IMC Significant Changes

Summary	Do not adopt change: 4	Adopt change: 135	Adopt change with amendment: 9 May include renumbering or integration of existing amendment

Last Updated: **6/06/24**

Red text = State amendment
Blue text = Model code change
= Significant change

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Chapter 1 Scope and Administration						
	Duties and Powers of the Code Official	104	104	The primary purpose of this code change is to update Section 104 to reflect the current manner that alternate methods and materials are evaluated, and to differentiate between evaluations from accredited evaluation agencies and evaluations from others, such as engineers	Adopt changes	Adopt all changes for Sections 104 and 105	
	Determination of compliance		104.2 and subsections	Reformatted and updated; specifies that the code official can adopt policies on approvals	Adopt changes		
	Applications and permits	104.2	104.3	Relocated	Adopt changes		
	Determination of substantially improved or damaged in flood hazard areas		104.3.1	Existing language from IBC,IEBC and IRC added to all codes; allows the use of digital documentation	Adopt changes		
	Warrant		104.4.1	Existing language added to all codes	Adopt changes		
	SECTION 104—DUTIES AND POWERS OF THE CODE OFFICIAL						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code.

104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures:

1. Shall be in compliance with the intent and purpose of this code.
2. Shall not have the effect of waiving requirements specifically provided for in this code.

104.2.1 Listed compliance. Where this code or a referenced standard requires *equipment*, materials, products or services to be *listed* and a listing standard is specified, the listing shall be based on the specified standard. Where a listing standard is not specified, the listing shall be based on an *approved* listing criteria. Listings shall be germane to the provision requiring the listing. Installation shall be in accordance with the listing and the manufacturer's instructions, and where required to verify compliance, the listing standard and manufacturer's instructions shall be made available to the code official.

104.2.2 Technical assistance. To determine compliance with this code, the code official is authorized to require the owner or owner's authorized agent to provide a technical opinion and report.

[A] 104.2.2.1 Costs. A technical opinion and report shall be provided without charge to the jurisdiction **104.2.2.2 Preparer qualifications.** The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a *registered design professional*.

[A] 104.2.2.3 Content. The technical opinion and report shall analyze the properties of the design, operation or use of the *building* or premises and the facilities and appurtenances situated thereon to identify and propose necessary recommendations.

104.2.2.4 Tests. Where there is insufficient evidence of compliance with the provisions of this code, the code official shall have the authority to require tests as evidence of compliance. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized test standards, the code official shall approve the testing procedures. Such tests shall be performed by a party acceptable to the code official.

104.2.3 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and *equipment* complying with the *International Code Council Performance Code*.

[A] 104.2.3.1 Approval authority. An alternative material, design or method of construction shall be *approved* where the code official finds that the proposed alternative is satisfactory and complies with Sections 104.2.3 through 104.2.3.7, as applicable.

[A] 104.2.3.2 Application and disposition. Where required, a request to use an alternative material, design or method of construction shall be submitted in writing to the code official for approval. Where the alternative material, design or method of construction is not *approved*, the code official shall respond in writing, stating the reasons the alternative was not *approved*.

[A] 104.2.3.3 Compliance with code intent. An alternative material, design or method of construction shall comply with the intent of the provisions of this code.

[A] 104.2.3.4 Equivalency criteria. An alternative material, design or method of construction shall, for the purpose intended, be not less than the equivalent of that prescribed in this code with respect to all of the following, as applicable:

1. Quality.
2. Strength.
3. Effectiveness.
4. Durability.
5. Safety, other than fire safety.
6. Fire safety.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments

shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

[A] 104.2.3.5.1 Fire tests. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

104.2.3.6 Reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall comply with Sections 104.2.3.6.1 and 104.2.3.6.2.

104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an *approved* agency, and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition of the *approved* agency. Criteria used for the evaluation shall be identified within the report and, where required, provided to the code official.

104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a *registered design professional*.

104.2.3.7 Peer review. The code official is authorized to require submittal of a peer review report in conjunction with a request to use an alternative material, design or method of construction, prepared by a peer reviewer that is *approved* by the code official.

104.2.4 Modifications. Where there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, provided that the code official shall first find that one or more special individual reasons make the strict letter of this code impractical, and that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety or structural requirements. The details of the written request for and action granting modifications shall be recorded and entered in the files of the department of building safety.

104.2.4.1 Flood hazard areas. The code official shall not grant modifications to any provision required in flood hazard areas, as established by Section 1612.3 of the *International Building Code*, unless a determination has been made that:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 of the *International Building Code* inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety or extraordinary public expense; cause fraud on or victimization of the public; or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the *building* is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

104.3 Applications and permits. The code official shall receive applications, review *construction documents,* issue permits, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

104.3.1 Determination of substantially improved or substantially damaged existing buildings and structures in flood hazard areas. For applications for reconstruction, rehabilitation, repair, *alteration*, addition or other improvement of existing *buildings* or structures located in flood hazard areas, the code official shall determine if the proposed work constitutes substantial improvement or repair of substantial damage. Where the code official determines that the proposed work constitutes substantial improvement or repair of substantial damage, and where required by this code, the code official shall require the *building* to meet the requirements of Section 1612 of the *International Building Code* or Section R322 of the *International Residential Code*, as applicable.

104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on any premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry. **104.4.1 Warrant.** Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent, occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after a proper request is made as herein provided, to permit entry therein by the code official for the purposes of inspection and examination pursuant to this code. **104.5 Identification.** The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code. **104.6 Notices and orders.** The code official shall issue all necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114. **104.7 Official records.** The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the *building* or structure to which such records relate remains in existence, unless otherwise provided by other regulations. **104.7.1 Approvals.** A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws. **104.7.2 Inspections.** The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each. **104.7.3 Code alternatives and modifications.** Application for alternative materials, design and methods of construction and *equipment* in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records. **104.7.4 Tests.** The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5. **104.7.5 Fees.** The code official shall keep a record of fees collected and refunded in accordance with Section 108. **104.8 Liability.** The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of an act or by reason of any act or omission in the discharge of official duties. **104.8.1 Legal defense.** Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by the legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code. **104.9 Approved materials and equipment.** Materials, *equipment* and devices *approved* by the code official shall be constructed and installed in accordance with such approval. **104.9.1 Material and equipment reuse.** Materials, *equipment* and devices shall not be reused unless such elements are in good working condition and *approved*.						
	Qualifications (Means of appeal)	114.3	112.3	Specifies that the training and experience must be on matters pertaining to the provisions of this code	Adopt changes	Adopt changes	
	112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to the provisions of this code and are not employees of the jurisdiction						
	Chapter 2 Definitions						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Def: Ambulatory Care Facility		202	New Definition	Adopt changes	Adopt changes	
	[BG] AMBULATORY CARE FACILITY. *Buildings* or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.						
	Def: Approved Agency			Swaps "agency" with "organization" and adds "furnishing evaluation or certification"	Adopt changes	Adopt changes	
	[A] APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been *approved* by the code official.						
	Def: Balanced Ventilation System	202	202	Added "System" to title. Added "The balanced ventilation system airflow is the average of the mechanical supply and mechanical exhaust airflows."	Adopt changes	Adopt changes	
	BALANCED VENTILATION SYSTEM. A ventilation system that simultaneously supplies outdoor air to and exhausts air from a space, where the mechanical supply airflow rate and the mechanical exhaust airflow rate are each within 10 percent of the average of the two airflow rates.						
	Def: Condensing Unit	202	202	Correlates the definition between the model codes	Adopt changes	Adopt changes	
	CONDENSING UNIT. ~~A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories~~ A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more power-driven compressors, condensers, liquid receivers (where required) and factory-supplied accessories.						
	Def. Draftstop		202	Correlates with IBC and IFC	Adopt changes	Adopt changes	
	DRAFTSTOP. A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of *building* components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.						
	Def: Grease Duct		202	New definition for commonly used term for a duct serving Type I hoods	Adopt changes	Adopt changes	
	GREASE DUCT. A duct serving a Type I hood, or cooking *appliances* equipped with integral down-draft exhaust systems that produce grease, to convey grease-laden air from the hood or cooking *appliance* directly to the outdoors.						
	Def: Gypsum Board, Gypsum Wallboard		202	New definitions for material	Adopt changes	Adopt changes	
	[BS] GYPSUM BOARD. A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing. **[BS] GYPSUM WALLBOARD.** A gypsum board used primarily as an interior surfacing for *building* structures.						
	Def: Heat Pump	202	202	Correlates the definition between the model codes	Adopt changes	Adopt changes	

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	HEAT PUMP. ~~A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose~~. A *refrigeration system* or factory-made *appliance* that utilizes refrigerant to transfer heat into a space or substance.						
	Def: Listed	202	202	Clarifies that other words may be used in lieu of "Listed"	Adopt changes	Adopt changes	
	[A] LISTED. *Equipment,* materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed equipment* or mate- rials or periodic evaluation of services and whose listing states either that the *equipment*, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. Terms that are used to identify *listed equipment*, products or materials include "listed," "certified," "classified" or other terms as determined appropriate by the listing organization.						
	Def: Lower Flammable Limit (LFL)	202	202	The previous definition implies that it is the concentration that is the substance capable of propagating the flame, instead of the flame being what is capable	Adopt changes	Adopt changes	
	LOWER FLAMMABLE LIMIT (REFRIGERANT) (LFL). The minimum concentration of refrigerant at which a flame is capable of propagating through a homogeneous mixture of refrigerant and air under specific test conditions in accordance with ASHRAE 34.						
	Def: Noncombustible Materials	202	202	Removes the specifics of what is involved in ASTM E136 testing	Adopt changes	Adopt changes	
	NONCOMBUSTIBLE MATERIAL~~S~~. ~~Materials that, when tested in accordance with ASTM E136, have not fewer than three of four specimens tested meeting all of the following criteria:~~ A material that passes ASTM E136. ~~1. The recorded temperature of the surface and interior thermocouples shall not at any time during the test rise more than 54°F (30°C) above the furnace temperature at the beginning of the test.~~ ~~2. There shall not be flaming from the specimen after the first 30 seconds.~~ ~~3. If the weight loss of the specimen during testing exceeds 50 percent, the recorded temperature of the surface and interior thermocouples shall not at any time during the test rise above the furnace air temperature at the beginning of the test, and there shall not be flaming of the specimen.~~						
	Def: Peer Review		202	Added to address a method of review utilized by many jurisdictions (see 104.2.3.7)	Adopt changes	Adopt changes	
	[A] PEER REVIEW. An independent and objective technical review conducted by an *approved* third party.						
	Def: Refrigerant	202	202	correlates the definition between the model codes and ASHRAE 15	Adopt changes	Adopt changes	
	REFRIGERANT. ~~A substance utilized to produce refrigeration by its expansion or vaporization.~~ The fluid used for heat transfer in a *refrigeration system* that undergoes a change of state to absorb heat. **REFRIGERANT DESIGNATION.** The unique identifying alphanumeric value or refrigerant number assigned to an individual refrigerant and published in ASHRAE						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	34.						
	Def: Refrigerant Safety Group Classification	202	202	Editorial	Adopt changes	Adopt changes	
	REFRIGERANT SAFETY GROUP CLASSIFICATION. The alphanumeric designation that indicates both the toxicity and flammability classifications of refrigerants in accordance with ASHRAE 34. **Flammability classification (refrigerant).** The alphanumeric designation used to identify the flammability of refrigerants. Class 1. Indicates a refrigerant with no flame propagation. Class 2. Indicates a refrigerant with low flammability. Class 2L. Indicates a refrigerant with low flammability and low burning velocity. Class 3. Indicates a refrigerant with high flammability. **Toxicity classification (refrigerant).** An alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with low toxicity. Class B indicates a refrigerant with high toxicity.						
	Def: Flammability Classification (Refrigerant)	202	202	Moved to be a sub def. under "Refrigeration System"	Adopt changes	Adopt changes	
	Def: Refrigeration System	202	202	Changes "Refrigerating" to "Refrigeration;" editorial changes to correlate with ASHRAE 15	Adopt changes	Adopt changes	
	REFRIGERATION SYSTEM. A combination of interconnected ~~refrigerant-containing parts constituting one closed refrigerant circuit~~ parts in which a refrigerant is enclosed and is circulated for the purpose of extracting then rejecting heat.						
	Def: Refrigeration System, Mechanical	202	--	Deleted existing definition; inaccurate definition with reference to only one circuit	Adopt changes	Adopt changes	
	~~**REFRIGERATION SYSTEM, MECHANICAL.** A combination of interconnected refrigeration-containing parts constituting one closed refrigerant circuit in which a refrigerant is circulated for the purpose of extracting heat and in which a compressor is used for compressing the refrigerant vapor.~~						
	Def: Steam Bath Equipment		202	New definition	Adopt changes	Adopt changes	
	STEAM BATH EQUIPMENT. Includes steam bath generators, combination room and steam generator systems, and steam bath cabinets intended for high-humidity concentrated heating at elevated temperatures for personal bathing.						
	Def: Toxicity Classification (Refrigerant)	202	202	Moved to be a sub def. under "Refrigeration System"	Adopt changes	Adopt changes	
	Chapter 3 General Regulations						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Cutting and notching in cold-formed steel framing	302.5 thru 302.5.2	302.5, 302.5.1	Simplified language by referencing appropriate standards.	Adopt changes	Adopt changes	
	~~**302.5 Cutting, notching and boring in steel framing.** The cutting, notching and boring of steel framing members shall comply with Sections 302.5.1 through 302.5.3.~~ **[BS] 302.5 Cutting and notching in cold-formed steel framing.** The cutting and notching of holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for nonstructural members. **[BS] 302.5.1 Cutting, notching and boring holes in structural steel framing.** The cutting, notching and boring of holes in structural steel framing members shall be as prescribed by the *registered design professional*. ~~**[BS] 302.5.2 Cutting, notching and boring holes in cold-formed steel framing.** Flanges and lips of loadbearing cold-formed steel framing members shall not be cut or notched. Holes in webs of load-bearing cold-formed steel framing members shall be permitted along the centerline of the web of the framing member and shall not exceed the dimensional limitations, penetration spacing or minimum hole edge distance as prescribed by the *registered design professional*. Cutting, notching and boring holes of steel floor/roof decking shall be as prescribed by the *registered design professional*.~~ ~~**[BS] 302.5.3 Cutting, notching and boring holes in non-structural cold-formed steel wall framing.** Flanges and lips of nonstructural cold-formed steel wall studs shall not be cut or notched. Holes in webs of nonstructural cold-formed steel wall studs shall be permitted along the centerline of the web of the framing member, shall not exceed 11/2 inches (38 mm) in width or 4 inches (102 mm) in length, and shall not be spaced less than 24 inches (610 mm) center to center from another hole or less than 10 inches (254 mm) from the bearing end.~~						
	Piping Support Spacing	Table 305.4	Table 305.4	Removes obsolete PB piping requirements	Adopt changes	Adopt changes	
	Protection against physical damage	305.5	305.5/305.5.1	Thickness of shield plates is moved to its own subsection	Adopt changes	Adopt changes	
	305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than ~~1 ½~~ $1^1/_4$ inches (32 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~having a minimum thickness of 0.0575 inch~~ shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates. **305.5.1 Shield plates.** Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.4605 mm) (No. 16 gage).						
	Access	306.1	306.1	Changes "shall be accessible for inspection…" to "shall provide access for inspection…"	Adopt changes	Adopt changes	
	306.1 Access. *Appliances*, controls devices, heat exchangers and HVAC system components that utilize energy shall provide access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other *appliances*, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.						
Yes	Equipment and appliances on roofs or elevated structures	306.5	306.5	Correlates with updated OSHA standard	Adopt changes, delete state amendment	Adopt changes without state amendment	Could have slight initial cost increase but ultimately cost savings

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	306.5 Equipment or appliances on roofs or elevated structures. Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a *building* such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall. Permanent ladders installed to provide the required access shall comply with the following minimum design criteria: 1. The side railing shall extend above the parapet or roof edge or landing platform not less than ~~30~~ 42 inches (1067 mm). 2. Ladders shall have rung spacing ~~not to exceed 12 inches (305 mm)~~ not less than 10 inches (254 mm) and not to exceed 14 inches (356 mm) on center. The upper~~-~~most rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable. 3. Ladders shall have a toe spacing not less than ~~6~~ 7 inches (178 mm) and not more than 12 inches (305 mm) deep. 4. There shall be not less than ~~18~~ 16 inches (406 mm) between rails. 5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load. 6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing. 7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed. 8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder. 9. Ladders shall be protected against corrosion by *approved* means. 10. Access to ladders shall be provided at all times. 11. Top landing required. The ladder shall be provided with a clear and unobstructed landing on the exit side of the roof hatch, having a minimum space of 30 inches (762 mm) deep and being the same width as the hatch. Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms. **Exception:** This section shall not apply to Group R-3 *occupancies*.						
	Chapter 4 Ventilation						
Yes	Intake opening location	401.4	401.4	Removes "approved" from "approved factory-built intake exhaust" fitting in Item 3; adds "fan" at the end of Item 3. No special approval should be required for these termination fittings when installed per mfr instructions.	Keep state amendment but integrate these changes into Item 3.	Agree with staff recommendations	Look at code change to change “fan manufacturer’s instructions” to “equipment manufacturer’s instructions”
	401.4 Intake opening location. Air intake openings shall comply with all of the following: 1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot. Lot lines shall not be defined as a separation from a street or public way. 2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking garage entries, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way. **Exceptions:** 2.1. Intake air openings providing less than 500 cfm of outdoor air to Group R occupancies are permitted to be located less than 10 feet (3048 mm) horizontally from parking lots provided that the openings are not less than 15 feet (4572 mm) vertically above the parking lot. 2.2. Intake air openings providing less than 500 cfm of outdoor air to Group R occupancies are permitted to be located less than 10 feet (3048 mm) horizontally from parking lots provided that the openings are not less than 15 feet (4572 mm) vertically above the clear height for vehicles in the parking garage. ~~2.~~3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening. Separation is not required between intake air openings, operable openings, and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where a factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the fan manufacturer's instructions. For these combined terminations, the exhaust air concentration within the intake airflow shall not exceed 10 percent as established by the manufacturer, in accordance with ASHRAE 62.2 Section 6.8, Exception 4. A minimum of three feet (914 mm) separation shall be maintained between other environmental air exhaust outlets and other dwelling or sleeping unit factory-built intake/exhaust combination termination fittings. 4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the *Inter- national Building Code* for utilities and attendant equipment. **Exception:** Enclosed parking garage and repair garage ventilation air intakes are permitted to be located less than 10 feet horizontally from or 25 feet vertically above a street, alley, parking lot or loading dock.						
	Other buildings intended to be occupied (Outdoor air rates)	403.3	403.3	Removes reference to "three stories and less above grade plane" with the rationale that this takes buildings below the ventilation requirements in ASHRAE	Adopt change	Adopt change as shown	
	403.3 Outdoor air and local exhaust airflow rates. Group R ~~-2, R-3 and R-4~~ *occupancies* ~~three stories and less in height above grade plane~~ shall be provided with outdoor air and local exhaust in accordance with Section ~~403.3.2~~403.4. ~~Other~~ All other *buildings* intended to be occupied shall be provided with outdoor air and local exhaust in accordance with Section 403.3.1.						
Yes	Minimum Ventilation Rates	Table 403.3.1.1	Table 403.3.1.1	**New categories added**: Animal facilities (11); Outpatient healthcare facilities (18); in Food and Beverage: Break rooms, coffee stations, corridors, occupiable storage rooms; in Hotels etc.: central laundry, laundry within dwelling units; in Offices: break rooms, occupiable storage rooms; in Public Spaces: room with adult	Retain the existing state amendments to the table, but adopt all other model code updates	Retain the existing state amendments to the table, but adopt all other model code updates	

<table>
<tr><th>Existing State Amendment</th><th>Title or Subject</th><th>2021 IMC #</th><th>2024 IMC #</th><th>Summary</th><th>2024 Staff Recommendation</th><th>2024 TAG Member Recommendation</th><th>Other Comments</th></tr>
<tr><td></td><td></td><td></td><td></td><td>changing station; in Specialty shops: banks or lobbies; in Storage: added less than 50°F to refrigerated warehouses; in Workrooms: manufacturing with hazardous materials, manufacturing without hazardous materials, sorting/packing/light assembly, telephone closets. New footnotes i and j for healthcare facilities, k for dental and l for warehouses.</td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="7">See existing state amendments report for the full table text</td></tr>
<tr><td>Yes</td><td>Group R ventilation rates</td><td>403.3.2</td><td>403.3.2</td><td>Similarly to the change in 403.3.1, reference to "three stories or less above grade plane" is removed. This section is not adopted as the state has a specific ventilation code section for residential</td><td>Do not adopt; keep state amendment</td><td>Retain state amendment</td><td></td></tr>
<tr><td></td><td colspan="7">403.3.2 Group R-2, R-3 and R-4 occupancies ~~three stories and less.~~ ~~The design of local exhaust systems and ventilation systems for outdoor air in Group R-2, R-3 and R-4 occupancies shall comply with Sections 403.3.2.1 through 403.3.2.5~~This section is not adopted. See Section 403.4.</td></tr>
<tr><td>Yes</td><td>Minimum Required Local Exhaust Rates</td><td>Table 403.3.2.3</td><td>Table 403.3.2.3</td><td>Similarly to the change above, reference to "three stories or less above grade plane" is removed. This section is not adopted as the state has a specific ventilation code section for residential</td><td>Do not adopt; keep state amendment</td><td>Retain state amendment</td><td></td></tr>
<tr><td></td><td colspan="7">
<table>
<tr><th colspan="2">~~TABLE 403.3.2.3—~~
~~MINIMUM REQUIRED LOCAL EXHAUST RATES FOR GROUP R-2, R-3 AND R-4 OCCUPANCIES~~ ~~THREE STORIES AND LESS~~</th></tr>
<tr><th>~~AREA TO BE EXHAUSTED~~</th><th>~~EXHAUST RATE CAPACITY~~</th></tr>
<tr><td>~~Kitchens~~</td><td>~~100 cfm intermittent or 50 cfm continuous~~</td></tr>
<tr><td>~~Bathrooms and toilet rooms~~</td><td>~~50 cfm intermittent or 25 cfm continuous~~</td></tr>
<tr><td colspan="2">~~For SI: 1 cubic foot per minute = 0.0004719 m³/s.~~</td></tr>
</table>
</td></tr>
<tr><td>Yes</td><td>General (Ambulatory Care Facilities)</td><td>407.1</td><td>407.1</td><td>Editorial; adds ASHE to the ASHRAE standard citation</td><td>Keep state amendment but</td><td>Keep state amendment but</td><td></td></tr>
</table>

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
					add the new reference	add the new reference	
	407.1 General. Mechanical ventilation for health care facilities licensed by Washington state shall be designed and installed in accordance with this code and the following provisions of the Washington Administrative Code (WAC): **1.** Mechanical ventilation in ambulatory care facilities shall comply with chapter 246-330 WAC. **2.** Mechanical ventilation for acute care hospitals shall comply with chapter 246-320 WAC. **3.** Mechanical ventilation for nursing homes shall comply with chapter 388-97 WAC. Mechanical ventilation for unlicensed ambulatory care facilities ~~and Group I-2 *occupancies*~~ shall be designed and installed in accordance with this code, ASHRAE/ASHE 170 and NFPA 99.						
		Chapter 5 Exhaust Systems					
Yes	Location of exhaust outlets	501.3.1	501.3.1	Edits are all in Item 3. Adds an allowance for exhaust opening to be 1 ft or more above a gravity intake opening for ease of installation in tight wall areas. Removes "approved" from "approved factory-built intake exhaust" fitting; adds "fan" at the end .	Keep state amendment but integrate new language	Keep state amendment but integrate new language	Look at code change pertaining to "fan mfr instructions" Potential decrease in cost
	501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances: 1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings that are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade. 2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade. 3. For ~~all~~ *environmental air* exhaust other than enclosed parking garage and transformer vault exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings, except where the exhaust opening is located not less than 1 foot (305 mm) above the gravity air intake opening into buildings for all *occupancies* other than Group U; and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where a factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the fan manufacturer's instructions. **Exceptions:** 1. The separation between an air intake and exhaust outlet on a single listed package HVAC unit. 2. Exhaust from environmental air systems other than garages may be discharged into an open parking garage. 3. Except for Group I occupancies, where ventilation system design circumstances require building HVAC air to be relieved, such as during economizer operation, such air may be relieved into an open or enclosed parking garage within the same building. ~~3.~~4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment. 5. For enclosed parking garage exhaust system outlets and transformer vault exhaust system outlets: 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 3 feet (914 mm) horizontally from, 10 feet (3048 mm) above or 10 feet (3048 mm) below adjoining finished sidewalk.						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	6. For transformer vault exhaust system outlets, subject to the requirements of NFPA 70 Section 450.45: Ten feet (3048 mm) from fire escapes, required means of egress at the exterior of the building, elements of exit discharge, exterior combustible materials, and openings that are not protected in accordance with Section 705.8 of the International Building Code; 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above walkways. 7. For elevator machinery rooms in enclosed or open parking garages: Exhaust outlets may discharge air directly into the parking garage. ~~4.~~8. For specific systems, see the following sections: ~~4.1.~~8.1. Clothes dryer exhaust, Section 504.4. ~~4.2.~~8.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.13, 506.4 and 506.5. ~~4.3.~~8.3. Dust, stock and refuse conveying systems, Section 510.2. ~~4.4.~~8.4. Subslab soil exhaust systems, Section 511.4. ~~4.5.~~8.5. Smoke control systems, Section 512.10.3. ~~4.6.~~8.6. Refrigerant discharge, Section 1105.7. ~~4.7.~~8.7. *Machinery room* discharge, Section 1105.6.1.						
	Common ducts		501.6	Only allows common duct connection under negative pressure	Adopt changes	Adopt changes	
	501.6 Common ducts. The discharge from exhaust fans serving separate *dwelling* or *sleeping units* shall not be connected to a common duct or shaft, except where the common duct or shaft is maintained at a negative pressure.						
	Protection against physical damage	504.8	504.8/ 504.8.1	Thickness of shield plates is moved to its own subsection	Adopt changes	Adopt changes	
	504.8 Protection against physical damage. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates ~~having a thickness of not less than 0.0575 inch~~ shall be placed on the finished face of all framing members where there is less than $1^1/_4$ inches (32 mm) between the duct and the finished face of the framing member. Protective shield plates shall extend not less than 2 inches (51 mm) above sole plates and below top plates. **504.8.1 Shield plates.** Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).						
	Commercial clothes dryers	504.10	504.10	Added a reference to UL 2158A for the specific listing for dryer installation similar to that required for domestic dryers	Adopt changes	Adopt changes	
	504.10 Commercial clothes dryers. The installation of dryer exhaust ducts serving commercial clothes dryers shall comply with the *appliance* manufacturer's installation instructions. Exhaust fan motors installed in exhaust systems shall be located outside of the airstream. In multiple installations, the fan shall operate continuously or be interlocked to operate when any individual unit is operating. Ducts shall have a minimum *clearance* of 6 inches (152 mm) to combustible materials. Clothes dryer transition ducts used to connect the *appliance* to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm) in length and shall be *listed* and *labeled* in accordance with UL 2158A. Transition ducts shall not be concealed within construction.						
Yes	Exhaust ducts (Domestic Cooking)	505.3	505.3	A reference to two new sections (505.7/505.8) specific to Group I-1 and I-2 occupancies is inserted	Retain state amendment but integrate	Retain state amendment but integrate ref to 505.7 / 505.8	

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
					changes from 2024 (and 2018)		
	505.3 Domestic exhaust ducts. Ducts serving domestic cooking exhaust *equipment* shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be airtight, ~~and~~ shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems. Installations in Group I-1 and I-2 *occupancies* shall be in accordance with the *International Building Code* and Section 904.14 of the *International Fire Code* and Section 505.7 or 505.8. Domestic kitchen exhaust ducts may terminate with other domestic dryer exhaust and residential local exhaust ducts at a common location where each duct has an independent back-draft damper. Listed and labeled exhaust booster fans shall be permitted when installed in accordance with the manufacturer's installation instructions. **Exceptions:** 1. Where installed in accordance with the manufacturer's instructions and where ~~mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4~~continuous local exhaust is provided in an enclosed kitchen in accordance with Table 403.4.7, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors. The local exhaust from the residential dwelling unit or sleeping unit kitchen area may be combined with other exhaust ductwork where the exhaust register/grille in the kitchen is a minimum of 6 feet (1.8 M) from the domestic range cooktop. The exhaust register/grille shall be provided with a minimum MERV 3 filter or mesh filter (washable) for trapping grease. 2. Ducts for domestic kitchen cooking *appliances* equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following: 2.1. The duct shall be installed under a concrete slab poured on grade. 2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel. 2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface. 2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the *building*. 2.5. The PVC ducts shall be solvent cemented.						
	Group I-I occupancies		505.7	New section describing requirements for the use of domestic equipment in Group I-1/I-2 occupancies	Adopt new section	Adopt new section	
	505.7 Group I-1 occupancies. In Group I-1 *occupancies*, hood installations over domestic cooking equipment installed in accordance with Section 420.9 of the *International Building Code* shall comply with the following: 1. Range hoods shall have a minimum air flow rate of 500 cfm (14 000 L/min). 2. Mechanical ventilation shall be provided to the rooms or spaces containing the domestic cooking equipment in accordance with Section 403.3.1. 3. Range hood exhaust shall discharge to the outdoors. **Exception:** A *listed* and *labeled* ductless range hood shall be permitted where a charcoal filter is provided in the hood to reduce smoke and odors.						
	Group I-2 occupancies		505.8	New section describing requirements for the use of domestic equipment in Group I-1/I-2 occupancies	Adopt new section	Adopt new section	
	505.8 Group I-2 occupancies. In Group I-2 *occupancies*, hood installations above domestic cooking equipment installed in accordance with Section 407.2.7 of the *International Building Code* shall comply with the following: 1. Range hoods shall have a minimum air flow rate of 500 cfm (14 000 L/min).						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	2. Mechanical ventilation shall be provided to the rooms or spaces containing the domestic cooking equipment in accordance with Section 403.3.1. 3. Range hood exhaust shall discharge to the outdoors. **Exception:** A *listed* and *labeled* ductless range hood shall be permitted where a charcoal filter is provided in the hood to reduce smoke and odors.						
	Corrosion protection	506.2	506.2	Adds "and exhaust equipment" to ensure all exposed portions of the hood system are protected.	Adopt changes		
	506.1 Corrosion protection. Ducts and exhaust equipment exposed to the outside atmosphere or subject to a corrosive environment shall be protected against corrosion in an *approved* manner.						
	Grease duct systems	506.3	506.3	Replaces "Ducts serving Type 1 hoods" with "Grease duct systems." Part of the change that changed most "duct" and "Type 1 hoods" references to "grease duct" throughout the subsections of 506.3	Adopt changes		
	506.3 ~~Ducts serving Type I hoods.~~ ~~Type I exhaust ducts shall be independent of all other exhaust systems except as provided in Section 506.3.5. Commercial kitchen duct systems serving Type I hoods shall be designed, constructed and installed in accordance with Sections 506.3.1 through 506.3.13.3.~~ **506.3 Grease duct systems.** Grease duct systems shall be designed, constructed and installed in accordance with Sections 506.3.1 through 506.3.13.3.						
	Grease duct test	506.3.2.5	506.3.2.5 506.3.2.5.1 506.3.2.5.2	A testing requirement has been added, with the specifics for the testing (light/water) added as two new sections.	Adopt changes		
	506.3.2.5 Grease duct test. A field test shall be performed prior to the use or concealment of any portion of a grease duct system. Grease ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the grease ducts from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid tight. A test shall be performed for the entire grease duct system, including the hood-to-duct connection. The grease duct system shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds. The test shall be performed in accordance with either Section 506.3.2.5.1 or 506.3.2.5.2. **506.3.2.5.1 Light test.** A duct test shall be performed by passing a lamp, having not less than 1600 lumens, through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A successful test shall be where the light from the lamp is not visible at any point on the exterior of the duct. **506.3.2.5.2 Water spray test.** A duct test shall be performed by simulating a cleaning operation of the interior of the duct. A water pump capable of a flowing outlet pressure of not less than 1,200 psi (8274 kPa) shall be used, along with any necessary hoses and spray nozzles, to apply high-pressure water to the inside surfaces of the duct. A successful test shall be where there is no evidence of cleaning water at any point on the exterior of the duct.						
	Exhaust fans	506.5.1	506.5.1	UL standard was updated	Adopt changes		
	506.5.1 Exhaust fans. Exhaust fan housings serving a Type I hood shall be constructed as required for grease ducts in accordance with Section 506.3.1.						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Exception: Fans *listed* and *labeled* in accordance with UL ~~762~~ 705.						
	Pollution control units	506.5.2	506.5.2	Portions of Item 4 were moved into Item 5 and Item 5 was divided int subsections for better clarity; UL standard was updated	Adopt changes		
	506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following: 1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782. 2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with UL ~~762~~ 705. 3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*. 4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. ~~Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be listed and labeled, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.~~ 5. *Clearances* shall be maintained between the pollution-control unit and combustible material in accordance with the listing. Where enclosed grease duct systems, as required by Section 506.3.11, are connected to a pollution control unit installed indoors, all of the following shall apply: 5.1. The unit shall be *listed* and *labeled*, in accordance with ASTM E2336 or UL 2221, for location in an enclosure. 5.2. The unit shall be installed in a dedicated room or space enclosure, constructed as required by Section 506.3.11, and have the same fire-resistance rating as the duct enclosure. 5.3. Access shall be provided for servicing and cleaning of the unit. 5.4. The dedicated room or space enclosure shall be ventilated in accordance with the manufacturer's installation instructions. 6. Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listing. 7. Roof-mounted pollution-control units shall be *listed* for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof. 8. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13. 9. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur. 10. Pollution-control units shall be provided with a factory-installed fire suppression system. 11. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306. 12. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other *approved* means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings. 13. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.						
	Commercial kitchen hoods	507	507	Section 507 was reorganized and broken into three main sections: General (507.1), Type I Hoods (507.2), Type II Hoods (507.3). Light duty appliances	Adopt changes		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
				was moved to the Type II hood section.			
	General (Commercial Kitchen Hoods)	507.1	507.1	The last sentence of the main section was moved to 507.3 to clarify that if a Type I hood is installed in place of a Type II hood, all supporting systems must comply with that for a Type I hood. The existing exceptions were reorganized and four new exceptions added for wood burning ovens, the exception from the previous 507.2 was moved for "reduced grease emission appliances," electric dishwashers with a self-contained condensing system, and the bulk of the former section 507.3 for appliances that do not produce grease or smoke.	Adopt changes		

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I hood shall be installed at or above appliances in accordance with Section 507.2. A Type II hood shall be installed at or above *appliances* in accordance with Section 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

Exceptions:

1. Factory-built commercial cooking recirculating systems that are and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.1.6, 507.2.3, 507.2.5, 507.2.8, 507.2.10 and 507.3.1. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
2. A hood shall not be required at or above any of the following:
   - 2.1. Factory-built commercial cooking recirculating systems *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).
   - 2.2. Cooking *appliances* equipped with integral down-draft exhaust systems are *listed* and *labeled* for the application in accordance with NFPA 96.
   - 2.3. Smoker ovens with the integral exhaust systems are *listed* and tested for the application.
3. Ovens *listed* and *labeled* for use with wood fuel in accordance with UL 2162 and vented in accordance with the manufacturer's instructions.
4. An electric cooking *appliance listed* and *labeled* in accordance with UL 197 for reduced grease emissions.
5. Commercial electric dishwashers incorporating a self-contained condensing system *listed* and *labeled* in accordance with UL 921.
6. Where the heat and moisture loads from dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system design or into the design of a separate removal system. Spaces containing such cooking *appliances*

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \times m^2)$]. For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \times m^2)$].						
	Fuel-burning appliances	507.1.3	507.1.3	More specific requirements are added for the use of draft hoods or atmospheric burners in the same space containing Type I or Type II hoods.	Adopt changes		
	507.1.3 Fuel-burning appliances. ~~Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the appliance vents.~~ *Appliances* equipped with draft hoods or atmospheric burners shall not be located in the same room or space containing a Type I or Type II hood except where the *appliance* is located in a sealed enclosure equipped with a self-closing device with combustion air obtained from the outdoors or from other spaces in the *building* in accordance with Chapter 7 or the *International Fuel Gas Code*.						
	Hood size and location	507.4	507.1.6	Relocated	Adopt changes		
	Performance test	507.6	507.1.7	Relocated	Adopt changes		
Yes	Type I hoods	507.2	507.2	Existing exception moved to 507.1	Accept the move for the exception but retain the state amendment exception at this location		
	507.2 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances*. **Exceptions:** 1. ~~A Type I hood shall not be required for an electric cooking *appliance* where an approved testing agency provides documentation that the *appliance* effluent contains 5 mg/m3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m3/s) in accordance with UL 710B.~~ 2. A Type I hood shall not be required in a Group R-2 type occupancy with not more than 16 residents.						
	Extra-heavy-duty cooking appliances	507.5.1	507.2.2.10.1	Relocated	Adopt changes		
	Heavy-duty cooking appliances	507.5.2	507.2.2.10.2	Relocated	Adopt changes		
	Medium-duty cooking appliances	507.5.3	507.2.2.10.3	Relocated	Adopt changes		
	Capacity of Type I hoods	507.5	507.2.10	Relocated	Adopt changes		
	Fire suppression systems	509.1	507.2.11	Relocated requirement as part of the reorganization of 507 as it only pertains to Type I hoods.	Adopt changes		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	507.2.11 Fire suppression systems. A Type I hood shall be provided with an *approved* automatic fire suppression system complying with Section 904.12 of the *International Building Code* and the *International Fire Code*.						
	Type II hoods	507.3	507.3	A portion of the existing language was moved to 507.1 as exception 6 while a sentence from 507.1 was moved and clarified as to the use of Type I hoods in lieu of a Type II hood	Adopt changes		
	507.3 Type II hoods. Type II hoods shall be installed above *light-duty cooking appliances*, dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking ~~process except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system~~. Type II hoods shall be installed above all *appliances* that produce products of *combustion* and do not produce grease or smoke as a result of the cooking process. ~~Spaces containing cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 m3/(s • m2). For the purpose of determining the floor area required to be exhausted, each individual appliance that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 m3/(s • m2)].~~ A Type I hood shall be permitted to be installed for a required Type II hood, provided that the Type I hood installation complies with all of the requirements for a Type I hood installation. Where such a Type I hood serves only dishwashers and *appliances* that require a Type II hood, the Type I hood shall not be required to have fire suppression or grease filters.						
	Capacity of Type II hoods		507.3.4	Added a section specific to the exhaust capacity needed for Type II hoods similar to Section 507.2.10 for Type I	Adopt changes		
	507.3.4 Capacity of Type II hoods. Type II hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.3.4.1 through 507.3.4.2. The net quantity of *exhaust air* shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood.						
	Light-duty cooking appliances	507.5.4	507.3.4.1	Relocated	Adopt changes		
	Dishwashing appliances	507.5.5	507.3.4.2	Relocated	Adopt changes		
	Makeup air temperature	508.1.1	508.1.1	Intended to clarify the requirement, which was to either design the HVAC system for the kitchen to handle makeup air loads, or to have a dedicated makeup air conditioning system. Clarified that the 10 degree differential applies to the thermostat setpoint temperature in the kitchen, not the temperature of the kitchen.	Adopt change		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	508.1.1 Makeup air temperature. ~~The temperature differential between *makeup air* and the air in the conditioned space shall not exceed 10°F (6°C) except where the added heating and cooling loads of the *makeup air* do not exceed the capacity of the HVAC system.~~ HVAC systems that serve the kitchen space shall have the additional capacity necessary for the latent and sensible loads that are introduced by the *makeup air* supplied to the kitchen space, or the *makeup air* shall be conditioned by dedicated systems such that the difference in temperature between the *makeup air* supplied to the kitchen space and the design setpoint temperature in the kitchen space is not greater than 10°F (6°C). **Exception:** *Makeup air* supplied to a compensating hood shall not be required to be conditioned.						
	Makeup air duct	506.3.1.2	508.1.2	Relocated	Adopt change		
	Air balance	508.1.2	508.1.3	Renumbered only	Adopt change		
		Sections 510, 511, 512, 513, and 514 were renumbered			Adopt changes		
Chapter 6 Duct Systems							
	Return air openings	601.5	601.5	Specifies that the return in air 2, 7, 10 and both exceptions only refers to that for heating or AC systems. Two additional items added specific to return air from closets (8, 9) in an attempt to control moisture levels.	Adopt changes		
	601.5 Return air openings. Return air openings for heating, ventilation and air-conditioning systems shall comply with all of the following: 1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space. 2. Return air for heating or air-conditioning systems shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code. 3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space. 4. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, ACCA Manual D or the design of the *registered design professional*. 5. Return air taken from one *dwelling unit* shall not be discharged into another *dwelling unit*. 6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited. 7. Return air for heating or air-conditioning systems shall not be taken from a bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic. 8. Return air from a closet shall serve only the closet and shall not require a dedicated closet supply duct. 9. Return air taken from a closet smaller than 30 square feet (2.8 m^2) shall require the closet door be undercut not less than $1^1/_2$ inches (38 mm) or have either a louvered door or an air transfer grille, each with a net free area of not less than 30 square inches (19 355 mm^2). 10. Return air for heating or air-conditioning systems shall not be taken from indoor swimming pool enclosures and associated deck areas. **Exceptions:** 1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2. 2. Dedicated HVAC systems serving only such spaces.						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Exceptions: 1. Taking return air for heating or air-conditioning systems from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking *appliances*. 2. Taking return air for heating or air-conditioning systems from a kitchen is not prohibited in a *dwelling unit* where the kitchen and living spaces are in a single room and the cooking *appliance* is electric and located not less than 5 feet (1524 mm) in any direction from the return air intake opening. 3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.						
Yes	General (Plenums)	602.1	602.1/602.1.1/ 602.1.2	Single section was split into scoping section with three subsections; no substantive wording changes.	Adopt changes but modify to remove the second sentence of 602.1 and keep the state amendment within new 602.1.2		The redundant language in 602.1 was submitted as an errata item to ICC
	~~**602.1 General.** Supply, return, exhaust, relief and ventilation air *plenums* shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces, mechanical *equipment* rooms and the framing cavities addressed in Section 602.3. *Plenums* shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling *equipment*. Fuel-fired *appliances* shall not be installed within a *plenum*.~~ **602.1 General.** Supply, return, exhaust, relief and *ventilation air plenums* shall be in accordance with this section. ~~Fuel-fired *appliances* shall not be installed within a *plenum*.~~ **602.1.1 Locations limited.** *Plenums* shall be limited to uninhabited crawl spaces, above a ceiling or below the floor, attic spaces, mechanical equipment rooms and the framing cavities addressed in Section 602.2. **602.1.2 Limited to a fire area.** *Plenums* shall be limited to one fire area. Air systems that serve multiple fire areas shall be ducted ~~directly~~ from the boundary of the fire area served directly to the air-handling equipment. **602.1.3 Fuel-fired appliances.** Fuel-fired *appliances* shall not be installed within a *plenum*.						
	Stud cavity and joist space plenums	602.3	602.2.1	Renumbered; moved as a subsection of Construction of plenums	Adopt changes		
	Materials within plenums	602.2.1	602.3	Renumbered and reorganized Sections 602.2 and 602.3 for clarity. 602.2 is all construction requirements. 602.3 is requirements for materials within plenums	Adopt changes		
	602.3 Materials within plenums. ~~Except as required by Sections 602.2.1.1 through 602.2.1.8~~**,** Materials within *plenums* shall be noncombustible or shall be ~~listed and labeled as having a flame spread index of not more than 25 and a smoke developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723~~ in compliance with the applicable requirements in Sections 602.3.1 through 602.3.10. **Exceptions:** ~~1. Rigid and flexible ducts and connectors shall conform to Section 603.~~ ~~2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	~~3. This section shall not apply to materials exposed within *plenums* in one- and two family dwellings.~~ ~~4. This section shall not apply to smoke detectors.~~ ~~5. Combustible materials fully enclosed within one of the following:~~ ~~5.1. Continuous noncombustible raceways or enclosures.~~ ~~5.2. Approved gypsum board assemblies.~~ ~~5.3. Materials *listed* and *labeled* for installation within a *plenum* and listed for the application.~~ 1. Materials exposed within *plenums* in one- and two-family *dwellings*. 2. Combustible materials fully enclosed within one of the following: 2.1. Continuous noncombustible raceways or enclosures. 2.2. *Approved* gypsum board assemblies. 2.3. Materials *listed* and *labeled* for installation within a *plenum* and *listed* for the application. 3. ~~5.3~~ Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area. **602.3.1 Ducts, connectors, duct coverings, linings and tape.** Rigid and flexible ducts and connectors shall conform to Section 603. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604. **602.3.2 Smoke detectors.** Smoke detectors shall be *listed* and *labeled*.						
	Electrical equipment in plenums	602.2.1.4 - 602.2.4.1.2	602.3.6	Added to "electrical" to the section for requirements for plumbing and mechanical products in plenums	Adopt changes		
	602.3.6 Discrete electrical, plumbing and mechanical products in plenums. Where discrete electrical, plumbing and mechanical products and appurtenances are located in a *plenum* and have exposed combustible material, they shall be *listed* and *labeled* for such use in accordance with UL 2043. **Exception:** Electrical equipment with metallic enclosures exposed within a *plenum*.						
		602.2.1.1 thru 602.2.1.8	602.3.3 thru 602.3.8	Renumbered as subsections under materials within plenums	Adopt changes		
	Other combustible materials	part of 602.2.1	602.3.10	Portions of the language removed from 602.3 were relocated here	Adopt changes		
	602.3.10 Other combustible materials. Other combustible materials not covered by Section 602.3 shall be *listed* and *labeled* as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.						
	Coverings and linings	604.3	604.3	Adds a second exception allowing an increased smoke developed index for coverings located outside of ducts consistent with IBC requirements	Adopt changes		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	604.3 Coverings and linings. Duct coverings and linings, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than 50, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings and linings shall be *listed* and *labeled*. Exceptions: 1. Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawl spaces shall be subject to all of the following requirements: 1.1. The foam plastic insulation shall have a flame spread index not greater than 25 and a smoke-developed index not greater than 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. 1.2. The foam plastic insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). 1.3. The foam plastic insulation complies with the requirements of Section 2603 of the *International Building Code*. 1.4. The foam plastic insulation is protected against ignition in accordance with the requirements of Section 2603.4.1.6 of the *International Building Code*. 2. Duct coverings added to the outside of ducts and not contained in *plenums*, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings shall be *listed* and *labeled*.						
	Mechanical, electrical and plumbing controls		607.2.4	New section to specifically prohibit installation of wiring and controls through dampers unless part of the air distribution system	Adopt changes		
	607.2.4 Mechanical, electrical and plumbing controls. Mechanical, electrical and plumbing controls shall not be installed in air duct systems. **Exception:** Controls shall be permitted to be installed in air duct systems only if the wiring is directly associated with the air distribution system. The wiring shall comply with the requirements of Section 602 and the total length of such wiring shall not exceed 4 feet (1.2 m).						
	Controls not permitted to be installed through dampers		607.2.4.1	New section to specifically prohibit installation of wiring and controls through dampers unless permitted by the listing	Adopt changes		
	607.2.4.1 Controls not permitted to be installed through dampers. Mechanical, electrical and plumbing controls shall not be installed through fire dampers, smoke dampers, combination fire/smoke dampers or ceiling radiation dampers unless otherwise permitted by the manufacturer and the listing.						
	Through penetrations	607.6.1	607.6.1	The exception now specifies that it does not apply to Groups I-2 and I-3.	Adopt changes		
	607.6.1 Through penetrations. ~~In occupancies other than Groups I-2 and I-3,~~ A duct constructed of *approved* materials in accordance with Section 603 that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection provided that a *listed* fire damper is installed at the floor line or the duct is protected in accordance with Section 714.5 of the *International Building Code*. For air transfer openings, see Item 6, Section 712.1.9 of the *International Building Code*. **Exception:** In occupancies other than Groups I-2 and I-3, a duct is permitted to penetrate three floors or less without a fire damper at each floor provided that it meets all of the following requirements:						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a mini- mum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage). 2. The duct shall open into only one *dwelling unit* or *sleeping unit* and the duct system shall be continuous from the unit to the exterior of the *building*. 3. The duct shall not exceed a 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches for any 100 square feet (64 516 mm^2 per 9.3 m^2) of the floor area. 4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated. 5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 607.6.2.1.						
	Chapter 9 Specific Appliances, Fireplaces and Solid Fuel-Burning Equipment						
	General (Incinerators and Crematories	907.1	907.1	Adds a new UL standard specific for factory built cremation furnaces and commercial incinerators	Adopt changes		
	907.1 General. Factory-built cremation furnaces and commercial direct-fed incinerators shall be *listed* and *labeled* in accordance with UL 2790. Factory-built incinerators for domestic applications shall be *listed* and *labeled* in accordance with UL 791. Incinerators and cremation furnaces shall be installed ~~and labeled in accordance with UL 791 and shall be installed~~ in accordance with the manufacturer's instructions.						
	Electric Space Heaters	912		Title was updated, with changes to both 912.1 and 912.2 to specify the correct UL standard and that they must be installed in accordance with mfr instructions	Adopt changes		
	SECTION 912—~~INFRARED RADIANT HEATERS~~ ELECTRIC SPACE HEATERS **912.1 General.** ~~Electric infrared radiant~~ Permanently installed electric space heaters shall ~~comply with UL 499~~ be *listed* and *labeled* in accordance with UL 2021, and installed in accordance with the manufacturer's instructions. **912.2 Support.** Electric space heaters shall be fixed in a position independent of electric supply lines. Hangers and brackets shall be noncombustible material. **912.3 Clearances.** Heaters shall be installed with *clearances* from combustible material in accordance with the manufacturer's installation instructions.						
	Steam Bath Equipment		931	New section with UL standard and "install per mfr instructions"	Adopt changes		
	SECTION 931—STEAM BATH EQUIPMENT **931.1 General.** *Steam bath equipment* shall be *listed* and *labeled* in accordance with UL 499 and shall be installed in accordance with their listing and the manufacturer's instructions.						
	Chapter 10 Boilers, Water Heaters and Pressure Vessels						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
Yes	Scope (Boilers, Water Heaters and Pressure Vessels)	1001.1	1001.1	New exception 8 for pressure vessels in appliances and equipment regulated by Chapter 9	Retain state amendment in exception 7 and add new exception 8		
	1001.1 Scope. This chapter shall govern the installation, *alteration* and repair of boilers, water heaters and pressure vessels. **Exceptions:** 1. Pressure vessels used for unheated water supply. 2. Portable unfired pressure vessels and Interstate Commerce Commission containers. 3. Containers for bulk oxygen and medical gas. 4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m^3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within *occupancies* of Groups B, F, H, M, R, S and U. 5. Pressure vessels used in *refrigeration systems* that are regulated by Chapter 11 of this code. 6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems. 7. Any boiler or pressure vessel subject to inspection by federal or state ~~inspectors~~inspection programs. 8. Pressure vessels used in specific appliances and equipment that are regulated by Chapter 9 of this code.						
	Water heater pan required		1002.4	New section requires a water heater pan where leakage may cause damage	Accept change		May want to correlate with requirements in UPC Section 507.5 on 1-1/2 in. depth
	1002.4 Water heater pan required. Where a storage-type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan constructed of one of the following: 1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6 mm) in thickness. 2. Plastic of not less than 0.036 inch (0.9 mm) in thickness constructed of material having a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in accordance with ASTM E84 or UL 723. 3. Other *approved* materials.						
	Safety and relief valve discharge	1006.6	1006.6	Item 7 indicates that the termination of discharge should be readily visible or a leak detection device installed. Item 10 is editorial only. Item 13 changes the reference for piping materials from potable water in the plumbing code to Section 1202 for hydronic piping.	Accept changes		
	1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is *approved* for the temperature of the system. High-						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall: 1. Not be directly connected to the drainage system. 2. Discharge through an air break located in the same room as the *appliance*. 3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break. 4. Serve a single relief device and shall not connect to piping serving any other relief device or *equipment*. 5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors. 6. Discharge in a manner that does not cause personal injury or structural damage. 7. Discharge to a termination point that is readily visible and observable by the building occupants. If the discharge termination point is not readily visible and observable, a leak detection monitoring device with alarm notification (and not automatic shut-off) is required. 8. Not be trapped. 9. Be installed so as to flow by gravity. 10. ~~Not terminate~~ Terminate not more than 6 inches (152 mm) above the floor or flood level rim of the waste receptor. 11. Not have a threaded connection at the end of such piping. 12. Not have valves or tee fittings. 13. ~~Be constructed of those materials listed in Section 605.4 of the *International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1~~Utilize piping material complying with Section 1202.						
		Chapter 11 Refrigeration					
	Scope (Refrigeration)	1101.1	1101.1	Removed language that was redundant with definition.	Accept changes		
	1101.1 Scope. This chapter shall govern the design, installation, construction and repair of *refrigeration systems* ~~that vaporize and liquefy a fluid during the refrigeration cycle~~. Permanently installed refrigerant storage systems and other components shall be considered as part of the *refrigeration system* to which they are attached.						
	Refrigerants other than ammonia	1101.1.1	1101.1.1	Editorial, with an added reference to IIAR CO2 for those systems containing CO2	Accept changes		
	1101.1.1 Refrigerants other than ammonia. ~~Refrigerant piping design and installation for systems containing~~ *Refrigeration systems* using a refrigerant other than ammonia~~, including pressure vessels and pressure relief devices,~~ shall comply with this chapter, ASHRAE 15 and the *International Fire Code*. *Refrigeration systems* containing carbon dioxide as the refrigerant shall also comply with IIAR CO2.						
	Ammonia refrigerant	1101.1.2	1101.1.2	Edited for clarity and adds IIAR 6 as a required standard	Accept changes		
	1101.1.2 Ammonia refrigerant. *Refrigeration systems* using ammonia ~~as the~~ refrigerant shall comply with IIAR 2 for system design, IIAR 3 for valves, IIAR 4 for installation, IIAR 5 for start-up, and IIAR 6 and shall not be required to comply with this chapter.						
	Factory-built equipment and appliances	Table 1101.2	Table 1101.2	Removed the UL standard for refrigeration fittings as redundant to that found in 1107	Accept changes		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Group A2L, A2, A3 and B1 high probability equipment		1101.2.1	New section added for A2L refrigerant reference standards	Accept changes		
	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.						
	Maintenance	1101.6	1101.6	Removed the word "Mechanical" as all refrigeration systems should be maintained.	Accept changes		
	1101.6 Maintenance. ~~Mechanical~~ *Refrigeration systems* shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.						
	Changing refrigerant	1101.7	1101.7	Edited to be in line with ASHRAE 15	Accept changes		
	1101.7 Changing refrigerant. ~~The type of refrigerant in refrigeration systems having a refrigerant circuit containing more than 220 pounds (99.8 kg) of Group A1 or 30 pounds (13.6 kg) of any other group refrigerant shall not be changed without prior notification to the code official and compliance with the applicable code provisions for the new refrigerant type.~~ Changes of refrigerant in an existing system to a refrigerant with a different *refrigerant designation* shall be allowed only where in accordance with the following: 1. The owner or the owner's authorized agent shall be notified prior to making a change of refrigerant, and the change of refrigerant shall not be made where the owner objects to the change. 2. The change in refrigerant shall be in accordance with one of the following: 2.1. Written instructions of the original equipment manufacturer. 2.2. An evaluation of the system by a *registered design professional* or by an *approved* agency that validates safety and suitability of the replacement refrigerant. 2.3. *Approved* by the code official. 3. Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply. 4. Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this standard for a new installation, and the change of refrigerant shall require code official approval.						
	Mixing	1102.2.1	1102.2.1	Edited to be in line with ASHRAE 15	Accept changes		
	1102.2.1 Mixing. ~~Refrigerants, including refrigerant blends, with different designations in ASHRAE 34 shall not be mixed in a system.~~ Refrigerants with different *refrigerant designations* shall only be mixed in a system in accordance with both of the following: 1. The addition of a second refrigerant is allowed by the equipment manufacturer and is in accordance with the manufacturer's written instructions. 2. The resulting mixture does not change the refrigerant safety group. ~~**Exception:** Addition of a second refrigerant is allowed where permitted by the *equipment* or *appliance* manufacturer to improve oil return at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer's instructions.~~						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Refrigerant classification, amount and OEL	Table 1103.1	Table 1103.1	Updated table and new refrigerants in line with ASHRAE 34 and SSPC34	Accept changes		
	See page 39 for table with new refrigerants						
	Refrigeration System Application Requirements	1104	1104	Adds the word "Refrigeration throughout the section for clarity and consistency with ASHRAE 15	Accept changes		
	Air conditioning for human comfort	1104.3.1	1104.3.1	Requires that high probability systems must use A1 or A2L refrigerants, based on requirements in ASHRAE 15. Other refrigerants can be used if under 6.6 lbs for res or 22 lbs for commercial.	Accept changes		
	1104.3.1 Air conditioning for human comfort. ~~In other than industrial *occupancies* where the quantity in a single independent circuit does not exceed the amount in Table 1103.1, Group B1, B2 and B3 refrigerants shall not be used in high-probability systems for air conditioning for human comfort.~~ High-probability systems used for human comfort shall use Group A1 or 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*.						
	Group A2, A3, B2 and B3 refrigerants	1104.3.2	1104.3.2	Non-industrial use is deleted and the remainder updated for the use of A3 and B3 refrigerants consistent with ASHRAE 15.	Accept changes		
	1104.3.2 ~~Nonindustrial occupancies~~ Group A2, A3, B2 and B3 refrigerants. ~~Group A2 and B2 refrigerants shall not be used in high-probability systems where the quantity of refrigerant in any independent refrigerant circuit exceeds the amount shown in Table 1104.3.2. Group A3 and B3 refrigerants shall not be used except where *approved*.~~ Group A2 and B2 refrigerants shall not be used in high-probability systems. Group A3 and B3 refrigerants shall not be used except where *approved*. **Exceptions:** This section does not apply to: 1. Laboratories where the floor area 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.						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Maximum permissible quantities of refrigerants	Table 1104.3.2	NA	The table is no longer necessary with the changes to ammonia refrigerant requirements and ASHRAE 15.	Accept changes		
	Class 2 and 3 refrigerants	1106.3	1106.3	Replaced "Flammable" with "Class 2 and 3" and removed the exception as A2L is not in these classes. Consistent with ASHRAE 15.	Accept changes		
	1106.3 ~~Flammable~~ Class 2 and 3 refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the *machinery room* shall conform to the Class I, Division 2, *hazardous location* classification requirements of NFPA 70. **~~Exception:~~** ~~*Machinery rooms* for systems containing Group A2L *refrigerants* that are provided with ventilation in accordance with Section 1106.4.~~						
	Group A2L and B2L refrigerants	1106.4	1106.4	Deleted existing text and replace with a scoping section for A2l and B2L machinery rooms with new subsections 4.1, 4.2 and 4.3 consistent with the requirements of ASHRAE 15.	Accept changes		
	1106.4 ~~Special requirements for~~ Group A2L and B2L ~~refrigerant machinery rooms~~ refrigerants. *Machinery rooms* ~~with systems containing~~ for Group A2L and B2L refrigerants ~~that do not conform to the Class I, Division 2, hazardous location electrical requirements of NFPA 70, as permitted by the exception to Section 1106.3,~~ shall comply with Sections 1106.4.1 through 1106.4.3. **~~Exception:~~** ~~*Machinery rooms* conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.4.1 and 1106.4.2.~~						
	Ventilation system activation	1106.4.1		Text from 2021 deleted in its entirety based on changes in ASHRAE 15 for A2L and B2L refrigerants	Accept changes		
	~~**1106.4.1 Ventilation system activation.** Ventilation shall be activated by the refrigerant detection system in the *machinery room*. Refrigerant detection systems shall be in accordance with Section 605.8 of the *International Fire Code* and all of the following:~~ ~~1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.~~ ~~2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.4.2.~~ ~~3. The detection, signaling and control circuits shall be supervised.~~						
	Elevated temperatures	1106.2	1106.4.1	Relocated section	Accept changes		
	~~**1106.2**~~ **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.						

<table>
<tr><th>Existing State Amendment</th><th>Title or Subject</th><th>2021 IMC #</th><th>2024 IMC #</th><th>Summary</th><th>2024 Staff Recommendation</th><th>2024 TAG Member Recommendation</th><th>Other Comments</th></tr>
<tr><td></td><td>Emergency ventilation system</td><td>1106.4.2</td><td></td><td>2021 text deleted and replaced with new ventilation requirements from ASHRAE 15</td><td>Accept deletion</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">~~1106.4.2 Emergency ventilation system.~~ ~~An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 1106.4.2. Shutdown of the emergency ventilation system shall be by manual means.~~</td></tr>
<tr><td></td><td>Refrigerant detector</td><td></td><td>1106.4.2</td><td>ASHRAE 15 requires two levels of ventilation based on the response of the refrigerant detector</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">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 1106.4.2</td></tr>
<tr><td>Yes</td><td>Minimum Exhaust Rates</td><td>Table 1106.4.2</td><td></td><td>Deleted and replaced with new table based on ASHRAE 15</td><td>Accept deletion; amendment no longer needed</td><td></td><td></td></tr>
<tr><td></td><td>Group A2L and B2L detector activation</td><td></td><td>Table 1106.4.2</td><td>New table based on the two levels of ventilation required by ASHRAE 15--small leak vs. large leak</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">
TABLE 1106.4.2—GROUP A2L and B2L DETECTOR ACTIVATION
<table>
<tr><th>ACTIVATION LEVEL</th><th>MAXIMUM RESPONSE TIME (seconds)</th><th>ASHRAE 15 VENTILATION (seconds)</th><th>ALARM RESET</th><th>ALARM TYPE</th></tr>
<tr><td>Less than or equal to the OEL in Table 1103.1</td><td>300</td><td>1</td><td>Automatic</td><td>Trouble</td></tr>
<tr><td>Less than or equal to the refrigerant concentration level in Table 1103.1</td><td>15</td><td>2</td><td>Manual</td><td>Emergency</td></tr>
</table>
</td></tr>
<tr><td></td><td>Emergency ventilation system discharge</td><td>1106.4.3</td><td>NA</td><td>2021 text deleted and replaced with new ventilation requirements from ASHRAE 15</td><td>Accept deletion</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">~~1106.4.3 Emergency ventilation system discharge.~~ ~~The emergency ventilation system point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, *ventilation* opening or *exit*.~~</td></tr>
<tr><td></td><td>Mechanical ventilation</td><td></td><td>1106.4.3</td><td>Referral to ASHRAE 15 for the mechanical ventilation system requirements</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">1106.4.3 Mechanical ventilation. The *machinery room* shall have a mechanical ventilation system complying with ASHRAE 15.</td></tr>
<tr><td></td><td>Piping</td><td>1107.1</td><td>1107.1</td><td>Simplified language and removed references to ammonia</td><td>Accept change</td><td></td><td></td></tr>
</table>

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	1107.1 Piping. Refrigerant piping material ~~for other than R-717 (ammonia) systems~~ shall conform to the requirements in this section. ~~Piping material and installations for R-717 (ammonia) refrigeration systems shall comply with IIAR 2.~~						
	Refrigerant Pipe	Table 1107.4	Table 1107.4	Added standard for steel pipe	Accept change		
	Refrigerant Pipe Fittings	Table 1107.5	Table 1107.5	Added "and copper alloy (brass)"	Accept change		
	Flexible connectors, expansion and vibration compensators	1107.7	1107.7	Provides more detail for the listing requirements	Accept change		
	1107.7 Flexible connectors, expansion and vibration compensators. Flexible connectors and expansion and vibration control devices shall be *listed* and *labeled* for use in *refrigeration systems* and pressures at which the components are installed.						
	Brass (copper alloy) pipe	1108.5	NA	Removed the section as it is redundant with 1108.6; Subsequent sections renumbered	Accept deletion		
	Refrigerant pipe enclosure	1109.2.2	1109.2.2	Added a section for outside the building, consistent with ASHRAE 15	Accept change		
	1109.2.2 Refrigerant 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*: 4.1. Where protected from damage from the weather, including but not limited to hail, ice and snow loads. 4.2. Where protected from damage within the expected foot or traffic path. 4.3. Where installed underground not less than 8 inches (200 mm) below finished grade and protected against corrosion.						
	Prohibited location	1109.2.3	1109.2.3	Added "Exposed" to "within an interior exit stair"	Accept change		
	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.						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Exposed piping surface temperature	1109.2.6	1109.2.6	Specifies that the section only applies where "ready access" can be by unauthorized personnel.	Accept change		
	1109.2.6 Exposed piping surface temperature. Exposed piping having surface temperatures greater than 120°F (49°C) or less than 5°F (-15°C) with *ready access* to nonauthorized personnel 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 (49°C).						
	Pipe identification	1109.2.7	1109.2.7	Marking for A2L and B2L piping was modified to meet ASHRAE 15 requirements	Accept change		
	1109.2.7 Pipe identification. Refrigerant 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 $^{1}/_{2}$ 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."						
	Installation requirements for A2, A3, B2 or B3 refrigerant	1109.3	1109.3	For consistency with ASHRAE 15. A2, A3, B2 and B3 were combined with A2L and B2L within ASHRAE 15.	Accept change		
	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 Sections 1109.3.1 and 1109.3.2.						
	Protection against physical damage	1109.3.1	1109.3.1	Added A2, A3, B2, and B3 per the previous change	Accept change		
	1109.3.1 ~~Pipe protection~~ Protection against physical damage. In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group A2, A3, 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 ~~1 1/2~~ $1^{1}/_{4}$ inches (32 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~~ shall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.						
	Shield plates		1109.3.1.1	The requirement located previously in 1109.3.1 was moved to its own section	Accept change		
	1109.3.1.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.46 mm) (No. 16 gage).						
	Shaft ventilation	1109.3.2	1109.3.2	With the combining of A2 and A2L et al, specific ventilation requirements for A2, A3, B2 and B3 were added in this section from 1109.4.2	Accept change		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	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 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.						
	Installation requirements for A2, A3, B2 or B3 refrigerant	1109.4/1109.4.1/ 1109.4.2	NA	These sections were removed. For consistency with ASHRAE 15. A2, A3, B2 and B3 were combined with A2L and B2L within ASHRAE 15. Subsequent sections renumbered	Accept deletion		
	Condensate control	1109.7	NA	It was felt this section was unenforceable.	Accept deletion		
	~~**1109.7 Condensate control.** Refrigerating piping and fittings that, during normal operation, will reach a surface temperature below the dew point of the surrounding air, and are located in spaces or areas where condensation has the potential to cause a safety hazard to the building occupants, structure, electrical *equipment* or any other *equipment* or *appliances*, shall be insulated or protected in an *approved* manner to prevent damage from condensation.~~						
	Field test gasses	1110.3	1110.3	Adds an allowance for the use of premixed nitrogen with a tracer gas, or hydrogen or helium. Consistency with ASHRAE 15	Accept change		
	1110.3 Field test gases. The medium used for field pressure testing the *refrigeration system* shall be one of the following inert gases: oxygen-free nitrogen, helium argon or premixed nonflammable oxygen-free nitrogen with a tracer gas of hydrogen or helium. For R-744 refrigeration systems, carbon dioxide shall be allowed as the test medium. For R-718 *refrigeration systems*, water shall be allowed as the test medium.						
	Test gases not permitted		1110.3.1	Moved portion of former section to a new subsection	Accept change		
	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.						
	Factory test procedure		1110.4	Aligns requirements for test gases with ASHRAE 15	Accept change		
	1110.4 Factory test procedure. Factory tests shall be performed with dry nitrogen or other nonflammable, nonreactive, dried gas. Oxygen, air or mixtures containing them shall not be used. The means used to build up the test pressure shall have either a pressure- limiting device or a pressure-reducing device and a gauge on the outlet side. The pressure-relief device shall be set above the test pressure but low enough to prevent permanent deformation of the *refrigeration system's*						

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	components. **Exceptions:** 1. Mixtures of dry nitrogen, inert gases or a combination of them with Class 1 refrigerant in concentrations of a refrigerant weight fraction (mass fraction) not exceeding 5 percent shall be permitted for tests. 2. Mixtures of dry nitrogen, inert gases or a combination of them with Class 2L, Class 2 and Class 3 refrigerants in concentrations not exceeding the lower of a refrigerant weight fraction (mass fraction) of 5 percent or 25 percent of the LFL shall be permitted for tests. 3. Compressed air without added refrigerants shall be permitted for tests, provided that the *refrigeration system* is subsequently evacuated to less than 1,000 microns (0.1333 kPa) before charging with refrigerant. The required evacuation level is atmospheric pressure for *refrigeration systems* using R-718 (water) or R-744 (carbon dioxide) as the refrigerant. 4. Systems erected on the premises using Group A1 refrigerant and with copper tubing not exceeding 0.62 of an inch (15.7 mm) outside diameter shall be tested by means of the refrigerant charged into the system at the saturated vapor pressure of the refrigerant at not less than 68°F (20°C).						
	Test apparatus	1110.4	1110.5	No change other than numbering	Accept change		
	Piping system strength test	1110.5	1110.6	Rewritten for consistency with ASHRAE 15	Accept change		
	1110.6 Piping system ~~pressure test and leak~~ strength test. ~~The refrigerant piping system shall be tested as a whole or separate tests shall be conducted for the low-pressure side and high-pressure side of the piping system. The refrigerant piping system shall be tested in accordance with both of the following methods:~~ Refrigeration 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, 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 piping and tubing greater than ¾ inch (19 mm) in diameter shall be tested in accordance with ASHRAE 15. ~~1. The system shall be pressurized for a period of not less than 60 minutes to not less than the lower of the design pressures or the setting of the pressure relief device(s). The design pressures for testing shall be the pressure *listed* on the label nameplate of the condensing unit, compressor, compressor unit, pressure vessel or other system component with a nameplate. Additional test gas shall not be added to the system after the start of the pressure test. The system shall not show loss of pressure on the test pressure measuring device during the pressure test. Where using refrigerant as a test medium in accordance with Section 1110.3, the test pressure shall be not less than the saturation dew point pressure at 77°F (25°C).~~ ~~2. A vacuum of 500 microns shall be achieved. After achieving a vacuum, the system shall be isolated from the vacuum pump. The system pressure shall not rise above 1,500 microns for a period of not less than 10 minutes.~~						
	Joints and refrigerant containing parts in air ducts Limited charge systems **Booster compressor** Centrifugal/nonpositive displacement compressors	1110.5.1 1110.5.2 1110.6 1110.7	NA	Sections removed based on changes to ASHRAE 15	Accept deletion		
	Contractor or engineer declaration	1110.8	1110.7	No substantive change other than numbering	Accept change		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
		Chapter 12 Hydronic Piping					
	Scope	1201.1	1201.1	Adds items included in chapter but previously left out of the scoping	Accept change		
	1201.1 Scope. The provisions of this chapter shall govern the construction, installation, *alteration* and repair of hydronic piping systems. This chapter shall apply to hydronic piping systems that are part of heating, ventilation and air-conditioning systems. Such piping systems shall include steam, hot water, radiant heating, radiant cooling, chilled water, steam condensate, ground source heat pump loop systems, and snow- and ice-melting. Potable cold and hot water distribution systems shall be installed in accordance with the *International Plumbing Code*.						
	Hydronic Pipe	Table 1202.4	Table 1202.4	Adds stainless steel tubing and adds a new ASTM standard for stainless steel pipe; removes lead	Accept change		
	Hydronic Pipe Fittings	Table 1202.5	Table 1202.5	Adds stainless steel and new standards for copper, PE-RT, PEX and steel	Accept change		
	[Joint preparation and installation]	1203.3.4	1203.3.4	Allows the use of green solvent cement for higher contrast upon inspection	Accept change		
	1203.3.4 Joint surfaces shall be clean and free from moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces: 1. ASTM D2235 for ABS joints. 2. ASTM F493 for CPVC joints. 3. ASTM D2564 for PVC joints. CPVC joints shall be made in accordance with ASTM D2846. **Exception:** For CPVC pipe joint connections, a primer is not required where all of the following conditions apply: 1. The solvent cement used is *third-party certified* as conforming to ASTM F493. 2. The solvent cement is yellow or green in color. 3. The solvent cement is used only for joining $^{1}/_{2}$-inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings. 4. The CPVC pipe or fittings are manufactured in accordance with ASTM D2846						
	Polybutylene plastic pipe and tubing	1203.9/1203.9.1	NA	Removed as PB is no longer in use; subsequent sections renumbered	Accept change		
	Stainless steel pipe		1203.13	Added new section to include stainless steel in hydronic systems	Accept change		
	1203.13 Stainless steel pipe. Joints between stainless steel pipe or fittings shall be mechanical joints that are made with an *approved* elastomeric seal, or shall be threaded or welded joints conforming to Section 1203.3.						

<table>
<tr><th>Existing State Amendment</th><th>Title or Subject</th><th>2021 IMC #</th><th>2024 IMC #</th><th>Summary</th><th>2024 Staff Recommendation</th><th>2024 TAG Member Recommendation</th><th>Other Comments</th></tr>
<tr><td></td><td>Stainless steel tubing</td><td></td><td>1203.14</td><td>Added new section to include stainless steel in hydronic systems</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">1203.14 Stainless steel tubing. Joints between stainless steel tubing or fittings shall be mechanical or welded joints conforming to Section 1203.3.</td></tr>
<tr><td></td><td>Where required (valves)</td><td>1205.1</td><td>1205.1</td><td>adds "Access shall be provided to all full open valves and shutoff valves."</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">1205.1 Where required. Shutoff valves shall be installed in hydronic piping systems in the locations indicated in Sections 1205.1.1 through 1205.1.6. Access shall be provided to all full-open valves and shutoff valves.</td></tr>
<tr><td></td><td>Materials (embedded pipe)</td><td>1209.1</td><td>1209.1</td><td>Removes PB from materials list</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td>PB joints</td><td>1209.3.3</td><td>NA</td><td>Removes PB specs; subsequent sections renumbered</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td>Radiant tubing placement</td><td></td><td>1209.6, 1209.6.1, 1209.6.2, 1209.6.3, Table 1209.6.1</td><td>New sections and table detailing proper installation of radiant heating and cooling tubing</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">1209.6 Radiant tubing placement. Hydronic tubing to be embedded for the purpose of radiant heating or cooling shall be installed in accordance with the manufacturer's instructions and with the tube layout and spacing in accordance with the system design. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.
1209.6.1 Radiant tubing circuit length. The maximum circuit length of radiant tubing from a supply-and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer's specifications, the lengths specified in Table 1209.6.1.
<table>
<tr><th colspan="2">TABLE 1209.6.1—MAXIMUM CIRCUIT LENGTH OF RADIANT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT</th></tr>
<tr><th>NOMINAL TUBE SIZE</th><th>MAXIMUM CIRCUIT LENGTH (feet)</th></tr>
<tr><td>1/4</td><td>125</td></tr>
<tr><td>5/16</td><td>200</td></tr>
<tr><td>3/8</td><td>250</td></tr>
<tr><td>1/2</td><td>300</td></tr>
<tr><td>5/8</td><td>400</td></tr>
<tr><td>3/4</td><td>500</td></tr>
<tr><td>1</td><td>750</td></tr>
<tr><td colspan="2">For SI: 1 foot = 304.8 mm.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Existing State Amendment</th><th>Title or Subject</th><th>2021 IMC #</th><th>2024 IMC #</th><th>Summary</th><th>2024 Staff Recommendation</th><th>2024 TAG Member Recommendation</th><th>Other Comments</th></tr>
<tr><td></td><td colspan="7">1209.6.2 Radiant tubing circuit tags. Each individual radiant tubing circuit shall have a tag or label securely affixed to each manifold outlet to indicate the length of each circuit and the areas served.
1209.6.3 Radiant tubing drawings. The radiant tubing drawings and design report shall be provided to the building owner or the designated representative of the building owner.</td></tr>
<tr><td></td><td>Snow and ice melt tubing placement</td><td></td><td>1209.7, 1209.7.1, 1209.7.2, Table 1209.7.1</td><td>New sections and table detailing proper installation of snow melt systems</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td colspan="7">1209.7 Snow- and ice-melt tubing placement. Hydronic tubing to be embedded for the purpose of snow- and ice-melt systems shall be installed in accordance with the manufacturer’s installation instructions and with the tube layout and spacing in accordance with the system design.
1209.7.1 Snow- and ice-melt tubing circuit length. The maximum circuit length of snow- and ice-melt tubing from a supply- and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer’s specifications, the lengths specified in Table 1209.7.1. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.
<table>
<tr><th colspan="2">TABLE 1209.7.1—MAXIMUM CIRCUIT LENGTH OF SNOW- AND ICE-MELT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT</th></tr>
<tr><th>NOMINAL TUBE SIZE</th><th>MAXIMUM CIRCUIT LENGTH (feet)</th></tr>
<tr><td>1/2</td><td>140</td></tr>
<tr><td>5/8</td><td>250</td></tr>
<tr><td>3/4</td><td>325</td></tr>
<tr><td>1</td><td>475</td></tr>
<tr><td colspan="2">For SI: 1 foot = 304.8 mm.</td></tr>
</table>
1209.7.2 Snow- and ice-melt tubing drawings. The snow- and ice-melt tubing drawings and design report shall be provided to the building owner or the designated representative of the building owner.</td></tr>
<tr><td></td><td>Ground source loop pipe</td><td>Table 1210.4</td><td>Table 1210.4</td><td>Adds new standard for PEX</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td>Ground source loop pipe fittings</td><td>Table 1210.5</td><td>Table 1210.5</td><td>Adds new standards for PEX, PE-RT</td><td>Accept change</td><td></td><td></td></tr>
<tr><td></td><td>Joints</td><td>1210.6</td><td>1210.6</td><td>Editorial only</td><td>Accept change</td><td></td><td></td></tr>
<tr><td colspan="2"></td><td colspan="6">Chapter 15 Referenced Standards</td></tr>
<tr><td></td><td colspan="7">The following standards were updated:</td></tr>
</table>

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
		ACCA Manual D, ACCA 183; **AHRI** 700; **AMCA** 550, 210, 230; **ANSI** Z21.1, Z21.8; **ASHRAE** 15, 34, 62.1, 170; **ASME** B1.1, B1.13, B1.20.1, B1.20.3, B16.5, B16.9, B16.15, B16.18, B16.22, B16.24, B16.26, B31.5, B31.9, BPVC, CSD-1; **ASSE** 1061, 1079; **ASSP** Z359.1; **ASTM** A53/53M, A105/105M, A106/106M, A126, A181/181M, A193/193M, A234/234M, A240/240M, A254/254M, A269/269M, A312/312M, A334.334M, A395/395M, A420/420M, A536, B32, B42, B43, B68/68M, B75/75M, B88, B280, B819, C315, C411, D56, D93, D1693, D1785, D2235, D2241, D2412, D2466, D2467, D2564, D2683, D2737, D2846/2846M, D3035, D3278, E119, E136, E2231, E2236, F437, F439, F441/441M, F442/442M, F493, F714, F876, F877, F1281, F1476, F1807, F1924, F1960, F1974, F2080, F2098, F2159, F2389, F2464, F2623, F2735, F2769, F2806, F2855, F3226/3226M, F3253; **AWS** A5.8M/A5.8 **AWWA** C110/A21.10, C115/A21.15, C151/A21.53, C901; **CPSC** Title 15; **CSA** C448 Series, B137.1, B137.2, B137.3, B137.5, B137.6, B137.9, B137.10, B137.11, B137.18 **ICC** IBC, IECC, IFC, IFGC, IRC, ICC 900/SRCC Std 300, ICC 901/SRCC Std 100; **IIAR** IIAR2; **MSS** SP-58; **NBBI** NBIC;		Accept all changes		
		NFPA 2, 30A, 37, 58, 70, 72, 80, 85, 92, 96, 99, 105, 211, 262, 286, 704; **NSF** 14, 358.1, 358.2, 358.3; **SMACNA** 002, 005, 006; **UL** 103, 109, 127, 174, 180, 181, 207, 263, 268, 268A, 343, 391, 427, 471, 484, 499, 507, 508, 536, 555C, 555S, 705, 710, 710B, 723, 732. 791, 834, 842, 858. 864, 867, 875, 923, 959, 1240, 1369, 1479, 1482, 1563, 1777, 1812, 1815, 1887, 1978, 1996, 2024, 2075, 2158, 2158A, 2162, 2200, 2518, 2846, 60335-2-40, 60335-2-89				
	The following standards are **new**:						
		AISI S220, S240; **ASHRAE/ACCA** 183; **ASTM** A333/A333M, A778/A778M, F3347, F3348;**CSA** C22.2 No. 62282-2-100,			Accept all added standards		

Existing State Amendment	Title or Subject	2021 IMC #	2024 IMC #	Summary	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
		C22.2 No. 62282-3-100;**IIAR** 6**SMACNA** 022 Phenolic duct construction stds, **SMACNA** Fibrous glass duct construction stds;**UL** 921, 2021, 2790					
New Appendices							
New Appendix D Clean Air Delivery				Requires MERV 13 filers in Group A, B, E and I	Do not adopt/conflicts with Section 605.4		
New Appendix E Clean Air Delivery and Monitoring				Required CO2 sensors for every 500 square feet of occupiable space in Groups A, B, E and I	Do not adopt statewide/can be adopted locally by AHJ		

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							(F) DEGREES OF HAZARD[a]
				RCL			LFL			OEL	
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
R-11[c]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.1	—	—	—	1,000	2-0-0[b]
R-12[c]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	—	—	—	1,000	2-0-0[b]
R-13[c]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—	—	—	—	1,000	2-0-0[b]
R-13B1[c]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—	—	—	—	1,000	2-0-0[b]
R-13I1	CF_3I	trifluoroiodomethane	A1	1.0	2,000	16	—	—	—	500	—
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400	—	—	—	1,000	2-0-0[b]
R-22	$CHClF_2$	chlorodifluoromethane	A1	13	59,000	210	—	—	—	1,000	2-0-0[b]
R-23	CHF_3	trifluoromethane (fluoroform)	A1	7.3	41,000	120	—	—	—	1,000	2-0-0[b]
R-30	CH_2Cl_2	dichloromethane (methylene chloride)	B1	—	—	—	—	—	—	—	—
R-31	CH_2ClF	chlorofluoromethane	—	—	—	—	—	—	—	—	—
R-32	CH_2F_2	difluoromethane (methylene fluoride)	A2L	4.8	36,000	77	19.1	144,000	306	1,000	1-4-0
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—	—	—	—	—	—
R-41	CH_3F	fluoromethane (methyl fluoride)	—	—	—	—	—	—	—	—	—
R-50	CH_4	methane	A3	—	—	—	—	50,000	—	1,000	—
R-113[c]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20	—	—	—	1,000	2-0-0[b]
R-114[c]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140	—	—	—	1,000	2-0-0[b]
R-115	$CClF_2CF_3$	chloropentafluoroethane	A1	47	120,000	760	—	—	—	1,000	—
R-116	CF_3CF_3	hexafluoroethane	A1	34	97,000	550	—	—	—	1,000	1-0-0
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57	—	—	—	50	2-0-0[b]
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56	—	—	—	1,000	2-0-0[b]
R-125	CHF_2CF_3	pentafluoroethane	A1	23	75,000	370	—	—	—	1,000	2-0-0[b]
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	13	50,000	210	—	—	—	1,000	2-0-0[b]
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	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

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL—continued

CHEMICAL			REFRIGERANT	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE	(F) DEGREES

REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	SAFETY GROUP CLASSIFICATION	RCL			LFL			OEL	OF HAZARD[a]
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	4.0	34,000	64	1,000	—
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	43	90,000	690	—	—	—	1,000	2-0-0[b]
R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	36	84,000	580	—	—	—	1,000	—
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	21	55,000	340	—	—	—	1,000	2-0-0[b]
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190				300	2-0-0[b]
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-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	6.6	27,000	110	—	—	—	1,000	2-0-0[b]
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120	—	—	—	1,000	2-0-0[b]
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84	—	—	—	1,000	2-0-0[b]
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270	—	—	—	1,000	2-0-0[b]
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240	—	—	—	1,000	2-0-0[b]
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120	—	—	—	1,000	2-0-0[b]
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-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500	—	—	—	1,000	2-0-0[b]
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/42.5)	—	16	57,000	260	—	—	—	1,000	—
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-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300	—	—	—	1,000	2-0-0[b]
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330	—	—	—	1,000	2-0-0[b]
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290	—	—	—	1,000	2-0-0[b]
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250	—	—	—	1,000	2-0-0[b]
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280	—	—	—	1,000	2-0-0[b]
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	20	95,000	320	—	—	—	1,000	—
R-407G	zeotrope	R-32/125/134a (2.5/2.5/95.0)	A1	13	52,000	210	—	—	—	1,000	—
R-407H	zeotrope	R-32/125/134a (32.5/15.0/52.5)	A1	19	92,000	300	—	—	—	1,000	—
R-407I	zeotrope	R-32/125/124a (19.5/8.5/72.0)	A1	16	71,100	250	—	—	—	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-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110	—	—	—	1,000	2-0-0[b]
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120	—	—	—	1,000	2-0-0[b]
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420	—	—	—	1,000	2-0-0[b]

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL—continued

CHEMICAL			REFRIGERANT	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE	(F) DEGREES

REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	SAFETY GROUP CLASSIFICATION	RCL			LFL			OEL	OF HAZARD[a]
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430	—	—	—	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	55,000	185.6	970	—
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	14.8	70,000	238.3	940	—
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	20.5	87,000	328.6	1,000	—
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	93	23.4	88,000	374.9	1,000	—
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	6.4	26,000	100	—	—	—	1,000	—
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	6.0	23,000	96	—	—	—	1,000	—
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	—	—	—	1,000	—
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	—	—	—	1,000	—
R-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	3.9	14,000	62	—	—	—	1,000	2-0-0[b]
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-417C	zeotrope	R-125/134a/600 (19.5/78.8/1.7)	A1	5.4	21,000	87	—	—	—	1,000	—
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	19.2	89,000	308.4	1,000	—
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	16.7	60,000	268.6	1,000	—
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	18.5	69,000	297.3	1,000	—
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	44,000	180	—	—	—	1,000	2-0-0[b]
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280	—	—	—	1,000	2-0-0[b]
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330	—	—	—	1,000	2-0-0[b]
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290	—	—	—	1,000	2-0-0[b]
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250	—	—	—	1,000	2-0-0[b]
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290	—	—	—	1,000	2-0-0[b]
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260	—	—	—	1,000	2-0-0[b]
R-422E	zeotrope	R-125/134a/600a (58.0/39.3/2.7)	A1	16	57,000	260	—	—	—	1,000	—
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	300	—	—	—	1,000	2-0-0[b]
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	6.2	23,000	100	—	—	—	990	2-0-0[b]
R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260	—	—	—	1,000	2-0-0[b]
R-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	A1	5.2	20,000	83	—	—	—	990	—
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	18	79,000	290	—	—	—	1,000	2-1-0
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	84,000	370	—	—	—	1,000	—
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	—

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL—continued

CHEMICAL			REFRIGERANT	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE	(F) DEGREES

REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	SAFETY GROUP CLASSIFICATION	RCL			LFL			OEL	OF HAZARD[a]
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	5.2	32,000	44.0	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	750	—
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.39	3,500	6.3	2.0	18,000	32.1	950	—
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,700	6.5	2.0	18,000	83.8	790	—
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	20	73,000	320	—	—	—	1,000	—
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	0.50	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	8.2	2.0	16,000	32.7	1,000	—
R-436C	zeotrope	R-290/600a (95.0/5.0)	A3	0.57	5,000	9.1	2.3	20,000	36.5	1,000	—
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.1	19,000	82	—	—	—	990	—
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	4.9	20,000	79	—	—	—	990	—
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	1,000	—
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	7.8	46,000	124.7	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-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	21	100,000	330	—	—	—	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	640	—
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2L	5.1	21,000	81	19.9	82,000	324.8	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	930	—
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	960	—
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	960	—
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2L	2.6	16,000	42	20.6	121,000	312.7	970	—
R-448A	zeotrope	R-32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)	A1	24	110,000	390	—	—	—	860	—
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	—	—	—	840	—
R-449B	zeotrope	R-32/125/1234yf/134a (25.2/24.3/23.2/27.3)	A1	23	100,000	370	—	—	—	850	—
R-449C	zeotrope	R-32/125/1234yf/134a (20.0/20.0/31.0/29.0)	A1	23	98,000	360	—	—	—	800	—

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL—continued

CHEMICAL			REFRIGERANT	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE	(F) DEGREES

REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	SAFETY GROUP CLASSIFICATION	RCL			LFL			OEL	OF HAZARD[a]
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
R-450A	zeotrope	R-134a/1234ze(E) (42.0/58.0)	A1	20	72,000	320	—	—	—	880	—
R-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2L	5.0	18,000	81	20.3	70,000	326.6	530	—
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2L	5.0	18,000	81	20.3	70,000	326.6	530	—
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	100,000	440	—	—	—	790	—
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	870	—
R-452C	zeotrope	R-32/125/1234yf (12.5/61.0/26.5)	A1	27	100,000	430	—	—	—	810	—
R-453A	zeotrope	R-32/125/134a/227ea/600/601a (20.0/20.0/53.8/5.0/0.6/0.6)	A1	7.8	34,000	120	—	—	—	1,000	—
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	22.0	77,000	352.6	850	—
R-454C	zeotrope	R-32/1234yf (21.5/78.5)	A2L	4.4	19,000	71	18,0	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-456A	zeotrope	R-32/134a/1234ze(E) (6.0/45.0/49.0)	A1	20	77,000	320	—	—	—	900	—
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-457B	zeotrope	R-32/1234yf/152a (35.0/55.0/10.0)	A2L	3.7	19,000	59	14.9	76,000	239	730	—
R-458A	zeotrope	R-32/125/134a/227ea/236fa (20.5/4.0/61.4/13.5/0.6)	A1	18	76,000	280	—	—	—	1,000	—
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	30	25,000	92	23.3	99,000	373.5	640	—
R-460A	zeotrope	R-32/125/134a/1234ze(E) (12.0/52.0/14.0/22.0)	A1	24	92,000	380	—	—	—	950	—
R-460B	zeotrope	R-32/125/134a/1234ze(E) (28.0/25.0/20.0/27.0)	A1	25	120,000	400	—	—	—	950	—
R-460C	zeotrope	R-32/125/134a/1234ze(E) (2.5/2.5/46.0/49.0)	A1	20	73,000	310	—	—	—	900	—
R-461A	zeotrope	R-125/143a/134a/227ea/600a (55.0/5.0/32.0/5.0/3.0)	A1	17	61,000	270	—	—	—	1,000	—
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	105,000	265.8	1,000	—
R-463A	zeotrope	R-744/32/125/1234yf/134a (6.0/36.0/30.0/14.0/14.0)	A1	19	98,000	300	—	—	—	990	—
R-464A	zeotrope	R-32/125/1234ze(E)/227ea (27.0/27.0/40.0/6.0)	A1	27	120,000	430	—	—	—	930	—

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL—continued

CHEMICAL REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							(F) DEGREES OF HAZARD[a]
				RCL			LFL			OEL	
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
R-465A	zeotrope	R-32/290/1234yf (21.0/7.9/71.1)	A 2	2.5	12,000	40	10.0	98,000	160.9	660	—
R-466A	zeotrope	R-32/125/13I1 (49.0/11.5/39.5)	A1	6.2	30,000	99	—	—	—	860	—
R-467A	zeotrope	R-32/125/134a/600a (22.0/5.0/72.4/0.6)	A2L	6.7	31,000	110	—	—	—	1,000	—
R-468A	zeotrope	R-1132a/32/1234yf (3.5/21.5/75.0)	A2L	4.1	18,000	66	—	—	—	610	—
R-469A	zeotrope	R-744/R-32/R-125 (35.0/32.5/32.5)	A1	8	53,000	—	—	—	—	1,600	—
R-470A	zeotrope	R-744/32/125/134a/1234ze(E)/227ea (10.0/17.0/19.0/7.0/44.0/3.0)	A1	17	77,000	270	—	—	—	1,100	—
R-470B	zeotrope	R-744/32/125/134a/1234ze(E)/227ea (10.0/17.0/19.0/7.0/44.0/3.0)	A1	16	72,000	270	—	—	—	1,100	—
R-471A	zeotrope	R-1234ze(E)/227ea/1336mzz(E) (78.7/4.3/17.0)	A1	9.7	31,000	160	—	—	—	710	—
R-472A	zeotrope	R-744/32/134a (69.0/12.0/19.0)	A1	4.5	35,000	72	—	—	—	2,700	—
R-500[d]	azeotrope	R-12/152a (73.8/26.2)	A1	7.4	29,000	120	—	—	—	1,000	2-0-0[b]
R-501[c]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	—	—	—	1,000	—
R-502[d]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	—	—	—	1,000	2-0-0[b]
R-503[d]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	—	—	—	1,000	2-0-0[b]
R-504[c]	azeotrope	R-32/115 (48.2/51.8)	—	28	140,000	450	—	—	—	1,000	—
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	510	—	—	—	1,000	2-0-0[b]
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220	—	—	—	1,000	2-0-0[b]
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200	—	—	—	1,000	2-0-0[b]
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	380	—	—	—	1,000	2-0-0[b]
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	3.5	29,000	56.1	1,000	—
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	2.4	21,000	38.0	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-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320	—	—	—	650	—
R-513B	azeotrope	R-1234yf/134a (58.5/41.5)	A1	21	74,000	330	—	—	—	640	—
R-514A	azeotrope	R-1336mzz(S)/1130(E) (74.7/25.3)	B1	0.86	2,400	14	—	—	—	320	—
R-515A	azeotrope	R-1234ze(E)/227ea (88.0/12.0)	A1	19	63,000	300	—	—	—	810	—
R-515B	azeotrope	R-1234ze(E)/227ea (91.1/8.9)	A1	18	61,000	290	—	—	—	810	—
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	3.2	13,000	5 2	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

TABLE 1103.1—REFRIGERANT CLASSIFICATION, AMOUNT AND OEL—continued

CHEMICAL REFRIGERANT	FORMULAS	CHEMICAL NAME OF BLENDS	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							(F) DEGREES OF HAZARD[a]
				RCL			LFL			OEL	
				lb/MCf	ppm	g/m³	lb/MCf	ppm	g/m³	ppm	
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	$CH_3CH_2CH_2\ CH_2CH_3$	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-610	$CH_3CH_2OCH_2CH_3$	ethoxyethane (ethyl ether)	—	—	—	—	—	—	—	400	—
R-611	$HCOOCH_3$	methyl formate	B2	—	—	—		—	—	100	—
R-717	NH_3	ammonia	B2L	0.014	320	0.22	7.2	167,000	116	25	3-3-0[c]
R-718	H_2O	water	A1	—	—	—	—	—	—	—	0-0-0
R-744	CO_2	carbon dioxide	A1	4.5	40,000	72	—	—	—	5,000	2-0-0[b]
R-1130(E)	CHCl=CHCl	trans-1,2-dichloroethene	B2	0.25	1,000	4	16	65,000	258	200	—
R-1132a	$CF_2=CH_2$	1,1-difluoroethylene	A2	2.0	13,000	33	8.1	50,000	131	500	—
R-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	2.2	31,000	36	200	1-4-2
R-1224yd(Z)	$CF_3CF=CHCl$	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	370	—	—	—	1,000	—
R-1233zd(E)	$CF_3CH=CHCl$	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85	—	—	—	800	—
R-1234yf	$CF_3CF=CH_2$	2,3,3,3-tetrafluoro-1-propene	A2L	4.5	16,000	75	18.0	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-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7	—	—	—	500	1-4-1
R-1336mzz(E)	$CF_3CHCHCF_3$	trans 1,1,1,4,4,4-hexafluoro-2- butene	A1	3.0	7,200	48	—	—	—	400	—
R-1336mzz(Z)	$CF_3CHCHCF_3$	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	5.2	13,000	84	—	—	—	500	—

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m³.

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.