ADDENDA

ANSI/ASHRAE Addendum a 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 October 31, 2022.

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

ANSI/ASHRAE Standard 15.2-2022 has a SF (safety factor) = 2 for ducted HVAC equipment that matches the fourth draft of UL 60335-2-40. However, ductless HVAC equipment still has an SF = 4 that differs from the UL 60335-2-40 draft. And the concept of gravity equation is not introduced. Therefore, the allowable refrigerant charge or minimum room area does not align between product safety standard and application safety standard. That will cause confusion in the field and likely misuse of certain HVAC equipment. Addendum a to ASHRAE Standard 15.2-2022 corrects the formulas by adding the gravity equation from the fourth edition of UL 60335-2-40, which will help inspectors, AHJs, and installers in the installation and approvals of the installed systems.

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 a to Standard 15.2-2022

Modify Section 9 as shown. Existing Tables 9-3 and 9-4 are replaced by the tables shown. The remainder of Section 9 remains unchanged.

9. REFRIGERANT CHARGE LIMITS

[. . .]

9.5.1 For A2L *refrigeration systems* without *ventilation*,

$$m_{max} = C \times M \text{ ~~× AF~~}$$

where

C = *LFL* conversion factor as given in Table 9-2

M = allowable *refrigerant* amount ~~allowed~~ in a *dispersal volume* ~~based on 25% *LFL*,~~ as given in Table 9-3 in lb_m (kg)

~~AF = 2 for systems with continuous *circulation* or *circulation* initiated by the *refrigerant detection system* 1 for all other systems~~

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

$$m_{max} = C \times (M + \text{MV}) \text{ ~~× AF~~}$$

where

C = *LFL* conversion factor as given in Table 9-2

M = allowable *refrigerant* amount ~~allowed~~ in a *dispersal volume* ~~based on 25% *LFL*,~~ 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)

~~AF = 2 for systems with continuous *circulation* or *circulation* initiated by the *refrigerant detection system* 1 for all other systems~~

[. . .]

9.6.3 *Releasable Refrigerant Charge* for Systems Using *Safety Shut-Off Valves* with A2L *Refrigerants*. The *releasable refrigerant charge* (m_{rel}) *shall* be the *refrigerant* amount contained in the interconnecting *tubing* and *indoor section* located downstream of the *safety shut-off valves* and *shall* be the largest value determined by Sections 9.6.3.1, 9.6.3.2, and 9.6.3.3. The *releasable refrigerant charge* (m_{rel}) *shall not* exceed the *maximum refrigerant charge* (m_{max}), as determined by Section 9.5. In the case of m_{rel} is not evaluated per Sections 9.6.3.1 through 9.6.3.3, refer to product *listing* for certified *releasable refrigerant charge*.

[. . .]

Table 9-3 M for A2L Systems Based on 7.2 ft (2.2 m) Dispersal Height[a]

Area[b]		*M*[c]			
		With *Circulation*		Without *Circulation*	
ft^2	m^2	lb_m	kg	lb_m	kg
100	9.3	6.9	3.1	6.9	3.1
125	11.6	8.6	3.9	8.6	3.9
150	13.9	10.3	4.7	10.3	4.7
175	16.3	12.1	5.5	11.1	5.0
200	18.6	13.8	6.3	11.9	5.4
225	20.9	15.5	7.0	12.6	5.7
250	23.2	17.2	7.8	13.3	6.0
275	25.5	18.9	8.6	13.9	6.3
300	27.9	20.7	9.4	14.6	6.6
325	30.2	22.4	10.2	15.2	6.9
350	32.5	24.1	10.9	15.7	7.1
375	34.8	25.8	11.7	16.3	7.4
400	37.2	27.6	12.5	16.8	7.6
425	39.5	29.3	13.3	17.3	7.9
450	41.8	31.0	14.1	17.8	8.1
475	44.1	32.7	14.9	18.3	8.3
500	46.5	34.4	15.6	18.8	8.5
525	48.8	35.1	15.9	19.3	8.7
550	51.1	35.1	15.9	19.7	8.9
575	53.4	35.1	15.9	20.2	9.1
600	55.7	35.1	15.9	20.6	9.3
625	58.1	35.1	15.9	21.0	9.5
650	60.4	35.1	15.9	21.4	9.7
675	62.7	35.1	15.9	21.8	9.9
700	65.0	35.1	15.9	22.2	10.1
725	67.4	35.1	15.9	22.6	10.3
750	69.7	35.1	15.9	23.0	10.4
775	72.0	35.1	15.9	23.4	10.6
800	74.3	35.1	15.9	23.8	10.8
825	76.6	35.1	15.9	24.1	11.0
850	79.0	35.1	15.9	24.5	11.1
875	81.3	35.1	15.9	24.9	11.3
900	83.6	35.1	15.9	25.2	11.4
925	85.9	35.1	15.9	25.6	11.6
950	88.3	35.1	15.9	25.9	11.8
975	90.6	35.1	15.9	26.2	11.9
1000	92.9	35.1	15.9	26.6	12.1
1025	95.2	35.1	15.9	26.9	12.2

a. For dispersal heights (h) other than 7.2 ft (2.2 m), not less than 2.0 ft (0.6 m), and not greater than 9.0 ft (2.7 m), multiply the charge quantities in this table by a correction factor of h_c, where $h_c = h/7.2$ ft (2.2 m).

b. Dispersal areas *shall* comply with Section 9.4.

c. For area sizes falling in between the values listed in this table, interpolation *shall* be permitted to determine precise charges. Otherwise, the closest lower area value *shall* be used.

Table 9-4 Additional Charge Permitted for A2L Systems Using Ventilation

Ventilation Rate		MV[a]			
		With *Circulation*		Without *Circulation*	
cfm	m^3/h	lb_m	kg	lb_m	kg
20	34	0.8	0.4	0.4	0.2
40	68	1.4	0.6	0.7	0.3
60	102	2.2	1.0	1.1	0.5
80	136	2.8	1.2	1.4	0.6
100	170	3.6	1.6	1.8	0.8
120	204	4.2	2.0	2.1	1.0
140	238	5.0	2.2	2.5	1.1
160	272	5.6	2.6	2.8	1.3
180	306	6.4	2.8	3.2	1.4
200	340	7.0	3.2	3.5	1.6
220	374	8.4	3.8	4.2	1.9
240	408	9.2	4.2	4.6	2.1
260	442	10.0	4.6	5.0	2.3
280	476	10.8	4.8	5.4	2.4
300	510	11.6	5.2	5.8	2.6
320	544	12.4	5.6	6.2	2.8
340	578	13.0	6.0	6.5	3.0
360	612	13.8	6.2	6.9	3.1
380	646	14.6	6.6	7.3	3.3
≥400	≥680	15.4	7.0	7.7	3.5

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

[. . .]

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

(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

INFORMATIVE APPENDIX A
EXPLANATORY MATERIAL

This informative appendix is not part of the standard. It provides explanatory information related to provisions in the standard. Sections of the standard with associated explanatory information in this appendix are marked with an asterisk "*" after the section number, and the associated appendix information is located in a corresponding section number preceded by "A".

[. . .]

Section 9.5

The *refrigerant* allowed in a *dispersal volume*, *M*, in a single *refrigeration system* using an A2L *refrigerant* in Tables 9-3 and Table 9-4 is calculated using Equation A-3 or A-4 for *refrigeration systems* with *circulation*, and Equation A-5 or A-6 for *refrigeration systems* without *circulation*.

~~$$M = \text{SF} \times LFL \times h \times \text{Area} \quad \text{(A-3)}$$~~

$$M = LFL \times h \times \text{Area} / \text{SF} \quad \text{(A-3)}$$

~~$$\text{Area} = \frac{M \times \text{SF}}{\text{SF} \times LFL \times h} \quad \text{(A-4)}$$~~

$$\text{Area} = \frac{M \times \text{SF}}{LFL \times h} \quad \text{(A-4)}$$

where

SF = safety factor; default value, 2~~4~~

h = dispersal ~~*space*~~ height, 7.2~~9.0~~ ft (2.2~~2.74~~ m)

$$M = 2.5 \times (LFL)^{(5/4)} \times h \times (\text{Area})^{(1/2)}\text{, not to exceed Equation A-3} \quad \text{(A-5)}$$

$$\text{Area} = [M/(2.5 \times (LFL)^{(5/4)} \times h)]^2\text{, not less than Equation A-4} \quad \text{(A-6)}$$

In the case where *ventilation* is present, the additional allowable charge in Table 9-4 is calculated using Equation A-7~~A-5~~ or A-8~~A-6~~.

$$\text{MV} = \frac{Q \times 4 \times LFL}{SF \times 60} \quad \text{(A-7~~A-5~~)}$$

$$Q = \frac{\text{MV} \times \text{SF} \times 60}{4 \times LFL} \quad \text{(A-8~~A-6~~)}$$

where

Q = mechanical *ventilation* airflow, m^3/h

SF = safety factor; a value of 2 for systems with *circulation* and a value of 4 for systems without *circulation* ~~default value, 4~~

60 = conversion factor from minutes to hours

4 = assumed leak time (4 minutes)

[. . .]

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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