City of Philadelphia

City Council
Chief Clerk's Office
402 City Hall
Philadelphia, PA 19107

BILL NO. 260391

Introduced April 23, 2026

Councilmember Driscoll for Council President Johnson

**Referred to the
Committee on Licenses and Inspections**

AN ORDINANCE

Amending Title 4 of The Philadelphia Code, entitled "The Philadelphia Building Construction and Occupancy Code," by amending Subcode "M" (The Philadelphia Mechanical Code) and adopting the 2021 edition of the "International Mechanical Code," as published by the International Code Council, with amendments thereto, as authorized by the Pennsylvania Uniform Construction Code Act, all under certain terms and conditions.

THE COUNCIL OF THE CITY OF PHILADELPHIA HEREBY ORDAINS:

SECTION 1. The contents of Subcode "M" of Title 4 of The Philadelphia Code, entitled "The Philadelphia Mechanical Code," are hereby deleted and replaced with the following:

SUBCODE "M" (THE PHILADELPHIA MECHANICAL CODE)

Article M-1.0 Adoption of the "2021 International Mechanical Code," pursuant to the Pennsylvania Uniform Construction Code Act ("Act"), with state amendments and local amendments that were in effect prior to enactment of the Act or approved pursuant to Section 503 of the Act.

§ M-1.1 The "2021 International Mechanical Code," as published by the International Code Council, is hereby adopted as the Mechanical Code of the City of Philadelphia and is incorporated as if fully set forth herein, subject to the amendments provided in this Subcode M.

§ M-1.1.1 The numbers of all local amendments shall be preceded with the prefix "M-".

§ M-1.1.2 Throughout the code, references to "International" codes or "ICC" codes shall be deemed to refer to the "Philadelphia" codes of the same name.

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CHAPTER 1
SCOPE AND ADMINISTRATION

[Delete contents of entire Chapter and replace as follows:]

SECTION M-101 GENERAL

M-101.1 Title. These provisions shall be known as the Philadelphia Amendments to the International Mechanical Code, and will be referred to herein as the "Philadelphia Mechanical Code" or "this code".

M-101.2 Scope. The Philadelphia Mechanical Code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed herein. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the Philadelphia Fuel Gas Code (Subcode G).

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the Philadelphia Residential Code (Subcode R).

M-101.3 Appendices. No appendices are adopted as a part of this code.

M-101.4 Intent. The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of mechanical systems.

M-101.5 Administrative provisions. This Chapter contains those provisions that are unique to the administration of this code. All other administrative provisions applicable to this code are as set forth in the Administrative Code.

M-101.6 Conflicts. Pursuant to the Pennsylvania Uniform Construction Code Act, a provision of the "'International Mechanical Code" does not apply if the provision conflicts with the Boiler and Unfired Pressure Vessel Law (35 P. S. §§ 1331.1 – 1331.9).

SECTION M-102 INSPECTIONS AND TESTING

M-102.1 Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed work and the issuance of a permit, the code official shall require the submittal of an evaluation report from an approved agency on each prefabricated construction assembly. The report shall indicate the complete details of the mechanical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information and other data as necessary for the code official to determine conformance to this code.

Exception: Manufactured and Industrialized housing pursuant to Section A-102.12 of the Administrative Code.

M-102.1.1 Follow-up inspection. Except where ready access is provided to mechanical systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct in-plant inspections to ensure conformance to the approved evaluation report or shall accept inspection reports from an approved independent inspection agency. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request. The mechanical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

M-102.1.2 Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the mechanical system and the erection of the building; or such records as the code official designates shall be filed.

M-102.2 Testing. Mechanical systems shall be tested as required in this code and in accordance with Sections M-102.2.1 through M-102.2.3. Tests shall be made by the permit holder after notifying the code official, who shall have the authority to observe the tests.

M-102.2.1 New, altered, extended or repaired systems. New mechanical systems and parts of existing systems, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose leaks and defects.

M-102.2.2 Apparatus, instruments, material and labor for tests. Apparatus, instruments, material and labor required for testing a mechanical system or part thereof shall be furnished by the permit holder.

M-102.2.3 Reinspection and testing. Where any work or mechanical system does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or system shall then be reinspected or re-tested and the results resubmitted to the code official as appropriate.

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CHAPTER 3
GENERAL REGULATIONS

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SECTION 307 CONDENSATE DISPOSAL

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[Delete Section 307.2.1.1, and replace as follows:]

M-307.2.1.1 Disposal into Clothes Washer Box. Condensate shall be permitted to discharge into a clothes washer box with dual drainage outlets with one outlet dedicated to the clothes washer discharge and one outlet dedicated to condensate discharge. Condensate shall also be permitted to discharge into a clothes washer box with a single drainage outlet where the inlet of the clothes washer box outlet is sized to accommodate both the clothes washer discharge and the condensate discharge.

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CHAPTER 11
REFRIGERATION

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SECTION 1101 GENERAL

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[Add Section 1101.2.1 as follows:]

M-1101.2.1 Group A2L, A2, A3, and B1 high-probability equipment. High-probability equipment using Group A2L, A2, A3, or B1 refrigerant shall comply with UL 484, UL/CSA 60335-2-40, or UL/CSA 60335-2-89.

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SECTION 1103 REFRIGERATION SYSTEM CLASSIFICATION

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[Delete Table 1103.1 and replace as follows:]

TABLE M-1103.1 REFRIGERANT CLASSIFICATION, AMOUNT, AND OEL

City Council
Chief Clerk's Office
402 City Hall
Philadelphia, PA 19107

Chemical Refrigerant	Formula	Chemical Name of Blend	Refrigerant Safety Group Classification	Amount of Refrigerant Per Occupied Space							[F] Degrees of Hazard [a]
				RCL			LFL[f]			OEL [d]	
				Pounds per 1000 cubic feet	ppm	g/m³	Pounds per 1000 cubic feet	ppm	g/m³	ppm	
R-11 [c]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.1	-	-	-	1000	2-0-0[b]
R-12 [c]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	-	-	-	1000	2-0-0[b]
R-13 [c]	$CClF_3$	chlorotrifluoromethane	A1	-	-	-	-	-	-	1000	2-0-0[b]
R-13B1 [c]	$CBrF_3$	bromotrifluoromethane	A1	-	-	-	-	-	-	1000	2-0-0[b]
*	*	*	*	*							
R-32	CH_2F_2	difluoromethane (methylene fluoride)	A2L	0.8	36,000	77	19.1	144,000	306	1,000	1-4-0
*	*	*	*	*							
R-50	CH4	methane	A3	-	-	-	-	50,000	-	1000	-
R-113 [c]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20	-	-	-	1000	2-0-0[b]
R-114 [c]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140	-	-	-	1000	2-0-0[b]
*	*	*	*	*							
R-141b	CH_3CCl_2F	1,1,-dichloro-1-difluororethane	-	0.78	2,600	12	17.8	60,000	287	500	2-1-0

R-142b	CH_3CClF_2	1-chloro-1,1-difluoroethane	A2	5.1	20,000	82	20.4	80,000	329	1,000	2-4-0
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2L	4.4	21,000	70	17.5	82,000	282	1,000	2-0-0[b]
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	8.1	48,000	130	1,000	1-4-0
R-170	CH_3CH_3	ethane	A3	0.54	7,000	8.6	2.4	31,000	38	1,000	2-4-0
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	4	34,000	64	1,000	-
* * *											
R-290	$CH_3CH_2CH_3$	propane	A3	0.59	5,300	9.5	2.4	21,000	38	1,000	2-4-0
R-C318	$(CF_2)_4$	octafluorocyclobutane	A1	41	80,000	650	-	-	-	1,000	-
R-400[c]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	-	-	-	1,000	2-0-0[b]
R-400[c]	zeotrope	R-12/114 (60.0/40.0)	A1	11	30,000	170	-	-	-	1,000	-
* * *											
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	68,000	290	-	-	-	1,000	2-0-0[b]
* * *											
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	75	18.8	82,000	301.9	1,000	-
* * *											
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	94,000	330	-	-	-	1,000	2-0-0[b]
* * *											

R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	11.6[f]	55,000[f]	185.6[f]	970	-
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	14.8[f]	70,000[f]	283.3[f]	940	-
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	20.5[f]	87,000[f]	328.6[f]	1,000	-
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	93	23.4[f]	88,000[f]	376.9[f]	1,000	-
* * *											
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	11.7[g]	56,000[g]	187.9[g]	1,000	-
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	8.4	47,000	135.1	1,000	-
* * *											
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	3.5	13,000	55	-	-	-	1,000	2-0-0[b]
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	69	-	-	-	1,000	-
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	19.2[g]	89,000[g]	308.4[g]	1,000	-
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	16.7[g]	60,000[g]	268.6[g]	1,000	-
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	18.5[g]	69,000[g]	297.3[g]	1,000	-
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	44,000	180	-	-	-	1,000	2-0-0[b]
* * *											
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	300	-	-	-	1,000	2-0-0[b]

* * *											
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	3.2	25,000	83.8	1,000	-
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	5.2	32,000	44	1,000	-
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.68	5,500	11	2.7	22,000	38.6	1,000	-
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	2.4	22,000	39.2	550	-
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	2.4	20,000	32.4	760	-
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.39	3500	6.3	2.0	18,000	32.1	950	-
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.5	2.0	18,000	83.8	790	-
* * *											
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	1.1	8,500	17	4.3	34,000	68.2	1,000	-
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.5	4,000	8.1	2.0	16,000	32.3	1,000	-
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	2.0	16,000	32.7	1,000	-
* * *											
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	4.7	26,000	76	18.9	104,000	303.3	990	-
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	7.8[h]	46000[h]	124.7[h]	1,000	-
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	0.39	3,200	6.3	2.0	16,000	31.7	1,000	-
* * *											

R-443A	zeotrope	R-1270/290/600a (55.0/40.0/5.0)	A3	0.19	1,700	3.1	2.2	20,000	35.6	580	-
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2L	5.0	21,000	80	19.9	82,000	319.4	850	-
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2L	4.3	23,000	69	17.3	93,000	277.3	890	-
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2L	4.2	16,000	67	2.7	63,000	347.4	930	-
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2L	2.5	16,000	39	13.5	62,000	217.4	930	-
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2L	2.6	16,000	42	18.9	65,000	303.5	900	-
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2L	2.6	16,000	42	19.5	121,000	312.7	970	-
* * *											
R-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2L	5.0	18,000	81	20.3	70,000	326.6	520	-
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2L	5.0	18,000	81	20.3	70,000	326.6	530	-
* * *											
R-452B	zeotrope	R-32/125/1234yf (67.0/7.0/26.0)	A2L	4.8	30,000	77	19.3	119,000	310.5	780	-
* * *											
R-454A	zeotrope	R-32/1234yf (35.0/65.0)	A2L	3.2	16,000	52	18.3	63,000	293.9	690	-
R-454B	zeotrope	R-32/1234yf (68.9/31.1)	A2L	3.1	19,000	49	22	77,000	352.6	850	-

R-454C	zeotrope	R-32/1234yf (21.5/78.5)	A2L	4.4	19,000	71	18	62,000	289.5	620	-
R-455A	zeotrope	R-744/32/1234yf (3.0/21.5/75.5)	A2L	4.9	22,000	79	26.9	118,000	432.1	650	-
*	*	*									
R-457A	zeotrope	R-32/1234yf/152a (18.0/70.0/12.0)	A2L	3.4	15,000	54	13.5	60,000	216.3	650	-
*	*	*									
R-459A	zeotrope	R-32/1234yf/1234ze(E) (68.0/26.0/6.0)	A2L	4.3	27,000	69	17.4	107,000	278.7	870	-
R-459B	zeotrope	R-32/1234yf/1234ze(E) (21.0/69.0/10.0)	A2L	5.8	16,000	92	23.3	99,000	373.5	640	-
*	*	*									
R-462A	zeotrope	R-32/125/143a/134a/600 (9.0/42.0/2.0/44.0/3.0)	A2	3.9	16,000	62	16.6[f]	105000[f]	265.8[f]	1,000	-
*	*	*									
R-500[c]	zeotrope	R-12/152a (73.8/26.2)	A1	7.4	29,000	120	-	-	-	1,000	2-0-0[b]
R-501[c]	zeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	-	-	-	1,000	-
R-502[c]	zeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	-	-	-	1,000	2-0-0[b]
R-503[c]	zeotrope	R-23/13 (40.1/59.9)	-	-	-	-	-	-	-	1,000	2-0-0[b]
R-504[c]	zeotrope	R-32/115 (48.2/51.8)	-	28	140,000	450	-	-	-	1,000	-
*	*	*									

R-507A	zeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	510	-	-	-	1,000	2-0-0[b]
* * *											
R-509A	zeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	380	-	-	-	1,000	2-0-0[b]
R-510A	zeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	3.5	29,000	56.1	1,000	-
R-511A	zeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	2.4	21,000	38	1,000	-
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	7.7	45,000	123.9	1,000	-
* * *											
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	3.2	13,000	52	13.1	50,000	210.1	590	-
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	3.0	20,000	48	1,000	1-4-0
R-600A	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	9.5	2.4	16,000	38	1,000	2-4-0
R-601	$CH_2CH_2CH_2CH_2CH_3$	pentane	A3	0.18	1,000	2.9	2.2	12,000	35	600	-
R-601A	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	2.4	13,000	38	600	-
* * *											
R-744	CO_2	carbon dioxide	A1	3.4	30,000	54	-	-	-	5,000	2-0-0
R-1130 (E)	CHCI=CHCI	trans-1,2-dichloroethene	B2	0.25	1,000	4.0	16	65,000	258	200	-
R-1132A	$CF_2=CH_2$	1,1-difluoroethene	A2	2.0	13,000	33	8.1	50,000	131	500	-

R-1150	$CH_2=CH_2$	ethene (ethylene)	B3	-	-	-	2.2	31,000	36	200	1-4-2
* * *											
R-1234yf	$CF_3CH=CH_2$	2,3,3,3-tetrafluoro-1-propene	A2L	4.5	16,000	75	18	62,000	289	500	-
R-1234ze(E)	$CF_3CH=CFH$	trans-1,3,3,3-tetrafluoro-1 - propene	A2L	4.7	16,000	76	18.8	65,000	303	800	-
* * *											
R-1336mzz(Z)	$CF_3CHCHCF_3$	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	5.2	13000	84	-	-	-	500	-

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m^3.

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.

b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.

c. Class I ozone depleting substance; prohibited for new installations

d. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the TERA WEEL or consistent value on a time-weighed average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.

e. LFL is based on the Worst Case of Formulation for Flammability (WCF) @ 73.4°F (23°C) unless otherwise noted.

f. Worst Case of Fractionation for Flammability (WCFF) LFL @ 140°F (60°C).

g. WCFF LFL @ 73.4°F (23°C)

h. WCF LFL @ 212°F (100°C).

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SECTION 1104 SYSTEM APPLICATION REQUIREMENTS

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[Delete Section 1104.3.1 and replace as follows:]

M-1104.3.1 Air Conditioning for human comfort. High-probability systems used for human comfort shall use Group A1 and A2L refrigerant.

Exceptions:

1. Equipment listed for and used in residential occupancies containing a maximum of 6.6 pounds (3 kg) of refrigerant.
2. Equipment listed for and used in commercial occupancies containing a maximum of 22 pounds (10 kg) of refrigerant.
3. Industrial occupancies.

[Delete Section 1104.3.2 and replace as follows:]

M-1104.3.2 Group A2, A3, and B3 refrigerants. Group A2 and B2 refrigerants shall not be used in high probability systems. Group A3 and B3 shall not be used except where approved.

Exceptions: This section does not apply to:

1. Laboratories where the floor areas per occupant is not less than 100 square feet (9.3 m^2).
2. Listed self-contained systems having a maximum of 0.331 pounds (150 G) of Group A3 refrigerant.
3. Industrial Occupancies.
4. Equipment listed for and used in residential occupancies containing a maximum of 6.6 pounds (3 kg) of Group A2 or B2 refrigerant.
5. Equipment listed for and used in commercial occupancies containing a maximum of 22 pounds (10 kg) of Group A2 or B2 refrigerant.

[Delete Table 1104.3.2 in its entirety, without substitution.]

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SECTION 1106 MACHINERY ROOMS, GENERAL REQUIREMENTS

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[Delete Section 1106.3 and replace as follows:]

M-1106.3 Class 2 and Class 3 refrigerants. Where refrigerants of Groups A2, A3 and B3 are used, the machinery room shall conform to the Class 1. Division 2, hazardous location classification requirements of NFPA 70.

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[Delete Section 1106.4 in its entirety, including Table 1106.4.2, and replace as follows:]

M-1106.4 Group A2L and B2L Refrigerant. Machinery rooms for Group A2L and B2L refrigerant shall comply with Sections 1106.4. through Section 1106.4.3.

M-1106.4.1 Elevated Temperatures. Open flame-producing devices or continuously operating hot surfaces over 1290°F (700°C) shall not be permanently installed in the room.

M-1106.4.2 Refrigerant detector. In addition to the requirements of Section 1105.3, refrigerant detectors shall signal an alarm and activate the ventilation system in accordance with the response time specified in Table 1106.4.2.

Table M-1106.4.2

Group A2L and B2l Detector Activation

Activation Level	Maximum Response Time (seconds)	ASHRAE 15 Ventilation Level	Alarm Reset	Alarm Type
Less than or equal to the OEL in Table 1103.1	300	1	Automatic	Trouble

Less than or equal to the refrigerant concentration level in Table 1103.1	15	2	Manual	Emergency

M-1106.4.3 Mechanical Ventilation. The machinery room shall have a mechanical ventilation system complying with ASHRAE 15.

* * *

SECTION 1107 PIPING MATERIAL

* * *

[Delete Table 1107.4 and replace as follows:]

TABLE M-1107.4 REFRIGERANT PIPE

PIPING MATERIAL	STANDARD
Aluminum tube	ASTM B210/ASTM B210M, ASTM B491M
Brass (copper alloy) pipe	ASTM B43
Copper linesets	ASTM B280, ASTM B1003
Copper pipe	ASTM B42, ASTM B302
Copper tube[a]	ASTM B68, ASTM B75, ASTM B88, ASTM B280, ASTM B819
Steel pipe[b]	ASTM A53, ASTM A106, ASTM A333
Steel tube	ASTM A254, ASTM A334

a. Soft annealed copper tubing larger than 1 3/8-inch (35 mm) O.D. shall not be used for field assembled refrigerant piping unless it is protected from mechanical damage.
b. ASTM A53, Type F steel pipe shall only permitted for discharge lines in pressure relief systems.

* * *

[Delate Table 1107.5 and replace as follows:]

TABLE M-1107.5 REFRIGERANT PIPE FITTINGS

FITTING MATERIAL	STANDARD

Aluminum	ASTM B361
Copper and Copper Alloy (Brass)	ASME B16.15, ASME B16.18, ASME B16.22, ASME B16.24, ASME B16.26, ASME B16.50
Steel	ASTM A105, ASTM A181, ASTM A193, ASTM A234, ASTM A420, ASTM A707

* * *

[Delete Section 1107.7 and replace as follows:]

M-1107.7 Flexible connectors, expansion and vibration compensators. Flexible connectors and expansion and vibration control devices shall be listed and labeled for use in refrigerant systems and pressures for which the components are installed.

* * *

SECTION 1109 REFRIEGERANT PIPE INSTALLATION

* * *

[Delete Section 1109.2.2 and replace as follows:]

M-1109.2.2 Refrigerant and pipe enclosure. Refrigerant piping shall be protected by locating it within the building elements or within protective enclosures.

Exception: Piping protection within the building elements or protective enclosure shall not be required in any of the following locations:

1. Where installed without ready access or located more than 7 feet 3 inches (2210 mm) above the finished floor.
2. Where located within 6 feet (1829 mm) of the refrigerant unit or appliance.
3. Where located in a machinery room complying with Section 1105.
4. Outside the building:
   1.1 Protected from damage from the weather, including but not limited to, hail, ice, and snow loads and

1.2 Protected from damage within the expected foot or traffic path or
1.3 Outside, underground, installed not less than 8 inches (200 mm) below finished grade and protected against corrosion.

[Delete Section 1109.2.3 and replace as follows:]

M-1109.2.3 Prohibited Locations. Refrigerant piping shall not be installed in any of the following locations:

1. Exposed within a fire resistance-rated exit access corridor.
2. Exposed within an interior exit stairway.
3. Within an interior exit ramp
4. Within an exit passageway
5. Within an elevator, dumbwaiter or other shaft containing a moving object.

* * *

[Delete Section 1109.2.5 and replace as follows:]

M-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 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.

* * *

[Delete Section 1109.2.6 and replace as follows:]

M-1109.2.6 Exposed piping surface temperature. Exposed piping with ready access to nonauthorized personnel having surface temperatures greater than 120°F (69°C) or less than 5°F (-15°) shall be protected from contact or shall have thermal insulation that limits the exposed insulation surface temperature to a range of 5°F (-15°C) to 120°F (69°C).

* * *

[Delete Section 1109.2.7 and replace as follows:]

M-1109.2.7 Pipe identification. Refrigeration pipe located in areas other than the room or space where the refrigerating equipment is located shall be identified. The pipe identification shall be located at intervals not exceeding 20 feet (6096 mm) on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be ½ inch (12.7 mm). The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2L and B2L refrigerants, the identification shall also include the following statement: "WARNING – Risk of Fire. Flammable Refrigerant." For Group A2, A3, B2 and B3 refrigerants, the identification shall also include the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For any Group B refrigerant, the identification shall also include the following statement: "DANGER – Toxic Refrigerant."

* * *

[Delete Section 1109.3 and replace as follows, but leave Table 10.9.3.2 unchanged:]

M-1109.3 Installation requirements for Group A2L, A2, A3, B2L, B2, or B3 refrigerant. Piping systems using Group A2L, A2, A3, B2L, B2, or B3 refrigerant shall comply with the requirements of Section 1109.3.1 and 1109.3.2.

M-1109.3.1 Pipe Protection. In addition to the requirements of Section 305.5, aluminum, copper, and steel tube used for Group A2, A3, B2L, B2, and B3 refrigerants and located in concealed locations where tubing is installed in studs, joists, rafters or similar member spaces, and located less than 1½ inches (38 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.46 mm) (No. 16 gage) shall cover the area of the tube plus the areas extending not less than 2 inches (51 mm) beyond both sides of the tube.

M-1109.3.2 Shaft ventilation. 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 refrigerator. 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.

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[Delete Section 1109.4 in its entirety, without substitution]

* * *

[Delete Section 1109.7 in its entirety, without substitution]

* * *

SECTION 1110 REFRIGERATION PIPING SYSTEM TEST

* * *

[Delete Section 1110.3 and replace as follows:]

M-1110.3 Test gases. The medium used for pressure testing the refrigerant system shall be one of the following inert gases: oxygen-free nitrogen, helium, argon or premixed nonflammable oxygen-free nitrogen with a tracer of gas of hydrogen or helium. For R-744 refrigerant systems, carbon dioxide shall be allowed as the test medium, For R-718 refrigerant systems, water shall be allowed as the test medium.

M-1110.3.1 Test gases not permitted. Oxygen, air, refrigerants other than those identified in Section 1110.3, combustible gases and mixtures containing such gases shall not be used as the pressure test medium.

* * *

[Delete Section 1110.5 and replace as follows:]

M-1110.5 Piping system strength test. Refrigerating system components and refrigerant piping shall be tested in accordance with ASME B31.5 or this section. Separate tests for isolated portions of the system are permitted and provided that all required portions are tested at least once. Pressurize with test gas for a minimum of 10 minutes to not less than the lower of (a) the lowest design pressure for any system component, or (b) the lowest value of set pressure for any pressure relief devices in the system. The design pressures for determination of test pressure shall be the pressure identified on the label nameplate of the condensing unit, compressor, compressor unit, pressure vessel, or other system component with a nameplate. A passing test result shall have no rupture or structural failure of any system component or refrigerant piping. Refrigerant popping and tubing greater than ¾ inches in diameter shall be tested in accordance with ASHRAE 15.

[Delete Section 1110.6 in its entirety, without substitution]

[Delete Section 1110.7 in its entirety, without substitution]

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CHAPTER 15

REFERENCED STANDARDS

* * *

[Add ASHRAE reference as follows:]

ASHRAE
ASHRAE
1791 Tullie Circle NE
Atlanta, GA 30329

15-2022	Safety Standard for Refrigeration Systems
34-2022	Designation and Safety Classification of Refrigerants

* * *

[Add ASTM reference as follows:]

ASTM
ASTM International
100 Bar Harbor Drive, P.O. Box C700
West Conshohocken, PA

A333-18	Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and other Applications with required Notch Toughness

* * *

[Add UL reference as follows:]

UL
UL, LLC
333 Pfingsten Road,
Northbrook, IL 60062-2096

UL/CSA 60335-2-40 2022	Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers
UL/CSA 60335-2-89 2021	Household and Similar Electrical Appliances—Safety—Part2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor.

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