

1109.2.5 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 Section 713 of the International Building Code.

Exceptions:

1. Refrigeration systems using R-718 refrigerant (water).
2. Piping in a direct refrigeration system **using Group A1 refrigerant** where the refrigerant quantity does not exceed the limits of Table 1103.1 for the smallest occupied space through which the piping passes.
3. Piping located on the exterior of the building where vented to the outdoors.

Reason:

There is a significant problem with the shaft requirements of the 2021 and 2024 International Mechanical Code (IMC) for refrigerant piping which - according to the original proponent at the ICC - unintentionally codified a provision that requires ventilated and drained fire-resistance rated shafts for Group A2L refrigerant piping - regardless of the quantity of refrigerant in the piping - where the piping penetrates two or more floor/ceiling assemblies.

Regarding Exception 2, IMC Table 1103.1, Refrigerant Classification, Amount and OEL provides limits for the quantity of refrigerant that can be released to the atmosphere without creating a fire or human health hazard. IMC Table 1103.1 is duplicated from ASHRAE Standard 34, Designation and Safety Classification of Refrigerants Table 4-1, Refrigerant Data and Safety Classifications.

Restricting the shaft exception to systems using Group A1 refrigerants is inconsistent with the safe limits premise of IMC Table 1103.1 and Standard 34, Table 4-1. There is no need to restrict the use of any refrigerant provided the release of which does not exceed the tabular safety limits.

1109.3.2 Shaft ventilation.

Refrigerant Required refrigerant pipe shafts with systems using Group A2L or B2L refrigerant shall be naturally or mechanically ventilated. Refrigerant pipe shafts with one or more systems using any Group A2, A3, B2 or B3 refrigerant shall be continuously mechanically ventilated and shall include a refrigerant detector. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Naturally ventilated shafts shall have a pipe, duct or conduit not less than 4 inches (102 mm) in diameter that connects to the lowest point of the shaft and extends to the outdoors. The pipe, duct or conduit shall be level or pitched downward to the outdoors. Mechanically ventilated shafts shall have a minimum airflow velocity in accordance with Table 1109.3.2. The mechanical ventilation shall be continuously operated or activated by a refrigerant detector. Systems utilizing a refrigerant detector shall activate the mechanical ventilation at a maximum refrigerant concentration of 25 percent of the lower flammable limit of the refrigerant. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The shaft shall not be required to be ventilated for double-wall refrigerant pipe where the interstitial space of the double-wall pipe is vented to the outdoors.

Reason:

This is a companion proposal to a proposal to amend IMC Section 1109.2.5 to allow exception 2 for all refrigerants as is permitted by ASHRAE 15-2022, Safety Standard for Refrigeration Systems, and will be permitted by the 2027 IMC (M75-24 is on the consent agenda for the 2027 IMC). If that proposal is accepted many refrigerant pipe shafts for A2L refrigerants would no longer be required because the maximum amount of refrigerant that could be released would be within the safe release limits specified by the IMC in Table 1103.1.

Where no shaft is required, A2L refrigerant piping could be run through stud cavities as permitted by Sec. 1109.2.2. (Note that Sec. 1109.3 requires that A2L piping systems comply with the provisions of Sec. 1109.3.1 for protection against physical damage).

If a shaft is not required, but the designer chooses to run A2L refrigerant piping in a shaft anyway for ease of construction, the requirements of Sec. 1109.3.2 should not apply. A refrigerant leak in a non-required shaft would be no more hazardous than a refrigerant leak in a stud cavity. If the stud cavity would not require ventilation and drainage, then a non-required shaft should not require ventilation and drainage

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Naturally ventilated shafts shall have a pipe, duct or conduit not less than 4 inches (102 mm) in diameter that connects to the lowest point of the shaft and extends to the outdoors. The pipe, duct or conduit shall be level or pitched downward to the outdoors. Mechanically ventilated shafts shall have a minimum airflow velocity in accordance with Table 1109.3.2. The mechanical ventilation shall be continuously operated or activated by a refrigerant detector. Systems utilizing a refrigerant detector shall activate the mechanical ventilation at a maximum refrigerant concentration of 25 percent of the lower flammable limit of the refrigerant. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The shaft shall not be required to be ventilated for double-wall refrigerant pipe where the interstitial space of the double-wall pipe is vented to the outdoors. **For refrigeration systems used in residential occupancies serving only a single dwelling unit or sleeping unit, shaft ventilation shall not be required where the pipe or tube is continuous without fittings in the shaft.**

Reason:

The proposed language is taken from code change M62-24 which passed the ICC's IMC hearing committee by 13-1 and which received no public comments. M62-24 is therefore on the consent agenda for the 2027 IMC and will be the content of the 2027 IMC.

This language is also consistent with provisions addressing shaft ventilation in Section 8.5.2.2 of ASHRAE 15.2-2022, Safety Standard for Refrigeration Systems in Residential Applications and Addendum a to ASHRAE 15-2024, Safety Standard for Refrigeration Systems.

Table 1103.1

Please see the attached ICA-TSG-000001 - Toto - ASHRAE - 2024 IMC (5th page) for list of refrigerants that need critical date updated for several A2L refrigerants.

Reason:

Errors exist in Table 1103.1 in the 2024 IMC. These errors came from ASHRAE 34-2022 and have been corrected in ASHRAE 34-2024. These refrigerants have been approved for the 2027 IMC using the ASHRAE 34-2024 as a referenced stand in Chapter 15. Ohio has also noted that it intends to amend Chapter 15 in the IMC to update ASHRAE 15-2022 to the ASHRAE 15-2024 and ASHRAE 34-2022 to the ASHRAE 34-2024. While we agree with referencing these latest ASHRAE standards, Table 1103.1 in the 2024 IMC still contains errors. This proposal is to update those refrigerants to the corrected values as noted in the ICA - TSG-000001 - Toto - ASHRAE - 2024 IMC.

CHAPTER 15

REFERENCED STANDARDS

ASHRAE

ASHRAE
1791 Tullie Circle, NE
Atlanta, GA 30329

15—~~2022~~2024

Safety Standard for Refrigeration Systems
1101.1.1, 1106.4.2, 1106.4.3, 1110.6

34—~~2022~~2024

Designation and Safety Classification of Refrigerants
202, 1102.2.1, 1103.1

Reason:

The 2024 editions of ASHRAE 15 and ASHRAE 34 contain many updates that are significant to the use of A2L refrigerants. ASHRAE 34-2024 corrects numerous errors in the refrigerant table from the 2022 edition. ASHRAE 15-2024 contains key updates including requirements for pressure relief devices, refrigeration detection systems, using consistent terminology, and further harmonizes with ASHRAE 34.

CHAPTER 44

REFERENCED STANDARDS

ASHRAE

ASHRAE
1791 Tullie Circle, NE
Atlanta, GA 30329

34—~~2022~~2024

Designation and Safety Classification of Refrigerants
M1411.1

Reason:

With the change to Low GWP Refrigerants, the Residential Code needs to be updated to address the use of Group A2L refrigerants in high probability (direct) systems. All of the commonly used Low GWP replacement refrigerants for direct systems fall into the category of Group A2L in the 2024 edition of ASHRAE 34. The 2024 edition of ASHRAE 34 also corrects errors in the refrigerant table from the 2022 edition.