1 RCNY §7011-01

CHAPTER 7000

Mechanical Code

§7011-01 A2L Refrigerating Systems.

(a) Scope. Pursuant to footnote c of Table 1103.1 of the New York City Mechanical Code (MC), all refrigerating systems utilizing refrigerants classified into safety group "A2L" by the 2022 edition of American Society of Heating, Refrigerating and Air-Conditioning Engineers ("ASHRAE") 34 installed after the effective date of this rule must comply with the requirements of this section.

(b) References. See MC Sections 102.4, 1101.6, 1101.8, 1101.11, 1102.2, 1104.2, 1105.3, 1105.7, 1105.8, 1105.9, 1105.11 and 1108.1

(c) General.

(1) Applicability. Group A2L refrigerating systems must conform to the specific provisions of the 2022 edition of ASHRAE 15 as adopted and modified by Section 7015-02. ASHRAE 15 provisions apply pursuant to Section MC 102.8. Except otherwise stated, ASHRAE 15 does not apply to residential refrigeration systems complying with ASHRAE 15.2 as modified by 7015-03.

(2) Changing refrigerant. Refer to ASHRAE 15 Section 5.3.

(3) Signs, nameplates, and operation and emergency shut-down instructions. Signs and identification for Group A2L refrigerant must comply with ASHRAE 15 Section 10.1. Emergency shutdown procedures, including instructions, must comply with ASHRAE 15 Section 10.6. Nameplates must comply with ASHRAE 15 Section 9.17.

(d) System requirements.

(1) Refrigerants. Refrigerants having a Safety Group Classification of A2L not identified in MC Table 1103.1, but listed in ASHRAE 34 Table 4-1 and 4-2, are not required to be approved by the department before use.

(2) Refrigerant Detection System Requirements.
When required by Section 7.6.2.3 of ASHRAE 15 for refrigeration systems for human comfort applications or Section 7.7.3.3 of ASHRAE 15 for refrigeration systems other than human comfort applications, refrigeration systems having refrigerants in Safety Group Classification A2L must have an integral refrigerant detection system. Such refrigerant detection systems must comply with Section 7.6.2.4 of ASHRAE 15.

(3) Mitigation Action Requirements. Mitigation actions must be provided in accordance with section 7.6.2.5 of ASHRAE 15.

(4) Release Mitigation Controls. Release mitigation controls may be used to reduce the releasable charge in accordance with 7.3.4 and 7.6 of ASHRAE 15 such that the Mitigation Releasable Refrigerant Charge (Mrel) as calculated in 7.3.4.3 is less than or equal to the Effective Dispersal Volume Charge (EDVC) calculated in 7.6.

(e) Refrigeration system classification. Refrigerants in safety group "A2L" must be classified in ASHRAE 34, Table 4-1 and 4-2.

(f) System application requirements.

(1) Refrigerant restrictions. The use of the term "natural ventilation" in Section 7 of ASHRAE 15 is not construed to require outside air.

(2) Allowable refrigerant charges for human comfort. Allowable refrigerant charge volumes for high-probability direct systems utilizing A2L refrigerants must be calculated in accordance with ASHRAE 15, Section 7.6. For a space having only recirculating air conditioning unit(s), with no adjoining spaces and with no outside air introduced by ductwork, ASHRAE 15 section 7.6.1.2 must be used to calculate the maximum refrigerant charge of such unit's independent circuit in conjunction with the definition of "Air Circulation" in section 7015-02 of these rules.

(3) Allowable refrigerant charges for other than human comfort. Allowable refrigerant charge volumes for high-probability direct systems utilizing A2L refrigerants must be calculated in accordance with ASHRAE 15 Section 7.7.

(g) Machinery room.

(1) Machinery room. Where refrigerants in safety group A2L are used in machinery rooms, such machinery rooms must be designed to comply with the applicable requirements of Section 8.9 and 8.11 of ASHRAE 15.

(2) Emergency pressure control system. Permanently installed refrigeration systems containing more than 6.6 pounds (3 kg) of A2L refrigerant are not required to be provided with an emergency pressure control system.

(3) Refrigerant detector. When refrigerants in safety group A2L are used, the machinery room must be provided with a refrigerant detection system in accordance with Section 8.11 of ASHRAE 15 and the following:

(i) An emergency alarm "FDNY Alarm" must generate an output signal in no more than 30 seconds when exposed to a refrigerant concentration exceeding 25% of the lower flammability limit (LFL) or when it reaches the upper detection limit of the refrigerant detector, whichever is lower, start level 2 ventilation in accordance with ASHRAE 15, and automatically de-energize the following equipment in the machinery room:

(A) Refrigerant compressors,
(B) Refrigerant pumps,
(C) Normally closed automatic refrigerant valves,
(D) Other unclassified electrical sources of ignition with apparent power rating greater than 1 kVA, where the apparent power is the product of the circuit voltage and current rating.

(ii) A trouble Alarm "FDNY Fault" must generate an output signal when the detection of refrigerant concentration reaches a concentration equal to the occupational exposure limit (OEL) value for such refrigerant as published in ASHRAE 34 and start level 1 ventilation in accordance with ASHRAE 15.

(iii) A supervisory alarm "FDNY Supervisory" must generate an output signal when the detector identifies a malfunctioning component within the system that needs immediate attention.

(iv) The set points for "trouble alarm" and "emergency alarm" must be in accordance with Table 8-1 of ASHRAE 15.

(v) All alarms must annunciate at both a refrigerant detection panel inside the machinery room and at an annunciator panel located outside the machinery room. The annunciator panel located outside the machinery room must display the same information in the panel located inside the machinery room and be installed within 10 feet of the machinery room entrance door, on the premises.

(vi) When refrigerant detectors are installed in buildings without fire alarm systems, such refrigerant detection system must be monitored at a continuously attended location, on the premises, by a person holding a Certificate of Fitness issued by the New York City Fire Department ("FDNY") or by an FDNY approved central supervising station with refrigerant detection alarm, supervisory, and trouble signals being transmitted as separate and distinct signals to such FDNY approved central station.

(vii) When refrigerant detectors are installed in buildings with fire alarm systems, such refrigerant detector system may be used in multi-hazard applications.

(viii) When refrigerant detectors are installed in buildings with a building-wide fire alarm system, the refrigerant detector control panel must be monitored by such building-wide fire alarm system and the following signals must be transmitted to the building-wide fire alarm control panel (fire command center or station):

(A)Emergency Alarm "FDNY Alarm"
(B)Supervisory signal "FDNY Supervisory"
(C)Trouble Alarm "FDNY Fault"

Each alarm input to the control unit, whether emergency, supervisory or trouble alarm, must be transmitted to the building-wide fire alarm control panel (fire command center or station) at a discrete point, if the building-wide fire alarm system is capable, and the location of an operated initiating device must be visibly indicated by floor, fire zone, or other approved subdivision.

(ix) Where a building is provided with emergency power, refrigerant detection systems must be connected to such emergency power. Where a building is not otherwise provided with emergency power, the power source for emergency power to a refrigerant detection system must be served by an uninterruptable power source (UPS).

(h) Refrigerant piping safety for all group A2L refrigerating systems. Where refrigerant piping penetrates floors, ceilings, or roofs pursuant to Section 1107.2.3 of the NYC Mechanical Code, it must comply with the requirements of paragraphs (1) through (5) of this subdivision.

(1) Refrigerant piping systems, including but not limited to stop valve, and piping identification must comply with the requirements of ASHRAE 15 section 9.12.

(2) Refrigerant quantity limits must comply with the requirements of ASHRAE 15 section 7.6 or 7.7.

(3) Effective dispersal volume (EDV) calculations for rooms not connected to other spaces must comply with section 7.2.3.1 of ASHRAE 15 and must be performed for all spaces other than shafts through which refrigerant piping passes, regardless of whether such space is served by the system.

Exception: Rooms not connected to other spaces are exempt from EDV calculation in accordance with section 7.2.3.1 if such refrigerant piping and fittings are enclosed in an outer sleeve consisting of piping of the same material. The outer sleeve must be able to hold the design working pressure of the system. Press-fit couplings may be used. In addition to the outer containment piping, refrigerant piping must be further enclosed in construction having a 2-hour fire-resistance rating.

(4) EDVC calculation in connected spaces.

(i) Where spaces are connected via natural ventilation, the size of the opening and EDVC must be calculated in accordance with ASHRAE 15 section 7.2.3.2

(ii) Where spaces are connected via ducted air distribution system, the EDVC must be calculated in accordance with ASHRAE 15 section 7.2.3.3

(iii) Where spaces are connected via mechanical ventilation, the EDVC must be calculated in accordance with ASHRAE 15 section 7.2.3.4

(5) Location. Refrigerant piping for Group A2L refrigerants must comply with the location requirements of Section 9.12 of ASHRAE 15.

Exception: Refrigerant piping for Group A2L refrigerant may be installed in public corridors if such refrigerant piping and fittings are enclosed in an outer sleeve consisting of piping of the same material. The outer sleeve must be able to hold the design working pressure of the system. Press-fit couplings may be used. In addition to the outer containment piping, refrigerant piping must be further enclosed in construction having a 2-hour fire-resistance rating.

(i) Testing and inspection.

(1) Testing of refrigerating system and its components must be performed in accordance with ASHRAE 15 section 9.13 and 9.14. Such test must be witnessed by a special inspector.

(2) Special inspections must be conducted in accordance with 2022 NYC Building Code 1705.21.