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

First Public Review Draft

Proposed Addendum d to Standard 15.2-2024, Safety Standard for Refrigeration Systems in Residential Applications

First Public Review (July 2025)
(Draft shows Proposed Changes to Current Standard)

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FOREWORD

This addendum addresses requirements for installation of refrigeration systems in an isolated space because refrigeration systems with charge less than m_1 need to be evaluated when installed in an isolated space.

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 d to Standard 15.2-2024

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

4. DEFINITIONS

isolated space: A space in which all or part of an *appliance's refrigeration system* containing a Group A2L *refrigerant* is installed, and which is not within air *circulation* provided by a fan *integral* to the *appliance* or if the *appliance* does not have an *integral* fan.

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

5. GENERAL REQUIREMENTS

[. . .]

5.6 Requirements for Installations in an *Isolated Space*.

5.6.1 *Isolated spaces shall* comply with one of the following:

a. Continuous mechanical *ventilation* of the *isolated space*.

b. Mechanical *ventilation* of the *isolated space* activated by a *leak detection system* located within the part of the refrigeration system in the *isolated space* to provide *ventilation air* per Table 5-1 and in accordance with Section 11.

c. Permanently connected to the outdoors with a minimum of two permanent *ventilation* openings with a total open area of no less than 225 in^2 (0.15 m^2). The lower edge of the lower *ventilation* opening *shall* not be more than 4 in (102 mm) above the finished floor level. The lower opening *shall* not be smaller than 50% of the total area of the *ventilation* openings. Where louvered openings are used, the net free area of louvers *shall* be used to determine compliance with this section.

d. Natural *ventilation* in accordance with 5.6.2 where the connected *space* itself is not an *isolated space.*

Exceptions to 5.6.1:

a. An *isolated space* having continuous pipe or tube or refrigeration pipes or tubes with field-applied joints in accordance with Section 8.5.2.1.

b. An *isolated space* with floor area larger than indicated in Table 5-2 for the installed system's *refrigerant charge.*

c. Natural *ventilation* to another *isolated space* where the combined floor area is larger than indicated in Table 5-2 for the installed system's *refrigerant charge.*

5.6.2 *Isolated Space* Connected by Natural *Ventilation*. For an *isolated space* complying with Section 5.6.1 the following *shall* apply:

a. A connected *isolated space shall* be on the same floor.

b. Connected spaces *shall* be provided with a minimum of two permanent natural *ventilation* openings with a total open area of no less than 225 in^2 (0.15 m^2). The lower edge of the lower natural *ventilation* opening *shall* not be more than 4 in (102 mm) above the finished floor level. The lower opening *shall* not be smaller than 50% of the total area of the *ventilation* openings. Where louvered openings are used, the net free area of louvers *shall* be used to determine compliance with this section.

Table 5-1 Ventilation Rate for an *Isolated Space*

System Refrigerant Charge [a]		***Ventilation Rate***	
lbm	***kg***	***cfm***	**m^3/h**
0.4	*0.2*	*20*	*34*
0.7	*0.3*	*40*	*68*
1.1	*0.5*	*60*	*102*
1.4	*0.6*	*80*	*136*
1.8	*0.8*	*100*	*170*
2.1	*1.0*	*120*	*204*
2.5	*1.1*	*140*	*238*
2.8	*1.3*	*160*	*272*
3.2	*1.4*	*180*	*306*
3.5	*1.6*	*200*	*340*
4.2	*1.9*	*220*	*374*
4.6	*2.1*	*240*	*408*
5.0	*2.3*	*260*	*442*
5.4	*2.4*	*280*	*476*
5.8	*2.6*	*300*	*510*
6.2	*2.8*	*320*	*544*
6.5	*3.0*	*340*	*578*
6.9	*3.1*	*360*	*612*
7.3	*3.3*	*380*	*646*
7.3	*3.5*	*≥400*	*≥680*

a. For refrigerant charge falling between the values *listed* in this table, interpolation *shall* be permitted to determine the precise *ventilation* rates. Otherwise, the closest higher charge value *shall* be used.

Table 5-2 Floor Area for an *Isolated Space* Determination Based on 7.2 ft (2.2 m) Dispersal Height

System Refrigerant Charge [a]		***Floor Area***	
lbm	***kg***	***ft²***	**m²**
0.5	*0.2*	*7.2*	*0.7*
1.0	*0.5*	*14.3*	*1.3*
2.0	*0.9*	*28.6*	*2.7*
3.0	*1.4*	*42.9*	*4.0*
4.0	*1.8*	*57.2*	*5.3*
5.0	*2.3*	*71.5*	*6.6*
6.0	*2.7*	*85.8*	*8.0*
7.0	*3.2*	*100.1*	*9.3*
8.0	*3.6*	*114.4*	*10.6*
9.0	*4.1*	*128.7*	*12.0*
10.0	*4.5*	*143.0*	*13.3*
11.0	*5.0*	*171.3*	*15.9*
12.0	*5.4*	*203.9*	*18.9*
13.0	*5.9*	*239.3*	*22.2*
14.0	*6.4*	*277.5*	*25.8*
15.0	*6.8*	*318.6*	*29.6*
16.0	*7.3*	*362.5*	*33.7*
17.0	*7.7*	*409.2*	*38.0*
18.0	*8.2*	*458.8*	*42.6*
19.0	*8.6*	*511.2*	*47.5*
20.0	*9.1*	*566.4*	*52.6*
21.0	*9.5*	*624.5*	*58.0*
22.0	*10.0*	*685.4*	*63.7*
23.0	*10.4*	*749.1*	*69.6*

24.0	*10.9*	*815.6*	*75.8*
25.0	*11.3*	*885.0*	*82.2*
26.0	*11.8*	*957.3*	*88.9*
27.0	*12.2*	*1032.3*	*95.9*

a. For refrigerant charge falling between the values listed in this table, interpolation shall be permitted to determine the precise floor area. Otherwise, the closest higher charge value shall be used.

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

9. REFRIGERANT CHARGE LIMITS

[. . .]

9.4.3.5 ***Heat-Pump Water Heater***. The dispersal height of a heat-pump water heater shall be the ~~floor area of the space containing the heat pump water heater multiplied by the height of the appliance~~ actual height of the system or appliance but not less than 2.0 ft (0.6 m) and not or more than 9.0 ft (2.74 m).

[. . .]

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

INFORMATIVE APPENDIX A

EXPLANATORY MATERIAL

[. . .]

Section 5.6.2

This section addresses natural *ventilation* of a *space* to another indoor space where the *spaces* are connected by permanent openings. The minimum required area of the opening is calculated using the following equation:

$$A_{vent} = \frac{m_{rel} - m_{max}}{LFL \times 0.417} \times \sqrt{\frac{A_{confined}}{g \times m_{max}} \times \frac{M_{molar}}{M_{molar} - 29}} \qquad \textit{(IP)} \qquad \textit{(A–xx)}$$

$$A_{vent} = \frac{m_{rel} - m_{max}}{LFL \times 104} \times \sqrt{\frac{A_{confined}}{g \times m_{max}} \times \frac{M_{molar}}{M_{molar} - 29}} \qquad \textit{(SI)} \qquad \textit{(A–yy)}$$

Where,

m_{rel} = releasable *refrigerant charge*, kg or lb_m (per section 9.6).

m_{max} = maximum *refrigerant charge*, kg or lb_m (per section 9.5).

LFL = *lower flammability limit* of the *refrigerant*, kg/m^3 or $lb_m/1000\ ft^3$ (from ASHRAE Standard 34).

$A_{confined}$ = floor area of isolated *space*, m^2 or ft^2.

g = gravitational acceleration, 9.81 m/s^2 or 32.2 ft/s^2.

M_{molar} = relative molar mass of *refrigerant*, dimensionless.

These equations are not applicable for *refrigerants* with a relative molar mass less than 42.