



ADDENDA

**ANSI/ASHRAE Addendum o to
ANSI/ASHRAE Standard 15-2022**

Safety Standard for Refrigeration Systems

Approved by ASHRAE and the American National Standards Institute on July 31, 2024.

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Cognizant TCs: 10.1, Custom Engineered Refrigeration Systems, and 9.1, Large Building Air-Conditioning Systems

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FOREWORD

In response to a continuous maintenance proposal, Addendum o revises portions of Standard 15 related to ventilation of machinery rooms.

Informative Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum o to Standard 15-2022

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

8. INSTALLATION RESTRICTIONS

[...]

8.9 Refrigerating Machinery Room, General Requirements.

[...]

8.9.5 Each refrigerating *machinery room* shall contain a ~~detector~~ *refrigerant detector*, located in an area where *refrigerant* from a leak will concentrate, that actuates an alarm and mechanical ventilation in accordance with Section ~~8.9.7~~ *8.9.6* at a set point not greater than the *occupational exposure limit (OEL)* value as published in ASHRAE Standard 34³. [...]

[...]

8.9.6* *Machinery rooms*, in accordance with Section 8.9, shall be vented to the outdoors; using mechanical ventilation in accordance with Sections 8.9.7 and 8.9.8. The air temperature within the machinery room shall not exceed 122°F (50°C).

8.9.7 Mechanical ventilation referred to in Section 8.9.6 shall be by one or more power-driven fans capable of exhausting air from the machinery room at least in the amount given in the formula in Section 8.9.8. To obtain a reduced airflow for normal ventilation, multiple fans or multispeed fans shall be used. Provision shall be made for inlet air to replace that being exhausted. Openings for inlet air shall be positioned to avoid recirculation. Air supply and exhaust ducts to the machinery room shall serve no other area. The discharge of the air shall be to the outdoors in such a manner so as not to cause a nuisance or danger. The mechanical exhaust inlets shall be located in an area where refrigerant from a leak is likely to concentrate, in consideration of the location of the replacement air paths, refrigerating machines, and the density of the refrigerant relative to air.

8.9.7* General. Mechanical ventilation referred to in Section 8.9.6 shall comply with the following:

- a. Include one or more fans capable of exhausting air from the machinery room.
- b. Include makeup air provisions to replace air being exhausted.
- c. Ducts for supply to and exhaust from the machinery room shall serve no other space.
- d. The makeup air supply locations in the machinery room shall be positioned relative to the exhaust opening locations within the machinery room to avoid short-circuiting of ventilation airflow within the machinery room.
- e. Inlets to exhaust openings or ducts shall be located where leaked refrigerant will concentrate.
- f. The bottom edges of inlets to exhaust openings or ducts shall be within 1.00 ft (0.30 m) of the floor at locations identified per Section 8.9.7(e).
- g. Where the machinery room contains refrigerants with relative molar mass less than 42.0, additional inlets to exhaust openings or ducts shall be within 1.00 ft (0.30 m) of the highest point of the machinery room.
- h. The discharge of the exhaust air shall be to the outdoors in such a manner so as not to cause a nuisance or danger.
- i. Mechanical ventilation systems used to exhaust refrigerant shall not be combined with combustion venting systems.

8.9.8 Ventilation Airflow. For Group A1, A2, A3, B1, B2, and B3, For *machinery rooms* containing only Group A1 or B1 *refrigerants*, or containing any A2, A3, B2, or B3 *refrigerants*, the airflow shall comply with Section 8.9.8.1 and 8.9.8.2.

8.9.8.1 When personnel are present, the *machinery room* mechanical ventilation in Section 8.9.7 shall automatically or manually exhaust at an airflow rate not less than 0.50 ft³/min/ft² (0.0025 m³/s/m²) of *machinery room area*.

8.9.8.2 When triggered by the *refrigerant detector* of Section 8.9.5, the *machinery room* shall be ventilated automatically to supply not less than the airflow calculated using Equation 8-1a or 8-1b: The mechanical ventilation required to exhaust an accumulation of *refrigerant* due to leaks or a rupture of the refrigeration system shall be capable of removing air from the *machinery room* in not less than the quantity calculated using Equation 8-1a or 8-1b:

$$Q = 100 \times G^{0.5} \quad (8-1a \text{ [I-P]})$$

$$Q = 0.070 \times G^{0.5} \quad (8-1b \text{ [SI]})$$

where

Q = airflow, ft³/min (m³/s)

G = mass of *refrigerant* in the largest refrigeration system (*independent circuit*), any part of which is located in the *machinery room*, lb (kg)

A part of the refrigerating *machinery room* mechanical ventilation shall be

- a. operated, when occupied, to supply at least 0.5 ft³/min/ft² (0.00254 m³/s/m²) of *machinery room area* or 20 ft³/min (0.00944 m³/s) per person and
- b. operable when occupied at a volume required to not exceed the higher of a temperature rise of 18°F (10°C) above inlet air temperature or a maximum temperature of 122°F (50°C).

8.9.9 No open flames that use combustion air from the *machinery room* shall be [. . .]

8.10 Machinery Room, Special Requirements. In cases *specified* in the rules of Section 7.4, a refrigerating *machinery room* shall meet the following special requirements in addition to those in Section 8.9:

[. . .]

8.11 Machinery Room, Special Requirements, A2L and B2L. ~~When~~ In cases *specified* in Section 7.4, and when a refrigeration system *refrigerating system* is located indoors, and a *machinery room* is required by Section 7.4.3, *machinery rooms* shall comply with Sections 8.11.1 through 8.11.7 8.11.10 in addition to Sections 8.9.1 through 8.9.4.

8.11.1* The air temperature within the *machinery room* shall not exceed 122°F (50°C). There shall be no flame-producing device or hot surface over 1290°F (700°C) in the room, other than that used for maintenance or repair, unless installed in accordance with Section 8.9.9.

[. . .]

8.11.11* Ventilation. *Machinery rooms*, in accordance with Section 8.11, shall be vented to the outdoors using mechanical ventilation in accordance with Sections 8.11.11.1 through 8.11.11.4.

8.11.11.1* Mechanical ventilation referred to in Section 8.11.11 shall be in accordance comply with all of the following:

- a. Include one or more ~~power-driven~~ fans capable of exhausting air from the *machinery room*; ~~multispeed fans shall be permitted.~~
- b. Electric motors driving fans shall not be placed inside ducts; fan rotating elements shall be nonferrous or nonsparking, or the casing shall consist of or be lined with such material.
- e. b. Include *makeup air* provisions to supply *makeup air* to replace that air being exhausted;
- c. ~~ducts~~ Ducts for supply to and exhaust from the *machinery room* shall serve no other ~~area~~ space;
- d. ~~The~~ The *makeup air* supply locations in the *machinery room* shall be positioned relative to the *makeup air* exhaust opening locations within the *machinery room* to avoid short circuiting of ventilation airflow within the *machinery room*.
- e. ~~Inlets to the exhaust openings or ducts shall be located in an area where leaked refrigerant from a leak will concentrate, in consideration of the location of the replacement supply air paths, refrigerating machines, and the density of the refrigerant relative to air.~~
- e. f. The bottom edges of inlets Inlets to exhaust openings or ducts shall be within 1-ft 1.00 ft (0.3 m 0.30 m) of the lowest point of the *machinery room* floor at locations identified per Section 8.11.11.1(c.) for *refriger-*

~~ants that are heavier than air and shall be within 1 ft (0.3 m) of the highest point for refrigerants that are lighter than air.~~

~~g. Where the machinery room contains refrigerants with relative molar mass less than 42.0, additional inlets to exhaust openings or ducts shall be within 1.00 ft (0.30 m) of the highest point of the machinery room.~~

~~f. h. The discharge of the exhaust air shall be to the outdoors in such a manner as not to cause a nuisance or danger.~~

~~i. Mechanical ventilation systems used to exhaust refrigerant shall not be combined with combustion venting systems.~~

~~j. Electric motors driving fans shall not be placed inside ducts; fan rotating elements shall be nonferrous or nonsparking, or the casing shall consist of or be lined with such material.~~

8.11.11.2 Level 1 Ventilation. ~~When personnel are present, The the~~ refrigerating machinery room mechanical ventilation in Section 8.11.11.1 shall automatically or manually exhaust at an airflow rate not less than $0.50 \text{ ft}^3/\text{min}/\text{ft}^2$ ($0.0025 \text{ m}^3/\text{s}/\text{m}^2$) of machinery room area shown in Table 8-2.

(Table 8-2 is deleted.)

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 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 triggered by the refrigerant detector of Section 8.11.8, at a set point and response time in accordance with Table 8-1, the machinery room shall be ventilated automatically to supply not less than the airflow 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 system, and the highest airflow quantity shall apply.

Ventilation reset shall be in accordance with the type of reset in Table 8-1. Manual-type ventilation reset shall have the reset located inside the refrigerating machinery room.

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

INFORMATIVE APPENDIX A EXPLANATORY MATERIAL

Sections of the standard with associated explanatory information in this appendix are marked with an asterisk "*" after the section number.

[. . .]

Section 8.9.6 and Section 8.11.11

Machinery rooms are typically provided with a ventilation system or mechanical cooling system or combination of both. When evaluating whether ventilation alone, without the use of mechanical cooling, is sufficient to maintain adequate ambient temperature in a machinery room, consult the annual 2% design dry-bulb temperature for the installation location. As the available supply air temperature during hot weather conditions approaches the temperature limit of the machinery room, the required airflow increases significantly, and the addition of mechanical cooling may be required.

Section 8.9.6 and Section 8.11.1

The limit of 122°F (50°C) is based on a safety margin to the 140°F (60°C) flame propagation test temperature used to determine flammability classification. Use of equipment marked for an ambient temperature rating in excess of 122°F (50°C) does not permit a higher allowable machinery room space temperature. Use of equipment marked for an ambient temperature rating of 104°F (40°C) will limit the allowable machinery room space temperature to 104°F (40°C).

The maximum temperature limit applies to the bulk air temperature, spatially averaged over a significant portion of the machinery room volume, and should not be evaluated locally in proximity to an exhaust outlet for an air-cooled electrical equipment or near other heat producing equipment.

Section 8.9.7(e) and Section 8.11.11.1(e)

When determining location(s) of makeup air supply and location(s) of exhaust intakes, the user should consider the resulting air paths and location(s) of refrigerating systems.

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