

7.6* High-Probability Air Conditioners, Heat Pumps, and Dehumidifiers Using Group A2L Refrigerants. Air conditioners, *heat pumps*, or dehumidifiers classified as *high-probability systems*, containing Group A2L *refrigerants*, and within the scope of UL 484 11 or UL 60335-2-40 5/CSA C22.2 No. 60335-2-40 6, *shall* comply with ~~this section~~ Sections 7.6.1 through 7.6.4.

[…]

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

8. INSTALLATION RESTRICTIONS [...]

8.2* Guards. Moving *machinery shall* be guarded in accordance with *approved* safety standards [14] and other applicable national or local regulations.

[...]

8.9.5 Each *machinery room shall* contain a *refrigerant detector*, located in an area where *refrigerant* from a leak will concentrate, that actuates an alarm and mechanical ventilation in accordance with Section 8.9.6 at a set point not greater than the *occupational exposure limit* (*OEL*) value as published in ASHRAE Standard 34.3 For *refrigerants* that do not have a published *OEL* value in Standard 34, a set point determined in accordance with the *OEL* as defined by Standard 34 *shall* be *approved* by the AHJ. The alarm *shall* annunciate visual and audible alarms inside the *machinery room* and outside each entrance to the *machinery room*. The alarms required in this section *shall* be of the manual-reset type with the reset located inside the *machinery room*. Alarms set at other levels (such as *IDLH*) and automatic reset alarms ~~are~~ *shall* be permitted in addition to those required by this section. The meaning of each alarm *shall* be clearly marked by signage near the annunciators.

[...]

8.11.10.3 Alarms set at levels other than Table 8-1 (such as *IDLH*), and automatic reset alarms, ~~are~~ *shall* be permitted in addition to those required by Section 8.11.10. The meaning of each alarm *shall* be clearly marked by signage near the annunciators.

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

9. DESIGN AND CONSTRUCTION OF REFRIGERATION EQUIPMENT AND SYSTEMS

[…]

9.2 Refrigeration System Design Pressure

[…]

9.2.6 Refrigeration systems containing carbon dioxide. Components of *refrigeration systems* that use carbon dioxide (R-744) as a heat transfer fluid *shall* comply with the minimum *design pressure* requirements in Sections 9.2.6.1 through 9.2.6.4. The pressure at maximum operating conditions referenced by Sections 9.2.6.1 through 9.2.6.3 *shall* be the highest pressure experienced during the ~~following~~ conditions of Section 9.2.6(a) through 9.2.6(c).~~:~~

[…]

9.2.6.2 Cascade *refrigeration systems shall* comply with ~~all of the following:~~ Sections 9.2.6.2(a) and 9.2.6.2(b).

[…]

9.2.6.3 Transcritical *refrigeration systems shall* comply with ~~all of the following:~~ Sections 9.2.6.3(a) through 9.2.6.3(c).

[…]

9.4 Pressure Relief Protection

[…]

9.4.3 Hydrostatic Expansion. Pressure rise resulting from hydrostatic expansion due to temperature rise of liquid *refrigerant* trapped in or between closed valves *shall* be addressed by ~~the following~~ compliance to Sections 9.4.3.1 and 9.4.3.2.

[…]

9.7 Pressure Vessel Protection
[…]

Exceptions to 9.7.2.3: A single relief valve ~~is~~ *shall* be permitted on *pressure vessels* of 10 ft3 (0.285 m3) or more *internal gross volume* when all of the following conditions are met:
[…]

9.7.8 Discharge from Pressure Relief Devices. Pressure relief systems designed for vapor *shall* comply with ~~Section 9.7.8~~ Sections 9.7.8.1 through 9.7.8.4. Pressure relief systems designed for liquid *shall* comply with Section 9.4.3. ~~Different *refrigerants shall not* be vented into a common relief *piping* system unless the *refrigerants* are included in a *blend* that is recognized by ASHRAE Standard 34.[3]~~
[…]

9.7.8.1 Discharging Location Interior to Building. *Pressure relief devices*, including *fusible plugs*, serving *refrigeration systems shall* be permitted to discharge to the interior of a building only ~~when all of the following apply:~~ where in accordance with all conditions of Sections 9.7.8.1(a) through 9.7.8.1(e).
[...]
~~*Refrigeration systems* that do not meet the above requirements *shall* meet the requirements of Sections 9.7.8.2, 9.7.8.3, and 9.7.8.4.~~

9.7.8.2 Discharging Location Exterior to Building. *Pressure relief devices* designed to discharge external to the *refrigeration system* and not meeting the conditions of Section 9.7.8.1 *shall* be arranged to discharge outside of a building and comply with ~~all of the following~~ Sections 9.7.8.2(a) through 9.7.8.2(f):
[…]

9.7.8.3 Internal Relief. *Pressure relief valves* designed to discharge from a higher-pressure vessel into a lower-pressure vessel internal to the *refrigeration system shall* comply with ~~all of the following~~ Sections 9.7.8.3(a) through 9.7.8.3(c):
[…]

9.7.8.4 Discharge Location, Special Requirements. Different *refrigerants shall not* be vented into a common relief *piping* system unless the *refrigerants* are included in a *blend* that is recognized by ASHRAE Standard 34.[3] Additional requirements for *pressure relief device* discharge location and allowances *shall* apply for specific *refrigerants* as ~~*listed*~~ delineated in this section.

9.7.8.4.1 Water (R-718). Where water is the only *refrigerant*, discharge to a floor drain *shall* be permitted where ~~all of the following conditions are met:~~ where in accordance with Sections 9.7.8.4.1(a) through 9.7.8.4.1(c).
[…]

9.8 Positive Displacement Compressor Protection.
[…]

Exceptions to (a) (b) and (c): The discharge capacity of the *pressure relief device* ~~is~~ *shall* be allowed to be the minimum regulated flow rate of the *compressor* when all of the following conditions are met:
[…]

9.12.1.5 Refrigerant Pipe Shafts. *Refrigerant piping* that penetrates two or more floor/ceiling assemblies *shall* be enclosed in a *fire-resistance-rated* shaft enclosure. The *fire-resistance-rated* shaft enclosure *shall* comply with the requirements of the *building code*. Other building utilities or *piping* systems *shall* be ~~allowed~~ permitted in the *refrigerant piping* shaft.

[…]

9.13.3 Test Gases. The medium used for pressure testing the *refrigeration system shall* be one of the following inert gases: oxygen-free nitrogen, helium, argon, or premixed nonflammable oxygen-free nitrogen with a tracer gas of hydrogen or helium. For R-744 *refrigeration systems*, carbon dioxide *shall* be ~~allowed~~ permitted as the test medium. For R-718 *refrigeration systems*, water *shall* be ~~allowed~~ permitted as the test medium.

9.13.5 Refrigerant Piping Strength Test. *Refrigeration system* components and *refrigerant piping shall* be tested in accordance with ASME B31.5 17 or this section. Separate tests for isolated portions of the *refrigeration system* ~~are~~ *shall* be permitted, provided that all required portions are tested at least once. Pressurize with test gas for a minimum of ten (10) minutes to not less than the lower of (a) the lowest *design pressure* for any *refrigeration system* component or (b) the lowest value of *set pressure* for any *pressure relief devices* in the *refrigeration system*. The *design pressures* for determination of test pressure *shall* be the pressure identified on the label nameplate of the *condensing unit*, *compressor*, *compressor unit*, *pressure vessel*, or other *refrigeration system* component with a nameplate. A passing test result *shall* have no rupture or structural failure of any *refrigeration system* component or *refrigerant piping*.

9.16.1.1 Testing Procedure
[…]

Exceptions to 9.16.1.1:
1. Mixtures of dry nitrogen, inert gases, and Class 1 *refrigerants* 3 ~~are~~ *shall* be allowed for factory tests.
2. Mixtures of dry nitrogen, inert gases, or a combination of these with Class 2L, Class 2, or Class 3 *refrigerants* 3 in concentrations not exceeding the lesser of a *refrigerant* weight fraction (mass fraction) of 5% or 25% of the *lower flammability limit* (*LFL*) ~~are~~ *shall* be allowed for factory tests.
3. Compressed air without added *refrigerant* ~~is~~ *shall* be allowed for factory tests, provided the *refrigeration system* is subsequently evacuated to less than 1000 µm (132 Pa) before charging with *refrigerant*. The required evacuation level is atmospheric pressure for *refrigeration systems* using R-718 (water) or R-744 (carbon dioxide) as the *refrigerant*.

13. NORMATIVE REFERENCES
~~14. UL. 2015. UL 1995, Heating and Cooling Equipment, 5th Edition. Northbrook, IL: UL LLC.~~
14. See Informative Appendix B, "Informative References."

INFORMATIVE APPENDIX A EXPLANATORY MATERIAL
[...]
Section 8.2
ISO 14120 [14] provides general guidance on guards for moving machinery. For the U.S., the Occupational Safety and Health Administration (OSHA) has requirements for guarding of machinery, refer to 29 CFR 1910.212 [xx].
INFORMATIVE APPENDIX B
INFORMATIVE REFERENCES
~~14. See Section 13, "Normative References."~~
14. ISO. 2015. ISO 14120, Safety of machinery − Guards − General requirements for the design and construction of fixed and movable guards, Edition 2 dated November 1, 2015. Geneva, Switzerland: ISO.
[...]
xx. GPO. 2025. 29 CFR 1910.212, Subpart O Machinery and Machine Guarding, General requirements for all machines. Washington, DC: U.S. Government Publishing Office.

{Note to reviewers: below is a clean version showing the above proposed changes of ***Addendum u*** *when combined with published* ***Addendum h****, only the proposed changes of Addendum u shown above are open for public comment}*

7.5.1.3 Addition of Doors to Open Refrigerated Display Cases Containing Flammable Refrigerants.
Conversion of display cases containing flammable *refrigerants* from open to closed, by addition of one or more doors, *shall* comply with Sections 7.5.1.3(a) through 7.5.1.3(c).
[…]