ADDENDA

ANSI/ASHRAE Addendum c to
ANSI/ASHRAE Standard 15.2-2022

Safety Standard for Refrigeration Systems in Residential Applications

Approved by ASHRAE and the American National Standards Institute on March 29, 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

Addendum c corrects misalignment between ANSI/ASHRAE Standard 15.2 and UL 60335-2-40, Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers *to ensure that listed products are correctly installed, which is critical for authorities having jurisdiction, installers, and others.*

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 15.2-2022

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

4. DEFINITIONS

4.1 Defined Terms

[. . .]

****leak detection system:*** a sensing system that responds to *refrigerant* leaking from a *refrigeration system.*

[. . .]

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

5. GENERAL REQUIREMENTS

5.1* Equipment Requirements. *Refrigeration systems* using A2L *refrigerants shall* be *listed* and labeled to UL 60335-2-40/CSA-C22.2 No. 60335-2-40~~-19~~ [2] or UL 484/CSA C22.2 No. 117 [3]. *Refrigeration systems* using A1 *refrigerants shall* be *listed* to UL 60335-2-40/CSA-C22.2 No. 60335-2-40~~-19~~, UL 484/CSA C22.2 No. 117, or UL 1995/CSA C22.2 No. 236 [4]. The *equipment shall* be *installed* in accordance with its *listing*. ~~*Refrigerant-*~~ *Leak detection systems* ~~required by~~ *shall* comply with Section 5.3. The equipment *shall* be marked with the *refrigerant* employed in the system on the name plate. Indoor and *outdoor sections* of the same *split system shall* be marked with the same *refrigerant* safety group.

[. . .]

5.3* Manufacturer's ~~Refrigerant~~ Leak Detection System Requirements. ~~*Refrigeration systems* using an A2L *refrigerant* with more than m_1 *refrigerant charge shall* have an *integral refrigerant detection system* unless the system complies with one of the following:~~

~~a. *Ducted HVAC* systems with the *equipment* and all *duct* openings located 5.9 ft (1.8 m) or greater above the finished floor with a *system refrigerant charge* (m_s) less than the *maximum refrigerant charge* (m_{max}) as determined by Sections 9.5 and 9.6 using the dispersal floor area as determined by Section 9.4.2.2;~~

~~b. *Ducted HVAC* systems with a *system refrigerant charge* (m_s) less than the *maximum refrigerant charge* (m_{max}) as determined by Sections 9.5 and 9.6, and with the indoor *equipment* located 3.9 ft (1.2 m) or greater above the finished floor; or~~

~~c. *Refrigeration systems* other than those covered in Sections 5.3(a) and (b) with a *system refrigerant charge* (m_s) less than the *maximum refrigerant charge* (m_{max}) as determined by Sections 9.5 and 9.6.~~

5.3.1 *Refrigeration systems* using an A2L *refrigerant* with more than m_1 *releasable refrigerant charge shall* have a *leak detection system* if operation for *circulation* or *ventilation* is initiated by a *leak detection system* for compliance with Section 9.5.

5.3.2 *Refrigeration systems* using *safety shut-off valves* for compliance with Section 9.6.3 *shall* have a *leak detection system*.

5.3.3~~5.3.1~~ The ~~*refrigerant-*~~ *leak detection system shall* comply with the following:

a. ~~Use a nonadjustable~~The set points to initiate *mitigation actions shall* not be manually or remotely adjustable.

b. Recalibration of the *refrigerant detector* or *leak detection system*, other than self-recalibration, *shall not* be permitted.

c. Capable of detecting the loss of the *refrigerant* contained in the *refrigeration system*.
d. Have *access* for replacement of ~~*refrigerant*~~ *leak detection system* components.
e. Have self-diagnostics to determine operational status of the sensing element.
f. Upon failure of a self-diagnostic check, energize ~~*Energize*~~ air *circulation* fans of the *equipment* and *ventilation* fans, if applicable, per Section 11. ~~upon failure of a self-diagnostic check.~~
g. Generate an output signal in not more than 30 seconds when exposed to a *refrigerant* concentration of 25% *LFL* (+0%, –1%). ~~Tested under either of the following two conditions to ensure an output signal is initiated in not more than~~
   ~~1. 15 seconds when sensing a *refrigerant* concentration of ≤25% *LFL* or~~
   ~~2. 10 seconds when sensing a *refrigerant* concentration of >25% but ≤100% *LFL*.~~

5.3.4~~5.3.2~~ Mitigation Action Requirements. When a ~~*refrigerant*~~ *leak detection system* provides an output signal, the following *mitigation actions shall* occur within 15 seconds:

a. Energize the air *circulation* fan(s) of the *equipment* per *manufacturer's installation instructions*.
b. Open zoning dampers installed in the *ductwork* connected to the *refrigeration system*.
c. Activate required mechanical *ventilation* per Section 11, "Mechanical *Ventilation*."
d. De-energize electric *duct* heaters installed in the *ductwork* connected to the *refrigeration system*.
   Exception to 5.3.4(d)~~5.3.2(d)~~: De-energization of *duct* heaters is not required when both of the following are met:
   1. There is proof of airflow before the *duct* heater is energized, and
   2. Airflow through the *duct* heater is greater than 200 fpm (1.02 m/s).
e. Close the *safety shut-off valves.*

[. . .]

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

7. LOCATION OF REFRIGERATION SYSTEMS AND RESTRICTIONS

[. . .]

7.1.1 Outdoor Equipment. *Equipment* installed outdoors *shall* be *listed* and marked as suitable for outdoor use by the manufacturer.~~"For outdoor use only" per UL 1995/CSA C22.2 No. 236[4] or rated IPX4 or higher per UL 60335-2-40/CSA C22.2 No. 60335-2-40[2].~~

[. . .]

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

8. PIPING REQUIREMENTS

[. . .]

8.4.2 Joint Between Different *Piping* Materials. [. . .] Adapter fittings with threaded ends between different materials *shall* be joined with proper thread lubricant in accordance with Section 8.4.5.2.3~~8.4.5.5~~.

[. . .]

8.4.5 Joint Preparation and Installation. The preparation and installation of *brazed*, mechanical, flared, press-connect, and threaded *joints shall* comply with Sections 8.4.5.1 and 8.5.4.2. ~~through 8.4.5.5.~~

[. . .]

8.4.5.2 Mechanical Joints. *Mechanical joints shall* be installed in accordance with the *manufacturer's installation instructions*.

[. . .]

8.4.5.2.1~~8.4.5.3~~Flared Joints. [. . .]

8.4.5.2.2~~8.4.5.4~~Press-Connect Joints. [. . .]

8.4.5.2.3~~8.4.5.5~~Threaded Joints.

Table 8-4 Allowable Joints

Material	Brazed (Section 8.4.5.1)	Mechanical (Section 8.4.5.2)	Flared (Section 8.4.5.2.1) ~~(Section 8.4.5.3)~~	Press-Connect (Section 8.4.5.2.2) ~~(Section 8.4.5.4)~~
Aluminum tube	✓	✓		✓
Copper tube	✓	✓	✓	✓

[. . .]

8.5.2.1 Field Applied Joints.

[. . .]

c. Enclosed in a manner that will direct a leak in the joint to the appliance with a ~~refrigerant~~ *leak detection system* or to the outdoors

[. . .]

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

9. REFRIGERANT CHARGE LIMITS

[. . .]

9.4.2.1 Spaces Connected by Ducted HVAC Systems with a ~~Refrigerant~~ Leak Detection System or Ducted HVAC Systems Using Continuous Air Circulation. The aggregate floor area of *spaces* connected to the same supply air distribution *ductwork shall* be used as the dispersal floor area. *Spaces* where the airflow may be limited by zone dampers *shall not* be included in the determination of dispersal floor area for *ducted HVAC* systems using continuous air *circulation.*

[. . .]

9.4.2.2 Spaces Connected by Ducted HVAC Systems without a ~~Refrigerant~~ Leak Detection System. The *dispersal floor area shall* be the smallest room floor area of any *space* connected to the same supply air distribution *ductwork.*

[. . .]

9.5* Maximum Allowable Refrigerant Charge. The *maximum refrigerant charge* (m_{max}) allowed for the *dispersal volume* identified using Section 9.4 *shall* be determined as follows. The *circulation* and *ventilation* operations in Sections 9.5.1 and 9.5.2 shall be continuous or initiated by a *leak detection system*.

9.5.1 For A2L refrigeration systems without ventilation,

$$m_{max} = C \times M \tag{9-5a}$$

where

C = *LFL* conversion factor as given in Table 9-2 or by Equation 9.5c (for *refrigerant designations* not given in Table 9-2)

M = allowable *refrigerant* amount in a *dispersal volume*, as given in Table 9-3 in lb_m (kg)

9.5.2 For A2L *refrigeration systems* with *ventilation*:

$$m_{max} = C \times (M + \mathrm{MV}) \tag{9-5b}$$

where

C = *LFL* conversion factor as given in Table 9-2 or by Equation 9.5c (for *refrigerant designations* not given in Table 9-2)

M = allowable *refrigerant* amount in a *dispersal volume*, as given in Table 9-3 in lb_m (kg)

MV = additional *refrigerant* mass allowed in a *dispersal volume* based on dilution using *ventilation* as given in Table 9-4 in lb_m (kg)

$$C = \left(\frac{LFL}{LFL_{R\text{-}32}}\right)^{1.25} \tag{9-5c}$$

where

LFL = *lower flammability limit,* lb/1000 ft^3 (g/m^3)

$LFL_{R\text{-}32}$ = *lower flammability limit* of R-32, lb/1000 ft^3 (g/m^3)

[. . .]

9.6.4.1 *Safety shut-off valves shall* be specified for use in the *manufacturer's installation instructions*. When *safety shut-off valves* are activated by the ~~*refrigerant*~~ *leak detection system*, the valves *shall* close and remain closed until corrective action is taken. *Safety shut-off valves shall* be designed to close in the event of an electric power failure.

[. . .]

Table 9-2 LFL Conversion Factor

Refrigerant	*C*
R-32	1.00
R-452B	1.02
R-454A	0.90~~0.92~~
R-454B	0.96~~0.97~~
R-454C	0.94~~0.95~~
R-457A	0.65~~0.71~~

Modify Section 11 as shown. The remainder of Section 11 remains unchanged.

11. MECHANICAL VENTILATION

11.1 Ventilation. Where used as a basis for adjusting the maximum *refrigerant charge* (m_{max}) in Section 9.5~~9.6~~, *ventilation shall* comply with Sections 11.1.1 through 11.1.3.

11.1.1 *Ventilation air shall* be operated continuously in accordance with Section 11.1.1.1 or controlled by a ~~*refrigerant*~~ *leak detection system* provided by the manufacturer that is integral to the *appliance* in accordance with Section 11.1.1.2.

[. . .]

11.1.1.2 Operation by ~~Refrigerant~~ Leak Detection System. *Ventilation* initiation by a ~~*refrigerant*~~ *leak detection system shall* operate continuously for a minimum of five minutes after the ~~*refrigerant*~~ *leak detection system* is automatically reset due to *refrigerant* concentration falling below the set point. The *ventilation* airflow *shall* be verified by a monthly self test. Upon detection of the *ventilation* system failure, the *refrigeration system compressor* operation *shall* cease.

[. . .]

11.1.2 Airflow Control Devices. Airflow control devices, such as air valves or dampers, *shall* be driven fully open~~ed~~ when a ~~*refrigerant*~~ *leak detection system* detects ~~*refrigerant*~~ a *refrigerant* leak. ~~Zone dampers, where present, *shall* fully open when a *refrigerant detection system* detects *refrigerant*.~~

[. . .]

Modify Section 12 as shown. The remainder of Section 12 remains unchanged.

12. ADD-ON HEAT PUMPS

[. . .]

12.1.1 The *refrigerant detector*(s) of the ~~*refrigerant*~~ *leak detection system shall* be an *integral* part of the indoor coil assembly.

12.1.2 Wiring connecting the ~~*refrigerant*~~ *leak detection system* to a furnace assembly *shall* use, at a minimum, 18 AWG wire with a minimum insulation thickness of 0.0625 in. (1.58 mm), or the wire *shall* be protected from damage.

12.1.3* Upon detection of a leak, the ~~*refrigerant*~~ *leak detection system shall* activate the indoor fan to supply full stage cooling airflow.

12.1.4 The airflow speed setting selected on the furnace *shall* provide the airflow specified in the *add-on heat pump manufacturer's installation instructions.*

12.1.5 The ~~*refrigerant*~~ *leak detection system shall* be tested for proper orientation after installation in accordance with the *manufacturer's installation instructions*.

[. . .]

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

INFORMATIVE APPENDIX A
EXPLANATORY MATERIAL

[. . .]

Section 4, "Definitions"

[. . .]

leak detection system: a *refrigerant detection system* is an example of a *leak detection system*.

[. . .]

Section 9.5

[. . .]

When *refrigerants* are being used that are not listed in Table 9-2, use Equations 9-5c to calculate the *C* factor. The value of $LFL_{R\text{-}32}$ is as follows

- $LFL_{R\text{-}32} = 19.2\ lb_m/1000\ ft^3$
- $LFL_{R\text{-}32} = 306\ g/m^3$

[. . .]

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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