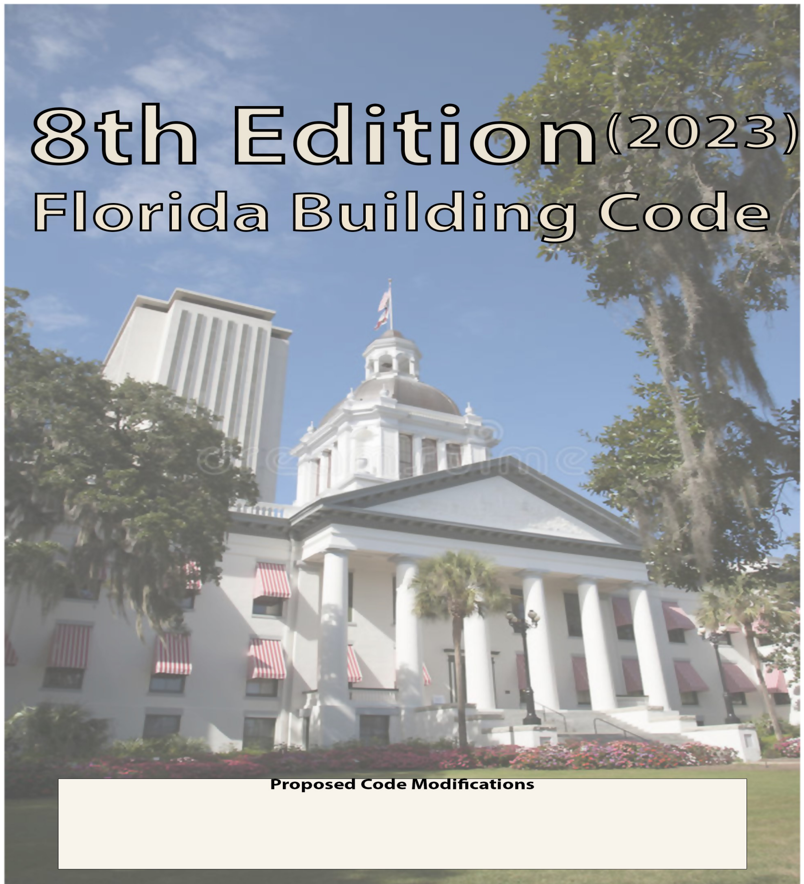

ICC 2021 Code Changes

This document created by the Florida Department of Business and Professional Regulation - 850-487-1824

TAC: Mechanical

Total Mods for **Mechanical** in **Approved as Submitted – Consent: 68**

Total Mods for report: 97

Sub Code: Existing Building

M9717/EB127-19

1

Date Submitted	3/12/2021	**Section**	1301.6.7.1	**Proponent**	Mo Madani
Chapter	14	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

1301.6.7.1

Chapter 13 in the IEBC is chapter 14 in the FBC-EB.

Summary of Modification

Modifies text of 1301.6.7.1 "Categories", adds text to item 5 "; or where systems have no ductwork."

Rationale

The stated intent of Section 1301.6.7 is to “evaluate the ability of the HVAC system to resist the movement of smoke and fire.” Points are awarded to systems with a limited ability to spread smoke and fire, such as systems serving only one story. The code is silent regarding instances where the heating and air conditioning systems do not utilize ductwork, thus eliminating the risk of spreading smoke and fire. Without heating and air conditioning ductwork, the degree of code compliance and fire safety is equal or greater than category “e” and points should be gained.

Approved as Submitted

2018 International Existing Building Code

Revise as follows:

1301.6.7.1 Categories.The categories for HVAC systems are:

1. Category a—Plenums not in accordance with Section 602 of the International Mechanical Code. -10 points.
2. Category b—Air movement in egress elements not in accordance with Section 1020.5 of the International Building Code. -5 points.
3. Category c—Both Categories a and b are applicable. -15 points.
4. Category d—Compliance of the HVAC system with Section 1020.5 of the International Building Code and Section 602 of the International Mechanical Code. 0 points.
5. Category e—Systems serving one story; or a central boiler/chiller system without ductwork connecting two or more stories~~.~~ ; or where systems have no ductwork. +5 points.

Code Change No: EB127-19

Original Proposal

Section(s): 1301.6.7.1

Proponents: Kevin Duerr-Clark, NYS Department of State, representing NYS Department of State (kevin.duerr-clark@dos.ny.gov); Erika Krieger, NYS Department of State, representing NYS Department of State (codeczar@optonline.net)

2018 International Existing Building Code

Revise as follows:

1301.6.7.1 Categories. The categories for HVAC systems are:

1. Category a—Plenums not in accordance with Section 602 of the International Mechanical Code. -10 points.
2. Category b—Air movement in egress elements not in accordance with Section 1020.5 of the International Building Code. -5 points.
3. Category c—Both Categories a and b are applicable. -15 points.
4. Category d—Compliance of the HVAC system with Section 1020.5 of the International Building Code and Section 602 of the International Mechanical Code. 0 points.
5. Category e—Systems serving one story; or a central boiler/chiller system without ductwork connecting two or more stories~~.~~ <u>; or where systems have no ductwork.</u> +5 points.

Reason: The stated intent of Section 1301.6.7 is to "evaluate the ability of the HVAC system to resist the movement of smoke and fire." Points are awarded to systems with a limited ability to spread smoke and fire, such as systems serving only one story. The code is silent regarding instances where the heating and air conditioning systems do not utilize ductwork, thus eliminating the risk of spreading smoke and fire. Without heating and air conditioning ductwork, the degree of code compliance and fire safety is equal or greater than category "e" and points should be gained.

Cost Impact: The code change proposal will decrease the cost of construction
There is a small likelihood that points potentially gained by this code change would result in a decrease in cost. This is dependent on the total building score on Table 1301.7 and other decisions made by the applicant.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved as ductless systems should be provided additional credit as they do not contain ducts which could transfer smoke. Currently no credit is given. (Vote: 13-0)

Assembly Action: **None**

Final Action

EB127-19 **AS**

Sub Code: Mechanical

M8440/M2-18

2

Date Submitted 1/28/2021	**Section** 202	**Proponent** Mo Madani
Chapter 2	**Affects HVHZ** Yes	**Attachments** Yes

TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Summary of Modification

These two definitions are proposed the clarify the difference between direct and indirect evaporative cooling. Additionally, these definitions are proposed as part of this proponents proposal to IMC 602.2 and 603.5.1.

Rationale

: These two definitions are proposed the clarify the difference between direct and indirect evaporative cooling. Additionally, these definitions are proposed as part of this proponents proposal to IMC 602.2 and 603.5.1.

SECTION 202
GENERAL DEFINITIONS

Add new definition as follows:

INDIRECT EVAPORATIVE COOLING. The evaporative cooling process where water evaporates into a secondary air stream, removing heat from a primary air stream utilizing a heat exchanger.

DIRECT EVAPORATIVE COOLING. The evaporative cooling process where water evaporates directly into the air stream, reducing the air's dry-bulb temperature and raising its humidity level.

Code Change No: M2-18

Original Proposal

Section(s): SECTION 202

Proponents: Brent Ursenbach, representing Salt Lake County Planning and Development Services (bursenbach@slco.org)

2018 International Mechanical Code

SECTION 202
GENERAL DEFINITIONS

Add new definition as follows:

INDIRECT EVAPORATIVE COOLING. The evaporative cooling process where water evaporates into a secondary air stream, removing heat from a primary air stream utilizing a heat exchanger.

DIRECT EVAPORATIVE COOLING. The evaporative cooling process where water evaporates directly into the air stream, reducing the air's dry-bulb temperature and raising its humidity level.

Reason: These two definitions are proposed the clarify the difference between direct and indirect evaporative cooling. Additionally, these definitions are proposed as part of this proponents proposal to IMC 602.2 and 603.5.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. These definitions simply identify the difference between two types of evaporative cooling.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Hearing Results

M2-18	**AS**

M8441/M4-18

Date Submitted 2/1/2021	**Section** 202	**Proponent** Mo Madani
Chapter 2	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

The proposed change revises the definitions of “flammability classification” and “toxicity classification” for consistency with ASHRAE 34.

Rationale

Reason: The current definitions of “flammability classification” and “toxicity classification” are improper since these contain mandatory code requirements. The definitions should only define the term, not contain requires with the use of the word “shall.” The definition of refrigerant safety classifications is incorrect because ASHRAE 34 was revised regarding the means of identifying the classification of refrigerants.

The classification or group of refrigerant is an alphabetical/numerical designation that is used to identify the flammability and toxicity of a given refrigerant. There were two new classifications added to ASHRAE 34, A2L and B2L. These designations were previously subclasses. Now they are a full class of refrigerant.

Revise as follows: Original mod

FLAMMABILITY CLASSIFICATION (REFRIGERANT). ~~Refrigerants shall be assigned to one of the three classes 1, 2 or 3 in accordance with ASHRAE 34. For Classes 2 and 3, the heat of combustion shall be calculated assuming that combustion products are in the gas phase and in their most stable state.~~ The alphabetical/numerical designation used to identify the flammability of refrigerants.

-

REFRIGERANT SAFETY CLASSIFICATIONS. ~~Groupings~~ The alphabetical/numerical designation that indicate both the toxicity and flammability ~~classes in accordance with Section 1103.1.~~
~~The~~ classification ~~group is made up of a letter (A or B) that indicates the toxicity class, followed by a number (1, 2 or 3) that indicates the flammability class. Refrigerant blends are similarly classified, based on the compositions at their worst cases of fractionation, as separately determined for toxicity and flammability. In some cases, the worst case of fractionation is the original formulation~~ of refrigerants.

TOXICITY ~~CLASSIFICATION~~ CLASSIFICATION (REFRIGERANT). ~~Refrigerants shall be classified for toxicity in one of two classes in accordance with ASHRAE 34:~~ An alphabetic designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with lower toxicity. Class B indicates a refrigerant with higher toxicity.

-

Public Comment 1: Approved with Public Comment 1

REFRIGERANT SAFETY ~~CLASSIFICATIONS~~ GROUP CLASSIFICATION. The alphabetical/numerical designation that ~~indicate~~ indicates both the toxicity and flammability ~~classification~~ classifications of refrigerants.

Toxicity. See Toxicity classification (Refrigerant).

Flammability. See Flammability classification (Refrigerant).

TOXICITY CLASSIFICATION (REFRIGERANT). An ~~alphabetic~~ alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with lower toxicity. Class B indicates a refrigerant with higher toxicity.

FLAMMABILITY CLASSIFICATION (REFRIGERANT). The alphabetical/numerical designation used to identify the flammability of refrigerants.

Indicates a refrigerant with no flame propagation.

Indicates a refrigerant with lower flammability and lower burning velocity.

Indicates a refrigerant with lower flammability.

Indicates a refrigerant with higher flammability.

Code Change No: M4-18

Original Proposal

Section(s): 202

Proponents: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Daikin US (JBENGINEER@aol.com)

2018 International Mechanical Code

Revise as follows:

FLAMMABILITY CLASSIFICATION (REFRIGERANT). ~~Refrigerants shall be assigned to one of the three classes-1, 2 or 3 in accordance with ASHRAE 34. For Classes 2 and 3, the heat of combustion shall be calculated assuming that combustion products are in the gas phase and in their most stable state.~~ The alphabetical/numerical designation used to identify the flammability of refrigerants.

REFRIGERANT SAFETY CLASSIFICATIONS. ~~Groupings~~ The alphabetical/numerical designation that indicate both the toxicity and flammability ~~classes in accordance with Section 1103.1.~~
~~The~~ classification ~~group is made up of a letter (A or B) that indicates the toxicity class, followed by a number (1, 2 or 3) that indicates the flammability class. Refrigerant blends are similarly classified, based on the compositions at their worst cases of fractionation, as separately determined for toxicity and flammability. In some cases, the worst case of fractionation is the original formulation~~ of refrigerants.

TOXICITY ~~CLASSIFICATION~~ CLASSIFICATION (REFRIGERANT). ~~Refrigerants shall be classified for toxicity in one of two classes in accordance with ASHRAE 34:~~ An alphabetic designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with lower toxicity. Class B indicates a refrigerant with higher toxicity.

Reason: The current definitions of "flammability classification" and "toxicity classification" are improper since these contain mandatory code requirements. The definitions should only define the term, not contain requires with the use of the word "shall." The definition of refrigerant safety classifications is incorrect because ASHRAE 34 was revised regarding the means of identifying the classification of refrigerants.

The classification or group of refrigerant is an alphabetical/numerical designation that is used to identify the flammability and toxicity of a given refrigerant. There were two new classifications added to ASHRAE 34, A2L and B2L. These designations were previously subclasses. Now they are a full class of refrigerant.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
These are definition changes.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 9-2)

Assembly Action: **None**

Public Comments

Public Comment 1:

Connor Barbaree, representing ASHRAE (cbarbaree@ashrae.org) requests As Modified by Public Comment

Modify as follows:

2018 International Mechanical Code

REFRIGERANT SAFETY ~~CLASSIFICATIONS~~ GROUP CLASSIFICATION. The alphabetical/numerical designation that ~~indicate~~ indicates both the toxicity and flammability ~~classification~~ classifications of refrigerants.

Toxicity. See Toxicity classification (Refrigerant).

Flammability. See Flammability classification (Refrigerant).

TOXICITY CLASSIFICATION (REFRIGERANT). An ~~alphabetic~~ alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with lower toxicity. Class B indicates a refrigerant with higher toxicity.

FLAMMABILITY CLASSIFICATION (REFRIGERANT). The alphabetical/numerical designation used to identify the flammability of refrigerants.

Indicates a refrigerant with no flame propagation.
Indicates a refrigerant with lower flammability and lower burning velocity.
Indicates a refrigerant with lower flammability.
Indicates a refrigerant with higher flammability.

Commenter's Reason: Per ASHRAE 34, the two refrigerant classifications for flammability and toxicity are combined into a safety group classification. These proposed modifications to M4-18 make the terminology consistent between ASHRAE 34 and the IMC content, for the classification definitions and also the proposed revisions of M88-18 for the headers of Table 1103.1.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction No technical changes so no impact on cost.

Final Action Results

M4-18	AMPC1

M8442/M5-18

Date Submitted 2/1/2021	**Section** 202	**Proponent** Mo Madani
Chapter 2	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

This change is simply editorial to provide clarity as this component of the "press-connect joint", if present, is often referred to as grip ring and, or bite ring by manufacturer's as well as installers.

Rationale

This change is simply editorial to provide clarity as this component of the "press-connect joint", if present, is often referred to as grip ring and, or bite ring by manufacturer's as well as installers. This change will eliminate any confusion that occurs when determining if a component referenced as a bite ring in technical specifications still meets the definition provided in the International codes. Grip and Bite rings serve the same purpose for permanent mechanical attachment to piping or tubing.

Revise as follows: Approved as Submitted

PRESS-CONNECT JOINT. A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion - resistant grip or bite ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.

Code Change No: M5-18

Original Proposal

Section(s): 202

Proponents: Mark Fasel, representing Viega LLC (mark.fasel@viega.us)

2018 International Mechanical Code

Revise as follows:

PRESS-CONNECT JOINT. A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion - resistant grip <u>or bite</u> ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.

Reason: This change is simply editorial to provide clarity as this component of the "press-connect joint", if present, is often referred to as grip ring and, or bite ring by manufacturer's as well as installers. This change will eliminate any confusion that occurs when determining if a component referenced as a bite ring in technical specifications still meets the definition provided in the International codes. Grip and Bite rings serve the same purpose for permanent mechanical attachment to piping or tubing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The proposal to revise the definition of press-connect joint clarifies that the design of a press-connect joint may incorporate a grip or bite ring. This clarification removes any confusion in terminology of the internal components by the manufacturer as they are sometimes labeled as bite ring or grip ring. This changes does not increase cost of construction, testing or listings, it is for clarification purposes only.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Hearing Results

M5-18	**AS**

M8444/M10-18

Date Submitted 2/1/2021	**Section** 307.1	**Proponent** Mo Madani
Chapter 3	**Affects HVHZ** Yes	**Attachments** Yes

TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Summary of Modification

Condensate drain systems from the same appliance need to be identified when terminating together at a remote location

Rationale

Condensate drain systems from the same appliance need to be identified when terminating together at a remote location when the piping is concealed or partially concealed and could have possibly changed orientation. Occupants and service personnel won't be able to tell by looking at the piping which system is discharging and can't identify if they have a problem.

Approved as modified (AM)

Original mod -

307.1 Fuel-burning appliances. Liquid combustion by-products of condensing appliances shall be collected and discharged to an approved plumbing fixture or disposal area in accordance with the manufacturer's installation instructions. Condensate piping shall be of approved corrosion-resistant material and shall not be smaller than the drain connection on the appliance. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one eighth unit vertical in 12 units horizontal (1-percent slope).

Add new text as follows:

307.1.2 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

307.2.3.3 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

Committee Action: Approved as Modified

Modify proposal as follows:

307.1.2 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

307.2.3.3 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

Code Change No: M10-18

Original Proposal

Section(s): 307.1, 307.1.2 (New), 307.2.3.3 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

307.1 Fuel-burning appliances. Liquid combustion by-products of condensing appliances shall be collected and discharged to an approved plumbing fixture or disposal area in accordance with the manufacturer's installation instructions. Condensate piping shall be of approved corrosion-resistant material and shall not be smaller than the drain connection on the appliance. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one eighth unit vertical in 12 units horizontal (1-percent slope).

Add new text as follows:

307.1.2 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

307.2.3.3 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

Reason: Condensate drain systems from the same appliance need to be identified when terminating together at a remote location when the piping is concealed or partially concealed and could have possibly changed orientation. Occupants and service personnel won't be able to tell by looking at the piping which system is discharging and can't identify if they have a problem.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Simply marking the lines in a way that the code official approves should not increase the cost.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

307.1.2 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

307.2.3.3 Identification. ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.

Committee Reason: Approval was based on the proponent's published reason statement. The modification more broadly addresses all concealed condensate piping. (Vote 8-3)

Assembly Action: **None**

Final Hearing Results

M10-18	AM

M8445/M11-18

Date Submitted 2/1/2021	**Section** 307.2.1.1	**Proponent** Mo Madani
Chapter 3	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

This proposal lists the appropriate fixtures for receiving condensate waste and prohibits discharge to inappropriate fixtures.

Rationale

Reason: The codes are silent on draining condensate to fixture connections (lav tailpiece and tub overflow) even though such practice is common in some locations. It is also common to find holes drilled into plumbing vents and stacks for the purpose of directly connecting a condensate drain. This practice is prohibited by code by strong implication, extended logic, but is not stated in plain text.
This proposal lists the appropriate fixtures for receiving condensate waste and prohibits discharge to inappropriate fixtures.
Condensate from one tenant space or dwelling must not discharge at a point in another tenant space or dwelling for reasons of limited access and potential damage to property.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as Submitted (AS)

Add new text as follows:

307.2.1.1 (IPC [M] 314.2.1.1) Condesate discharge. Condensate drains shall not directly connect to any plumbing drain, waste or vent pipe. Condensate drains shall not discharge into a plumbing fixture other than a floor sink, floor drain, trench drain, mop sink, hub drain, standpipe, utility sink or laundry sink. Condensate drain connections to a lavatory wye branch tailpiece or to a bathtub overflow pipe, shall not be considered as discharging to a plumbing fixture. Except where discharging to grade outdoors, the point of discharge of condensate drains shall be located within the same occupancy, tenant space or dwelling unit as the source of the condensate.

Code Change No: M11-18

Original Proposal

Section(s): 307.2.1.1 (IPC [M] 314.2.1.1) (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Add new text as follows:

307.2.1.1 (IPC [M] 314.2.1.1) Condesate discharge. Condensate drains shall not directly connect to any plumbing drain, waste or vent pipe. Condensate drains shall not discharge into a plumbing fixture other than a floor sink, floor drain, trench drain, mop sink, hub drain, standpipe, utility sink or laundry sink. Condensate drain connections to a lavatory wye branch tailpiece or to a bathtub overflow pipe, shall not be considered as discharging to a plumbing fixture. Except where discharging to grade outdoors, the point of discharge of condensate drains shall be located within the same occupancy, tenant space or dwelling unit as the source of the condensate.

Reason: The codes are silent on draining condensate to fixture connections (lav tailpiece and tub overflow) even though such practice is common in some locations. It is also common to find holes drilled into plumbing vents and stacks for the purpose of directly connecting a condensate drain. This practice is prohibited by code by strong implication, extended logic, but is not stated in plain text. This proposal lists the appropriate fixtures for receiving condensate waste and prohibits discharge to inappropriate fixtures. Condensate from one tenant space or dwelling must not discharge at a point in another tenant space or dwelling for reasons of limited access and potential damage to property.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. It is often difficult to find disposal locations in multiple-family dwelling buildings. (Vote 8-3)

Assembly Action: **None**

Final Hearing Results

M11-18 **AS**

M8446/M14-18

Date Submitted 2/1/2021	**Section** 307.2.2	**Proponent** Mo Madani
Chapter 3	**Affects HVHZ** Yes	**Attachments** Yes

TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Summary of Modification

List should be alphabetized. PERT and PVDF pipes and tubes already in the code could certainly be used in the application.

Rationale

List should be alphabetized. PERT and PVDF pipes and tubes already in the code could certainly be used in the application.

Approved as Submitted (AS)

Revise as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be ABS, cast iron~~,~~ ~~galvanized steel~~, copper ~~,~~ and copper alloy, CPVC, cross-linked polyethylene, galvanized steel, PE-RT, polyethylene, ~~ABS~~ polypropylene, ~~CPVC,~~ PVC ~~,~~ or ~~polypropylene~~ PVDF pipe or tubing. Components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than $^3/_4$-inch pipe size ~~internal diameter~~ and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

Code Change No: M14-18

Original Proposal

Section(s): 307.2.2 (IPC [M] 314.2.2)

Proponents: Michael Cudahy, representing Plastic Pipe and Fittings Association (mikec@cmservices.com)

2018 International Mechanical Code

Revise as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be ABS, cast iron~~, galvanized steel~~, copper ~~,~~ and copper alloy, CPVC, cross-linked polyethylene, galvanized steel, PE-RT, polyethylene, ~~ABS~~ polypropylene, ~~CPVC,~~ PVC ~~,~~ or ~~polypropylene~~ PVDF pipe or tubing. Components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than $^3/_4$-inch pipe size ~~internal diameter~~ and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

Reason: List should be alphabetized. PERT and PVDF pipes and tubes already in the code could certainly be used in the application.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
Adding other options for materials will not alter cost.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M14-18	**AS**

M8447/M17-18

Date Submitted	2/1/2021	**Section**	401.4	**Proponent**	Mo Madani
Chapter	4	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

501.3.1

Summary of Modification

The proposed code change allows for the installation of an approved factory-built intake/exhaust commination termination fitting.

Rationale

Intake/exhaust combination terminations are regularly installed with heating and energy recovery ventilators (H/ERVs) used for dwelling units. Their use reduces building penetrations, labor, and associated system costs. By reducing the number of penetrations, air leakage can also be reduced, resulting in space conditioning energy savings. Further, the durability of the structure can be improved through reducing entry pathways for bulk water.

Manufacturer tests conducted Natural Resources Canada (NRC) have demonstrated that use of intake/exhaust combination terminations results in minimum cross-contamination of airflows (i.e., not exceeding 4%; see NRC report A1-0077931). These results are aligned with ASHRAE 62.2 approval of such devices which limits cross-contamination to 10%, as verified by the manufacturer. If approved, this proposed modification is expected to result in more affordable and architecturally flexible terminations.

Approved as Submitted (AS)

Revise as follows:

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.

2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious 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 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.

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. <u>Separation is not required between intake air openings and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.</u>

4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the International Building Code for utilities and attendant equipment.

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: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings 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. <u>Separation is not required between intake air openings and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.</u>

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 specific systems, see the following sections:

   5.1. Clothes dryer exhaust, Section 504.4.

   5.2. Kitchen hoods and other kitchen exhaust equipment, Sections 506.3.13, 506.4 and 506.5.

   5.3. Dust, stock and refuse conveying systems, Section 511.2.

   5.4. Subslab soil exhaust systems, Section 512.4.

   5.5. Smoke control systems, Section 513.10.3.

   5.6. Refrigerant discharge, Section 1105.7.

   5.7. Machinery room discharge, Section 1105.6.1.

Code Change No: M17-18

Original Proposal

Section(s): 401.4, 501.3.1

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Revise as follows:

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.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious 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 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.
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. <u>Separation is not required between intake air openings and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.</u>
4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the International Building Code for utilities and attendant equipment.

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: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings 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. <u>Separation is not required between intake air openings and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.</u>

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 specific systems, see the following sections:
   5.1. Clothes dryer exhaust, Section 504.4.
   5.2. Kitchen hoods and other kitchen exhaust equipment, Sections 506.3.13, 506.4 and 506.5.
   5.3. Dust, stock and refuse conveying systems, Section 511.2.
   5.4. Subslab soil exhaust systems, Section 512.4.
   5.5. Smoke control systems, Section 513.10.3.
   5.6. Refrigerant discharge, Section 1105.7.
   5.7. Machinery room discharge, Section 1105.6.1.

Reason: Intake/exhaust combination terminations are regularly installed with heating and energy recovery ventilators (H/ERVs) used for dwelling units. Their use reduces building penetrations, labor, and associated system costs. By reducing the number of penetrations, air leakage can also be reduced, resulting in space conditioning energy savings. Further, the durability of the structure can be improved through reducing entry pathways for bulk water.

Manufacturer tests conducted Natural Resources Canada (NRC) have demonstrated that use of intake/exhaust combination terminations results in minimum cross-contamination of airflows (i.e., not exceeding 4%; see NRC report A1-007793[1]). These results are aligned with ASHRAE 62.2 approval of such devices which limits cross-contamination to 10%, as verified by the manufacturer. If approved, this proposed modification is expected to result in more affordable and architecturally flexible terminations.

Note: The IRC defines living space as, "space within a *dwelling unit* utilized for living, sleeping, eating, cooking, bathing, washing and sanitation purposes".

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Bibliography:

Ouazia, B. 2016. Evaluation of a dual hood performance in term of contaminant re-entrainment from exhaust to supply. A1-007793. National Research Council Canada. *For a copy of the report, please contact the proponent at the email address provided. Additional reports are available from the proponent upon request.*

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 9-2)

Assembly Action: **None**

Final Hearing Results

M17-18	**AS**

M8448/M18-18

Date Submitted 2/1/2021	**Section** 403.2.1	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

ACCA Manual SPS is proposed to be added to Chapter 15 Referenced Standards to support a proposed change to 403.2.1 adding SPS as a requirement for dehumidification design for swimming pools.

Rationale

Reason: ACCA Manual SPS, HVAC Design for Swimming Pools and Spas, is a manual specifically focused on the design of HVAC systems for indoor pools and spas. Manual SPS is an ANSI-recognized standard that was developed with input from original equipment manufacturers (OEM), mechanical contractors, and consulting engineers. Manual SPS addresses the unique dynamics for pools and spas including controlling dew point temperatures of space air as well as space temperature, sealing and insulating duct work, and dehumidification systems and indoor air quality.

ACCA Manual SPS is proposed to be added to Chapter 15 Referenced Standards to support a proposed change to 403.2.1 adding SPS as a requirement for dehumidification design for swimming pools.

Approved as Submitted (AS)

Revise as follows:

SECTION 403
MECHANICAL VENTILATION

403.2.1 Recirculation of air. The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. <u>The design and installation of dehumidification systems shall comply with ACCA Manual SPS, HVAC Design for Swimming Pools and Spas.</u>
3. Where mechanical exhaust is required by Note b in Table 403.3.1.1, recirculation of air from such spaces shall be prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. Where recirculation of air is prohibited, all air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.1.1.
4. Where mechanical exhaust is required by Note g in Table 403.3.1.1, mechanical exhaust is required and recirculation from such spaces is prohibited where more than 10 percent of the resulting supply air-stream consists of air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited.

Add new standard(s) as follows:

ACCA
<u>ANSI/ACCA 10 Manual SPS - 2010 RA 2017</u>: <u>HVAC Design for Swimming Pools and Spas</u>

Code Change No: M18-18

Original Proposal

Section(s): 403, 403.2.1, ACCA Chapter 15, 15 ACCA, ACCA Chapter 15 (New)

Proponents: David Bixby, Air Conditioning Contractors of America (ACCA), representing Air Conditioning Contractors of America (bixster1953@yahoo.com)

2018 International Mechanical Code

Revise as follows:

SECTION 403
MECHANICAL VENTILATION

403.2.1 Recirculation of air. The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. <u>The design and installation of dehumidification systems shall comply with ACCA Manual SPS, HVAC Design for Swimming Pools and Spas.</u>
3. Where mechanical exhaust is required by Note b in Table 403.3.1.1, recirculation of air from such spaces shall be prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. Where recirculation of air is prohibited, all air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.1.1.
4. Where mechanical exhaust is required by Note g in Table 403.3.1.1, mechanical exhaust is required and recirculation from such spaces is prohibited where more than 10 percent of the resulting supply air-stream consists of air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited.

Add new standard(s) as follows:

ACCA
<u>ANSI/ACCA 10 Manual SPS - 2010 RA 2017</u>: <u>HVAC Design for Swimming Pools and Spas</u>

Reason: ACCA Manual SPS, *HVAC Design for Swimming Pools and Spas*, is a manual specifically focused on the design of HVAC systems for indoor pools and spas. Manual SPS is an ANSI-recognized standard that was developed with input from original equipment manufacturers (OEM), mechanical contractors, and consulting engineers. Manual SPS addresses the unique dynamics for pools and spas including controlling dew point temperatures of space air as well as space temperature, sealing and insulating duct work, and dehumidification systems and indoor air quality.

ACCA Manual SPS is proposed to be added to Chapter 15 Referenced Standards to support a proposed change to 403.2.1 adding SPS as a requirement for dehumidification design for swimming pools.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.

Cost impacts for using Manual SPS will depend on the extra time involved in designing and coordinating an HVAC system for a swimming pool or spa project. System designers and installers must first scrutinize a project's plans and coordinate directly with the architect or builder to identify potential condensation, moisture control and air quality problems. These potential issues must be resolved between all parties before proceeding with the mechanical design. Once this has been addressed, the designer/installer will follow Manual SPS to install systems and OEM equipment used for controlling dew point temperature and dry-bulb temperature in an enclosed pool-spa space. .

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. This will prevent water damage. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M18-18 **AS**

M8451/M24-18

Date Submitted 2/3/2021
Chapter 4
Section 403.3.1.1
Affects HVHZ Yes
Proponent Mo Madani
Attachments Yes
TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review
Staff Classification Correlates Directly

Comments
General Comments **Yes**

Related Modifications

Table 403.3.1.1

Summary of Modification

The proposed change makes the code intended language consistent with ASHRAE 62.1-2016

Rationale

Reason: The proposed change makes the code intended language consistent with ASHRAE 62.1-2016.
As written the exception allows a larger percentage of recirculated exhaust air that may negatively affect IAQ.
A simple way to look at the current language is that the purpose of exhaust is to remove the air and its associated compounds from the building. Allowing 10% supply air to consist of exhausted air compromises the purpose of exhaust.

Comment Period History

M8451-G1

Proponent Joseph Belcher **Submitted** 6/30/2021 **Attachments** No

Comment:
The Florida Home Builders Association (FHBA) requests denial of this code change.

Approved as Submitted (AS)

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

Note - for the change see attached monograph

Code Change No: M24-18

Original Proposal

Section(s): TABLE 403.3.1.1

Proponents: Connor Barbaree, ASHRAE, representing ASHRAE (cbarbaree@ashrae.org)

2018 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, Rp CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT2 [a]	EXHAUST AIRFLOW RATE CFM/FT^{2} [a]
Correctional facilities				
Booking/waiting	50	7.5	0.06	—
Cells				
without plumbing fixtures	25	5	0.12	—
with plumbing fixtures[g]	25	5	0.12	1
Day room	30	5	0.06	—
Dining halls (see “Food and beverage service”)	—	—	—	—
Guard stations	15	5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	25	—	—
Storage, pick up	30	7.5	0.12	—
Education				
Art classroom[g]	20	10	0.18	0.7
Auditoriums	150	5	0.06	—
Classrooms (ages 5-8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Computer lab	25	10	0.12	—
Corridors (see “Public spaces”)	—	—	—	—

Day care (through age 4)	25	10	0.18	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Locker/dressing rooms[g]	—	—	—	0.25
Media center	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Music/theater/dance	35	10	0.06	—
Science laboratories[g]	25	10	0.18	1
Smoking lounges[b]	70	60	—	—
Sports locker rooms[g]	—	—	—	0.5
Wood/metal shops[g]	20	10	0.18	0.5
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
b				
Hotels, motels, resorts and dormitories				
Bathrooms/toilet—private[g]	—	—	—	25/50f
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas	20	5	0.06	—
Gambling casinos	120	7.5	0.18	—
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	5	0.06	—
Offices				
Conference rooms	50	5	0.06	—
Main entry lobbies	10	5	0.06	—
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Kitchens[b]	—	—	—	25/100f
Living areas[c]	Based on number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms[g]	—	—	—	20/50f
Public spaces				
Corridors	—	—	0.06	—

Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—
Shower room (per shower head)g	—	—	—	50/20f
Smoking lounges[b]	70	60	—	—
Toilet rooms — public[g]	—	—	—	50/70e
Retail stores, sales floors and showroom floors				
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Sales	15	7.5	0.12	—
Smoking lounges[b]	70	60	—	—
Storage rooms	—	—	0.12	—
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Nail salons[b, h]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2
Pet shops (animal areas)b	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Bowling alleys (seating areas)	40	10	0.12	—
Disco/dance floors	100	20	0.06	—
Game arcades	20	7.5	0.18	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Ice arenas without combustion engines	—	—	0.3	0.5
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Storage				

Repair garages, enclosed parking garages[b,d]	—	—	—	0.75
Warehouses	—	10	0.06	—
Theaters				
Auditoriums (see "Education")	—	—	—	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Computer (without printing)	4	5	0.06	—
Copy, printing rooms	4	5	0.06	0.5
Darkrooms	—	—	—	1
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) -32]/1.8, 1 square foot = 0.0929 m^2.

a. Based on net occupiable floor area.
b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).
c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
d. Ventilation systems in enclosed parking garages shall comply with Section 404.
e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
g. Mechanical exhaust is required and recirculation from such spaces is ~~prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces~~ prohibited. For occupancies other than science laboratories, where there is a wheel type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).
h. For nail salons, each manicure and pedicure station shall be provided with a source capture system capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

Reason: The proposed change makes the code intended language consistent with ASHRAE 62.1-2016.

As written the exception allows a larger percentage of recirculated exhaust air that may negatively affect IAQ.

A simple way to look at the current language is that the purpose of exhaust is to remove the air and its associated compounds from the building. Allowing 10% supply air to consist of exhausted air compromises the purpose of exhaust.

Bibliography:
ASHRAE 62.1 – 2016

Cost Impact: This proposal revises recirculation air requirements. However, this does not dictate system design to meet those requirements and therefore does not increase the cost of construction.

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Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M24-18	**AS**

M8455/M28-18

Date Submitted 2/3/2021	**Section** 403.3.2.5	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

See section 403.3.2.4 of the 2020 FMC.

Summary of Modification

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). Modification of Section 403.3.2.5, adding requirement of Fans to be listed and labeled.

Rationale

The 2018 IMC and IRC now require listing and labeling flows in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51 for exhaust equipment serving single dwelling units. This requirement should be expanded to all fans under the scope of the ANSI standard to ensure that flows are reported on an equivalent basis. AMCA and HVI maintain listings of products tested in accordance with the standard.

Approved as Submitted

403.3.2.5 Ventilating equipment. ~~Exhaust equipment serving single dwelling units~~ Fans providing exhaust or outdoor air shall be listed and labeled to provide the minimum required air flow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51

Code Change No: M28-18

Original Proposal

Section(s): 403.3.2.5

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Revise as follows:

403.3.2.5 Ventilating equipment. ~~Exhaust equipment serving single dwelling units~~ Fans providing exhaust or outdoor air shall be listed and labeled to provide the minimum required air flow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.

Reason: Industry experience and research have shown that "for advertised airflows that are not certified, the actual installed airflow can be a small fraction of the advertised value".[1] The 2018 IMC and IRC now require listing and labeling flows in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51 for exhaust equipment serving single dwelling units. This requirement should be expanded to all fans under the scope of the ANSI standard to ensure that flows are reported on an equivalent basis. AMCA and HVI maintain listings of products tested in accordance with the standard.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M28-18	**AS**

M8457/M29-18

Date Submitted 2/3/2021	**Section** 403.3.1.5	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes

TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Section 608.1 (New)

Summary of Modification

Deletes text of Section 403.3.1.5 without substitution. Adds new text concerning balancing to Section 608.1.

Rationale

The second sentence of this section is relocated from Chapter 4 where it is out-of-place and often overlooked. The first sentence simply applies the same requirement to air distribution systems as is currently required for ventilation systems, because the code was silent on balancing for such systems.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as Submitted

2018 International Mechanical Code

Delete without substitution:

~~**403.3.1.5 Balancing.** **The *ventilation* air distribution system shall be provided with means to adjust the system to achieve not less than the minimum ventilation airflow rate as required by Sections 403.3 and 403.3.1.2. Ventilation systems shall be balanced by an *approved* method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.3.1.2.**~~

Add new text as follows:

608.1 Balancing. Air distribution, ventilation and exhaust systems shall be provided with means to adjust the system to achieve the design airflow rates and shall be balanced by an approved method. Ventilation air distribution shall be balanced by an approved method and such balancing shall verify that the air distribution system is capable of supplying and exhausting the airflow rates required by Chapter 4.

Code Change No: M29-18

Original Proposal

Section(s): 403.3.1.5, 608.1 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Delete without substitution:

~~**403.3.1.5 Balancing.** The *ventilation* air distribution system shall be provided with means to adjust the system to achieve not less than the minimum ventilation airflow rate as required by Sections 403.3 and 403.3.1.2. Ventilation systems shall be balanced by an *approved* method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.3.1.2.~~

Add new text as follows:

608.1 Balancing. Air distribution, ventilation and exhaust systems shall be provided with means to adjust the system to achieve the design airflow rates and shall be balanced by an approved method. Ventilation air distribution shall be balanced by an approved method and such balancing shall verify that the air distribution system is capable of supplying and exhausting the airflow rates required by Chapter 4.

Reason: The second sentence of this section is relocated from Chapter 4 where it is out-of-place and often overlooked. The first sentence simply applies the same requirement to air distribution systems as is currently required for ventilation systems, because the code was silent on balancing for such systems.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M29-18	**AS**

M8461/M31-18

Date Submitted 2/3/2021	**Section** 407.1	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modification of text to Section 407.1, adding requirement to met standard NFPA 99.

Rationale

In addition to meeting the previous codes and standards referenced in this section in order to meet federal conditions of participation health care facilities must comply with the ventilation requirements listed in NFPA 99, Health Care Facilities Code (K521). This change will align the ventilation requirements for ambulatory care and Group I-2 facilities. This proposal is submitted by the ICC Committee on Healthcare (CHC).

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170~~.~~ and NFPA 99.

Code Change No: M31-18

Original Proposal

Section(s): 407.1

Proponents: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Mechanical Code

Revise as follows:

407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170~~.~~ and NFPA 99.

Reason: In addition to meeting the previous codes and standards referenced in this section in order to meet federal conditions of participation health care facilities must comply with the ventilation requirements listed in NFPA 99, Health Care Facilities Code (K521). This change will align the ventilation requirements for ambulatory care and Group I-2 facilities.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes.* Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/.

Cost Impact: The code change proposal will increase the cost of construction.
Costs will increase with this change because it will have additional ventilation requirements. However, it does not add cost to the healthcare industry because certified facilities already follow these requirements in the context of the federal standards.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M31-18	**AS**

M8467/M32-18

Date Submitted 2/4/2021	**Section** 403.3.2.1	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

This code change is already part of the 2020 FBC-M.

Summary of Modification

This code change credits the better performance of whole-building dilution ventilation systems that are distributed, mixed and balanced.

Rationale

This code change credits the better performance of whole-building dilution ventilation systems that are distributed, mixed and balanced.

Distributed, mixed and balanced ventilation is more effective at controlling indoor contaminants than typical exhaust ventilation that provides no distribution and mixing. Exhaust ventilation can draw in contaminants from garages, attics, crawlspaces, soil and wall assemblies in single-family detached and multi-family construction as well as from neighboring units in multi-family construction. Ventilation that does not provide distribution and mixing can allow high levels of contaminant concentration in various spaces within houses, especially rooms where people spend a lot of time with doors closed such as bedrooms. Distribution and mixing homogenizes interior conditions reducing potentially harmful high intermittent contaminant concentrations in interior spaces. There are multiple ways to get to 70% mixing; for example, a recirculation mode that ensures that a central space conditioning system fan operates at least 20 minutes per hour would often meet the criteria for 70% air recirculation.

This code change does not penalize exhaust ventilation, it justifiably credits balanced ventilation. Exhaust only ventilation should not be given the same indoor air quality credit since typical exhaust ventilation systems result in less air change than balanced ventilation systems and do not provide as effective control of contaminants.

Comment Period History

M8467-G1

Proponent Joseph Belcher **Submitted** 6/30/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change as it is already part of the FBC-M 7th Edition (2020).

Approved as Modified (AM)

Original mod

Add new definition as follows:

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate and the total mechanical supply airflow rate are substantially the same.

-

Revise as follows:

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

$$Q_{OA}=0.01A_{floor}+7.5(N_{br}+1) \quad \textbf{(Equation 4-9)}$$

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = conditioned floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

~~**Exception**~~ **Exceptions:**

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.

2. The minimum mechanical ventilation rate determined in accordance with Equation 4.9 shall be reduced by 25%, provided that all of the following conditions apply:

2.1. A ducted system supplies recirculated air directly to each bedroom and the largest common area.

2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through the ducted system, or for intermittently operated systems, an equivalent air recirculation is provided durring each four-hour period.

2.3. The whole-house ventilation system is a balanced ventilation system.

-

AMPC2

2018 International Mechanical Code

Add new definition as follows:

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10% the total mechanical supply airflow rate.

Revise as follows:

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

QOA=0.01Afloor+7.5(Nbr +1) **(Equation 4-9)**

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.

2. The minimum mechanical ventilation rate determined in accordance with Equation 4.9 shall be reduced by 30%, provided that both of the following conditions apply:

   2.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

      2.1.1 Living room

      2.1.2 Dining room

      2.1.3 Kitchen

   2.2. The whole-house ventilation system is a balanced ventilation system.

Code Change No: M32-18

Original Proposal

Section(s): 202

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Self (joe@buildingscience.com)

2018 International Mechanical Code
Add new definition as follows:

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate and the total mechanical supply airflow rate are substantially the same.

Revise as follows:

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

QOA=0.01Afloor+7.5(Nbr +1) **(Equation 4-9)**

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = conditioned floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

~~Exception~~ Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.
2. The minimum mechanical ventilation rate determined in accordance with Equation 4.9 shall be reduced by 25%, provided that all of the following conditions apply:
   - 2.1. A ducted system supplies recirculated air directly to each bedroom and the largest common area.
   - 2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through the ducted system, or for intermittently operated systems, an equivalent air recirculation is provided durring each four-hour period.
   - 2.3. The whole-house ventilation system is a balanced ventilation system.

Reason: This code change credits the better performance of whole-building dilution ventilation systems that are distributed, mixed and balanced.

Distributed, mixed and balanced ventilation is more effective at controlling indoor contaminants than typical exhaust ventilation that provides no distribution and mixing. Exhaust ventilation can draw in contaminants from garages, attics, crawlspaces, soil and wall assemblies in single-family detached and multi-family construction as well as from neighboring units in multi-family construction. Ventilation that does not provide distribution and mixing can allow high levels of contaminant concentration in various spaces within houses, especially rooms where people spend a lot of time with doors closed such as bedrooms. Distribution and mixing homogenizes interior conditions reducing potentially harmful high intermittent contaminant concentrations in interior spaces. There are multiple ways to get to 70% mixing; for example, a recirculation mode that ensures that a central space conditioning system fan operates at least 20 minutes per hour would often meet the criteria for 70% air recirculation.

This code change does not penalize exhaust ventilation, it justifiably credits balanced ventilation. Exhaust only ventilation should not be given the same indoor air quality credit since typical exhaust ventilation systems result in less air change than balanced ventilation systems and do not provide as effective control of contaminants.

Cost Impact: The code change proposal will decrease the cost of construction
The lower required ventilation rate recognizes that more effective ventilation requires less ventilation. This option could lower the cost of both construction and operation.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The word "substantially" in the definition is vague. The "largest common area" in exception 2, part 2.1 is not defined. (Vote 6-5)

Assembly Action: **None**

Public Comments

Public Comment 2:

Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing self (joe@buildingscience.com) requests As Modified by Public Comment

2018 International Mechanical Code

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate ~~and~~ is within 10% of the total mechanical supply airflow rate ~~are substantially the same.~~

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

QOA=0.01Afloor+7.5(Nbr +1) **(Equation 4-9)**

where:

Q_{OA} = outdoor airflow rate, cfm
A_{floor} = ~~conditioned~~ floor area, ft^2
N_{br} = number of bedrooms; not to be less than one

Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9..
2. The minimum mechanical ventilation rate determined in accordance with Equation 4.9 shall be reduced ~~by 25%~~ by 30%, provided that ~~all~~ both of the following conditions apply:
   2.1. A ducted system supplies ~~recirculated~~ ventilation air directly to each bedroom and ~~the largest common area.~~
   ~~2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through the ducted system, or for intermittently operated systems, an equivalent air recirculation is provided during each four-hour period~~ to one or more of the following rooms:
      2.1.1. Living room
      2.1.2. Dining room
      2.1.3. Kitchen.
   2.2.~~2.3.~~ The whole-house ventilation system is a balanced ventilation system.

Commenter's Reason: The words "substantially the same" are made less subjective by substituting "within 10%", as requested by the committee.

Following the verbal recommendation of the committee, the word "conditioned" was eliminated from "conditioned floor area".

The new 2.1 better describes "the largest common area" as "the living room, dining room or kitchen", meeting the committee request.

The text of exception 2.2 was deleted because the new 2.1 made it redundant and because the previous language of 2.2 was complicated.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction

This modification provides potentially reduced construction and operating costs to those who choose to use balanced ventilation.

Final Action Results

M32-18	**AMPC2**

M8472/M35-18

Date Submitted 2/4/2021	**Section** 502.20	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

502.20.1

Summary of Modification

Adds new section 502.20.1 "Operation", to provide criteria for exhaust system for manicure and pedicure stations

Rationale

Measures need to be taken that will prevent the exhaust system from being turned off after the inspection process is over. There are some 200,000 Nail Salons in the US employing some 375,000 people. Some of the chemicals employed in this process are acetone, isopropyl alcohol, Butyl acetate, dibutyl phthalate, ethyl acetate, ethyl methacrylate, formaldehyde, methacrylate, toluene, including nail dust and nail fungus. Many operators simply turn off the exhaust system simply because it’s too noisy there by putting the clients and employees at risk to these toxic fumes. Sometimes they are turned off to save on energy costs. When the fumes become overpowering the technicians end up opening doors to deal with the built up fumes even in the winter. This is an unacceptable situation that can easily be avoided. The same theory applies to kitchen exhaust systems. Requiring the system to operate at all times while occupied and operating will result in less fugitive vapors that can harm individuals.

Approved as Submitted

2018 International Mechanical Code

502.20 Manicure and pedicure stations. Manicure and pedicure stations shall be provided with an exhaust system in accordance with Table 403.3.1.1, Note h. Manicure tables and pedicure stations not provided with factory-installed exhaust inlets shall be provided with exhaust inlets located not more than 12 inches (305 mm) horizontally and vertically from the point of chemical application.

Add new text as follows:

502.20.1 Operation. The exhaust system for manicure and pedicure stations shall have controls that operate the system continuously when the space is occupied.

Code Change No: M35-18

Original Proposal

Section(s): 502.20, 502.20.1 (New)

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

502.20 Manicure and pedicure stations. Manicure and pedicure stations shall be provided with an exhaust system in accordance with Table 403.3.1.1, Note h. Manicure tables and pedicure stations not provided with factory-installed exhaust inlets shall be provided with exhaust inlets located not more than 12 inches (305 mm) horizontally and vertically from the point of chemical application.

Add new text as follows:

<u>**502.20.1 Operation.** The exhaust system for manicure and pedicure stations shall have controls that operate the system continuously when the space is occupied.</u>

Reason: Measures need to be taken that will prevent the exhaust system from being turned off after the inspection process is over. There are some 200,000 Nail Salons in the US employing some 375,000 people. Some of the chemicals employed in this process are acetone, isopropyl alcohol, Butyl acetate, dibutyl phthalate, ethyl acetate, ethyl methacrylate, formaldehyde, methacrylate, toluene, including nail dust and nail fungus. Many operators simply turn off the exhaust system simply because it's too noisy there by putting the clients and employees at risk to these toxic fumes. Sometimes they are turned off to save on energy costs. When the fumes become overpowering the technicians end up opening doors to deal with the built up fumes even in the winter. This is an unacceptable situation that can easily be avoided. The same theory applies to kitchen exhaust systems. Requiring the system to operate at all times while occupied and operating will result in less fugitive vapors that can harm individuals.
Cost Impact: The code change proposal will increase the cost of construction.
This could **possibly** increase cost in that it would take some coordination to interlock the power source with maybe the lights or some other automatic way of turning on the system.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposed text is needed to maintain a healthy environment. (Vote 7-4)

Assembly Action: **None**

Final Hearing Results

M35-18 **AS**

M8476/M43-18

Date Submitted 2/4/2021	**Section** 510.6.5	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modification of text of Section 510.6.5 "Makeup Air". This is an editorial cleanup with no new requirements.

Rationale

This is strictly an editorial cleanup with no new requirements. This section lacks the pertinent information that designers need to be aware of when using this Section

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

510.6.5 Makeup air. Makeup air from all sources shall be provided during operations at a rate approximately equal to the rate that air is exhausted by the hazardous exhaust system. Makeup air shall be provided by gravity or mechanical means or both. Mechanical makeup air systems shall be automatically controlled to start and operate simultaneously with the exhaust system. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air intakes shall be located in accordance with Section 401.4.

Code Change No: M43-18

Original Proposal

Section(s): 510.6.5

Proponents: Guy McMann, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

Revise as follows:

510.6.5 Makeup air. Makeup air <u>from all sources</u> shall be provided <u>during operations</u> at a rate approximately equal to the rate that air is exhausted by the hazardous <u>exhaust system. Makeup air shall be provided by gravity or mechanical means or both. Mechanical makeup air systems shall be automatically controlled to start and operate simultaneously with the exhaust system. The makeup air shall not reduce the effectiveness of the</u> exhaust system. Makeup air intakes shall be located in accordance with Section 401.4.

Reason: This is strictly an editorial cleanup with no new requirements. This section lacks the pertinent information that designers need to be aware of when using this Section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction .
This is strictly an editorial proposal.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-1)

Assembly Action: **None**

Final Hearing Results

M43-18	**AS**

M8478/M45-18

Date Submitted	2/4/2021	**Section**	507.1	**Proponent**	Mo Madani
Chapter	5	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

Adds exception to Section 507.1 "General", concerning Smoker ovens and integral exhaust systems.

Rationale

Not all smokers are created equal. Just because they are categorized as a Heavy-Duty Appliance shouldn't necessarily require them to be located under a type I hood when they have an integral exhaust system. Some of these units are equipped with evacuators and flue collectors which won't let any smoke out when the doors open. When the option to use standard exhaust systems that eliminate the possibility for smoke to escape into the kitchen, requiring them to be located under a hood isn't necessary. The blanket statement that all smoker ovens must be located under a hood regardless of the situation doesn't represent the technology that's available with these units and an exception is appropriate in these cases.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

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 or Type II hood shall be installed at or above appliances in accordance with Sections 507.2 and 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. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust equipment and makeup air system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.

2. Factory-built commercial cooking recirculating systems that are listed 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, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. 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).

3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.

4. Smoker ovens with integral exhaust systems provided that the appliance is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application and complies with Chapter 5

Code Change No: M45-18

Original Proposal

Section(s): 507.1

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

Revise as follows:

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 or Type II hood shall be installed at or above appliances in accordance with Sections 507.2 and 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. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust equipment and makeup air system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are listed 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, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. 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).
3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems provided that the appliance is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application and complies with Chapter 5

Reason: Not all smokers are created equal. Just because they are categorized as a Heavy-Duty Appliance shouldn't necessarily require them to be located under a type I hood when they have an integral exhaust system. Some of these units are equipped with evacuators and flue collectors which won't let any smoke out when the doors open. When the option to use standard exhaust systems that eliminate the possibility for smoke to escape into the kitchen, requiring them to be located under a hood isn't necessary. The blanket statement that all smoker ovens must be located under a hood regardless of the situation doesn't represent the technology that's available with these units and an exception is appropriate in these cases.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This is a cost neutral proposal.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: A hood for extra heavy-duty appliances is not necessary for smokers. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M45-18	**AS**

M8479/M46-18

Date Submitted	2/4/2021	**Section**	507.1	**Proponent**	Mo Madani
Chapter	5	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

Addition of exception to Section 507.1 "General", providing an exception for smoker ovens and integral exhaust systems.

Rationale

Not all smokers are created equal. Just because they are categorized as a Heavy-Duty Appliance shouldn't necessarily require them to be located under a type I hood when they have an integral exhaust system. Some of these units are equipped with evacuators and flue collectors which won't let any smoke out when the doors open. When the option to use standard exhaust systems that eliminate the possibility for smoke to escape into the kitchen, requiring them to be located under a hood isn't necessary. The blanket statement that all smoker ovens must be located under a hood regardless of the situation doesn't represent the technology that's available with these units and an exception is appropriate in these cases

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

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 or Type II hood shall be installed at or above appliances in accordance with Sections 507.2 and 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. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust equipment and makeup air system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.

2. Factory-built commercial cooking recirculating systems that are listed 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, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. 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).

3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.

4. Smoker ovens with integral exhaust systems provided that the appliance is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application and complies with Chapter 5

Code Change No: M46-18

Original Proposal

Section(s): 507.1

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

Revise as follows:

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 or Type II hood shall be installed at or above appliances in accordance with Sections 507.2 and 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. Where a Type I hood is installed, the installation of the entire system, including the hood, ducts, exhaust equipment and makeup air system shall comply with the requirements of Sections 506, 507, 508 and 509.

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5.
2. Factory-built commercial cooking recirculating systems that are listed 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, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5. 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).
3. Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96, a hood shall not be required at or above them.
4. Smoker ovens with integral exhaust systems provided that the appliance is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application and complies with Chapter 5

Reason: Not all smokers are created equal. Just because they are categorized as a Heavy-Duty Appliance shouldn't necessarily require them to be located under a type I hood when they have an integral exhaust system. Some of these units are equipped with evacuators and flue collectors which won't let any smoke out when the doors open. When the option to use standard exhaust systems that eliminate the possibility for smoke to escape into the kitchen, requiring them to be located under a hood isn't necessary. The blanket statement that all smoker ovens must be located under a hood regardless of the situation doesn't represent the technology that's available with these units and an exception is appropriate in these cases.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This is a cost neutral proposal.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: A hood for extra heavy-duty appliances is not necessary for smokers. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M46-18	**AS**

M8484/M47-18

Date Submitted	2/4/2021	**Section**	506.3.9	**Proponent**	Mo Madani
Chapter	5	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modification of text of Section 506.3.9 "Grease duct horizontal cleanouts", adds need for cleanouts to be located within 3 feet of horizontal discharge fans.

Rationale

There are times when It's not practical to expect maintenance personnel to open a hinged fan on the side of a building especially if it's higher than 10. Some fans are very large and could be unsafe to attempt to open it. A much safer and simpler solution is to install a clean-out within a close distance so as to clean and service the fan from the inside.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

506.3.9 Grease duct horizontal cleanouts. Cleanouts serving horizontal sections of grease ducts shall:

1. Be spaced not more than 20 feet (6096 mm) apart.
2. Be located not more than 10 feet (3048 mm) from changes in direction that are greater than 45 degrees (0.79 rad).
3. Be located on the bottom only where other locations are not available and shall be provided with internal damming of the opening such that grease will flow past the opening without pooling. Bottom cleanouts and openings shall be approved for the application and installed liquid-tight.
4. Not be closer than 1 inch (25 mm) from the edges of the duct.
5. Have opening dimensions of not less than 12 inches by 12 inches (305 mm by 305 mm). Where such dimensions preclude installation, the opening shall be not less than 12 inches (305 mm) on one side and shall be large enough to provide access for cleaning and maintenance.
6. ~~Shall be~~ Be located at grease reservoirs.
7. Be located within 3 feet of horizontal discharge fans.

Code Change No: M47-18

Original Proposal

Section(s): 506.3.9

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

Revise as follows:

506.3.9 Grease duct horizontal cleanouts. Cleanouts serving horizontal sections of grease ducts shall:

1. Be spaced not more than 20 feet (6096 mm) apart.
2. Be located not more than 10 feet (3048 mm) from changes in direction that are greater than 45 degrees (0.79 rad).
3. Be located on the bottom only where other locations are not available and shall be provided with internal damming of the opening such that grease will flow past the opening without pooling. Bottom cleanouts and openings shall be approved for the application and installed liquid-tight.
4. Not be closer than 1 inch (25 mm) from the edges of the duct.
5. Have opening dimensions of not less than 12 inches by 12 inches (305 mm by 305 mm). Where such dimensions preclude installation, the opening shall be not less than 12 inches (305 mm) on one side and shall be large enough to provide access for cleaning and maintenance.
6. ~~Shall be~~ Be located at grease reservoirs.
7. Be located within 3 feet of horizontal discharge fans.

Reason: There are times when It's not practical to expect maintenance personnel to open a hinged fan on the side of a building especially if it's higher than 10. Some fans are very large and could be unsafe to attempt to open it. A much safer and simpler solution is to install a clean-out within a close distance so as to clean and service the fan from the inside.

Cost Impact: The code change proposal will increase the cost of construction.
The increase in cost would amount to an additional cleanout installed near the fan discharge.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-1)

Assembly Action: **None**

Final Hearing Results

M47-18 **AS**

M8485/M52-18

Date Submitted 2/4/2021	**Section** 506.5.2	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

UL Chapter 15, 15 UL, UL Chapter 15 (New)

Summary of Modification

Modification of text of Section 506.4.2 "Pollution-control units". This proposal further refines the requirements for pollution control units. Adds standard UL 8782-17.

Rationale

This proposal further refines the requirements for pollution control units, as follows:

Item 1: UL 1978, the Standard for Grease Ducts, does not contain all the requirements necessary for listing PCUs. UL developed the UL 8782, "Outline of Investigation for Pollution Control Units for Commercial Cooking", in collaboration with code officials, manufacturers, and installers. UL 8782 contains both construction and performance requirements to address various issues not covered by UL 1978, including:

- Air filtration components – PCUs use various methods of filtration, such as electrostatic precipitators or grease filters.
- Electrical requirements – PCUs are also electrical equipment, for purposes of providing both power and control.

Item 3: Clarifies the requirements for mounting and supporting PCUs. These are the same requirements that are used for supporting grease ducts (IMC Section 506.3.3).

Item 4: Requirements used to evaluate the effectiveness of the combination of a PCU and an enclosure as a fire rated enclosure system and through penetration firestop system, as well as the enclosure's effect on the PCU are contained in UL 2221 and ASTM E2336.

Item 5: UL 8782 contains the same performance criteria as UL 1978 to establish the minimum clearances to combustible material. UL 8782 requires the PCUs to be marked with the minimum clearances.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with ~~the manufacturer's installation instructions and~~ all of the following:

1. Pollution-control units shall be listed and labeled in accordance with UL ~~1978~~ 8782.
2. Fans serving pollution-control units shall be listed and labeled in accordance with UL 762.
3. ~~Pollution~~Bracing and supports for pollution-control units shall be ~~mounted and secured in accordance with the manufacturer's installation instructions and~~ 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 ~~located in a room or space~~ 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. ~~A clearance of not less than 18 inches (457 mm)~~ Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
6. 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.
7. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.
8. 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.
9. Pollution-control units shall be provided with a factory-installed fire suppression system.
10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.
11. 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.
12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.
13. Duct connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the unit's inlet and outlet openings.
14. Extra-heavy-duty appliance exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels.
15. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

Add new standard(s) as follows:

UL
8782-17: Outline of Investigation for Pollution Control Units for Commercial Cooking

Code Change No: M52-18

Original Proposal

Section(s): 506.5.2, UL Chapter 15, 15 UL, UL Chapter 15 (New)

Proponents: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Mechanical Code

Revise as follows:

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with ~~the manufacturer's installation instructions and~~ all of the following:

1. Pollution-control units shall be listed and labeled in accordance with UL ~~1978~~ 8782.
2. Fans serving pollution-control units shall be listed and labeled in accordance with UL 762.
3. ~~Pollution~~Bracing and supports for pollution-control units shall be ~~mounted and secured in accordance with the manufacturer's installation instructions and~~ 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 ~~located in a room or space~~ 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. ~~A clearance of not less than 18 inches (457 mm)~~ Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
6. 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.
7. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.
8. 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.
9. Pollution-control units shall be provided with a factory-installed fire suppression system.
10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.
11. 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.
12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.
13. Duct connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the unit's inlet and outlet openings.
14. Extra-heavy-duty appliance exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels.
15. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

Add new standard(s) as follows:

UL
8782-17: Outline of Investigation for Pollution Control Units for Commercial Cooking

Reason: This proposal further refines the requirements for pollution control units, as follows:

Item 1: UL 1978, the Standard for Grease Ducts, does not contain all the requirements necessary for listing PCUs. UL developed the UL 8782, "Outline of Investigation for Pollution Control Units for Commercial Cooking", in collaboration with code officials, manufacturers, and installers. UL 8782 contains both construction and performance requirements to address various issues not covered by UL 1978, including:

- Air filtration components – PCUs use various methods of filtration, such as electrostatic precipitators or grease filters.
- Electrical requirements – PCUs are also electrical equipment, for purposes of providing both power and control.

Item 3: Clarifies the requirements for mounting and supporting PCUs. These are the same requirements that are used for supporting grease ducts (IMC Section 506.3.3).

Item 4: Requirements used to evaluate the effectiveness of the combination of a PCU and an enclosure as a fire rated enclosure system and through penetration firestop system, as well as the enclosure's effect on the PCU are contained in UL 2221 and ASTM E2336.

Item 5: UL 8782 contains the same performance criteria as UL 1978 to establish the minimum clearances to combustible material. UL 8782 requires the PCUs to be marked with the minimum clearances.

Cost Impact: No cost impact. Manufacturers are already testing and certifying their PCUs in accordance with UL 8782. This proposal provides clarity on the requirements for PCUs, as well as additional flexibility.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 8-3)

Assembly Action: **None**

Final Hearing Results

M52-18 **AS**

M8486/M53-18 Part I

Date Submitted 2/4/2021	**Section** 504.6	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Adds a new Section 504.6 "Booster fans prohibited". This change is being proposed for clarity to distinguish between old style booster fans and dryer exhaust duct power ventilators (DEDPV)

Rationale

This change is being proposed for clarity to distinguish between old style booster fans and dryer exhaust duct power ventilators (DEDPV). UL 2158 (electric dryer standard) and ANSI Z21.5.1/CSA 7.1 (gas dryer standard) prohibit domestic dryers from connecting to dryer exhaust systems having booster fans. The warning required to be included in the installation instructions by both standards reads, “WARNING: Risk of Fire. Do not install a booster fan in the exhaust duct.”

Booster fans were a class of ventilators that were installed before the introduction of dryer exhaust duct power ventilators or DEDPVs. DEDPV are regulated by UL 705, whereas old style booster fans where not specifically addressed in any UL standard. DEDPVs are not impacted by this change since Section 504.5 in the Mechanical Code and Section M1502.4.4 of the Residential Code permit the installation and use of DEDPVs.

Approved as Submitted

2018 International Mechanical Code

Add new text as follows:

504.6 Booster fans prohibited. Domestic booster fans shall not be installed in dryer exhaust systems.

Code Change No: M53-18 Part I

Original Proposal

Section(s): 504.6 (New)

Proponents: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Systemair (JBEngineer@aol.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IMC COMMITTEE AND PART II WILL BE HEARD BY THE IRC M/P COMMITTEE. PLEASE SEE THE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Mechanical Code

Add new text as follows:

504.6 Booster fans prohibited. Domestic booster fans shall not be installed in dryer exhaust systems.

Reason: This change is being proposed for clarity to distinguish between old style booster fans and dryer exhaust duct power ventilators (DEDPV). UL 2158 (electric dryer standard) and ANSI Z21.5.1/CSA 7.1 (gas dryer standard) prohibit domestic dryers from connecting to dryer exhaust systems having booster fans. The warning required to be included in the installation instructions by both standards reads, "*WARNING: Risk of Fire. Do not install a booster fan in the exhaust duct.*"

Booster fans were a class of ventilators that were installed before the introduction of dryer exhaust duct power ventilators or DEDPVs. DEDPV are regulated by UL 705, whereas old style booster fans where not specifically addressed in any UL standard. DEDPVs are not impacted by this change since Section 504.5 in the Mechanical Code and Section M1502.4.4 of the Residential Code permit the installation and use of DEDPVs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The change only clarifies current code requirements.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M53-18 Part I	**AS**

M8491/M54-18

Date Submitted 2/4/2021	**Section** 506.3.7	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Adds exception to Section 506.3.7 "Prevention of grease accumulation in grease ducts". An exception for Factory-built grease ducts.

Rationale

: To be in harmony with other code bodies across the country as NFPA and UMC both have this language incorporated. Factory-built manufacturers have been installing to a lesser slope for many years according to their respective testing agency listings.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

506.3.7 Prevention of grease accumulation in grease ducts. Duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward a grease reservoir designed and installed in accordance with Section 506.3.7.1. Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall be not less than one unit vertical in 12 units horizontal (8.3-percent slope).

> **Exception:** Factory-built grease ducts shall be installed at a slope that is in accordance with the listing and manufacturer's installation instructions.

Code Change No: M54-18

Original Proposal

Section(s): 506.3.7

Proponents: Keith Page, Hart & Cooley / Selkirk, representing Hart & Cooley / Selkirk - Engineering Manager

2018 International Mechanical Code

Revise as follows:

506.3.7 Prevention of grease accumulation in grease ducts. Duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward a grease reservoir designed and installed in accordance with Section 506.3.7.1. Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall be not less than one unit vertical in 12 units horizontal (8.3-percent slope).

> **Exception:** Factory-built grease ducts shall be installed at a slope that is in accordance with the listing and manufacturer's installation instructions.

Reason: To be in harmony with other code bodies across the country as NFPA and UMC both have this language incorporated. Factory-built manufacturers have been installing to a lesser slope for many years according to their respective testing agency listings.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The installation of factory-built grease duct has been installed w/ lesser slope by means of following our UL listed instructions and therefore this code editorial update won't change the current field installation process. In fact, in some instances where there is a very long horizontal run (i.e. exceeding 75'), the lower slope requirement of a UL listed duct mitigates the often used see-saw design of rectangular field fabricated ducts that typically require drains at the bottom of the see-saw, thus requiring maintenance

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M54-18	**AS**

M8492/M58-18

Date Submitted	2/4/2021	**Section**	514.2	**Proponent**	Mo Madani
Chapter	5	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modifies text of Section 514.2 "Prohibited applications". Revision relaxes the prohibition on ERV's for Type II hoods

Rationale

: This revision simply relaxes the prohibition on ERV's for Type II hoods. Type II hoods discharge warm moist air and ERV's can take advantage of the rich source of latent and sensible heat energy. Type II hood exhaust does not contain grease vapors and cooking particulates that could create a hazard with ERV heat exchangers.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

1. Hazardous exhaust systems covered in Section 510.
2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust.
3. Smoke control systems covered in Section 513.
4. Commercial kitchen exhaust systems serving Type I ~~or Type II~~ hoods.
5. Clothes dryer exhaust systems covered in Section 504.

Exception: The application of ERV equipment that recovers sensible heat only utilizing coil-type heat exchangers shall not be limited by this section

Code Change No: M58-18

Original Proposal

Section(s): 514.2

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Revise as follows:

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

1. Hazardous exhaust systems covered in Section 510.
2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust.
3. Smoke control systems covered in Section 513.
4. Commercial kitchen exhaust systems serving Type I ~~or Type II~~ hoods.
5. Clothes dryer exhaust systems covered in Section 504.

Exception: The application of ERV equipment that recovers sensible heat only utilizing coil-type heat exchangers shall not be limited by this section.

Reason: This revision simply relaxes the prohibition on ERV's for Type II hoods. Type II hoods discharge warm moist air and ERV's can take advantage of the rich source of latent and sensible heat energy. Type II hood exhaust does not contain grease vapors and cooking particulates that could create a hazard with ERV heat exchangers.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 7-4)

Assembly Action: **None**

Final Hearing Results

M58-18 **AS**

M8493/M59-18

Date Submitted 2/4/2021	**Section** 504.4.1	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Adds new Section 504.4.1 "Termination location". Current code does not address clearances between building openings and clothes dryer exhaust terminals. This proposal coordinates with the requirement in the IRC.

Rationale

Current code does not address clearances between building openings and clothes dryer exhaust terminals. This proposal coordinates with the requirement in the IRC.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as Submitted

2018 International Mechanical Code

Add new text as follows:

504.4.1 Termination location. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. Where the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings including openings in ventilated soffits.

Code Change No: M59-18

Original Proposal

Section(s): 504.4.1 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Add new text as follows:

504.4.1 Termination location. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. Where the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings including openings in ventilated soffits.

Reason: Current code does not address clearances between building openings and clothes dryer exhaust terminals. This proposal coordinates with the requirement in the IRC.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 8-3)

Assembly Action: **None**

Final Hearing Results

M59-18	**AS**

M8494/M62-18

Date Submitted 2/4/2021	**Section** 511.1	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

511.1.1, 511.1.5.

Summary of Modification

Section 511.1 has been modified to add "and the International Fire Code" in the top scoping section. Section 511.1.5 is modified to rename it 'Explosion Control". Requirements to be applied with linkage to the IFC as the correct document for installing explosion control

Rationale

This proposal is follow up work correlating the IBC, IMC and IFC provisions with the work done on Chapter 22 Combustible Dust and Chapter 37 Combustible Fibers in the IFC along with Section 426 of the IBC. Last cycle IBC Section 426 and Chapter 22 Combustible Dust-Producing Operations were updated to apply the new NFPA 652 Standard on the Fundamentals of Combustible Dust as the lead document when identifying and managing combustible dust hazards.

In this proposal Section 511.1 has been modified to add "and the International Fire Code" in the top scoping section. In looking at 511.1 and the following sections the IFC would only apply for the exceptions to Section 511.1.1 when it should apply generally regardless of whether or not a system is located inside or on th exterior of a facility.

Section 511.1.5 is modified to rename it 'Explosion Control" which is the correct terminology, the necessary protection features are much more than just "relief vents". "Explosion control" has been inserted as the lead requirement to be applied with linkage to the IFC as the correct document for installing explosion control. In addition language has been added "that produce combustible dusts in such a manner that the concentration and conditions create a fire or explosion hazard based on a Dust Hazard Analysis prepared" which is a phrase being applied and updated in other areas of the codes for the required assessment of the potential hazard. Finally, the pointer to Section 2203.2 of the IFC leads the designer and the code official to the linkage with NFPA 652.

Approved as Modified by Public Comment 1

2018 International Mechanical Code

SECTION 511
DUST, STOCK AND REFUSE CONVEYING SYSTEMS

Revise as follows:

511.1 Dust, stock and refuse conveying systems. Dust, stock and refuse conveying systems shall comply with the provisions of Section 510 and Sections 511.1.1 through 511.2 and the International Fire Code.

511.1.1 Collectors and separators. Collectors and separators involving such systems as centrifugal separators, bag filter systems and similar devices, and associated supports shall be constructed of noncombustible materials and shall be located on the exterior of the building or structure. A collector or separator shall not be located nearer than 10 feet (3048 mm) to combustible construction or to an unprotected wall or floor opening, unless the collector is provided with a metal vent pipe that extends above the highest part of any roof with a distance of 30 feet (9144 mm).

Exceptions:

1. Collectors such as “Point of Use” collectors, close extraction weld fume collectors, spray finishing booths, stationary grinding tables, sanding booths, and integrated or machine-mounted collectors shall be permitted to be installed indoors provided that the installation is in accordance with the International Fire Code and NFPA 70.
2. Collectors in independent exhaust systems handling combustible dusts shall be permitted to be installed indoors provided that such collectors are installed in compliance with the International Fire Code and NFPA 70.

511.1.5 Explosion ~~relief vents~~ control. ~~A safety or explosion relief vent~~ Explosion control shall be provided in accordance with the requirements of the International Fire Code on all systems that convey combustible dust or combustible refuse or stock ~~of an explosive nature,~~ that produces combustible dusts in such a manner that the concentration and conditions could create a fire or explosion hazard. Determination of concentrations or conditions that are deemed to not create a fire or explosion hazard shall be based on a Dust Hazard Analysis prepared in accordance with ~~the requirements~~ Section 2203.2 of the International ~~Building~~ Fire Code.

Public Comment 1:

Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

2018 International Mechanical Code

511.1.5 Explosion control. Explosion control shall be provided in accordance with the requirements of the International Fire Code on all systems that convey combustible dust or combustible refuse or stock that ~~produce~~ produces combustible dusts in such a manner that the concentration and conditions could create a fire or explosion hazard. Determination of concentrations or conditions that are deemed to not create a fire or explosion hazard shall be based on a Dust Hazard Analysis prepared in accordance with Section 2203.2 of the International Fire Code.

Code Change No: M62-18

Original Proposal

Section(s): SECTION 511, 511.1, 511.1.1, 511.1.5

Proponents: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

2018 International Mechanical Code

SECTION 511
DUST, STOCK AND REFUSE CONVEYING SYSTEMS

Revise as follows:

511.1 Dust, stock and refuse conveying systems. Dust, stock and refuse conveying systems shall comply with the provisions of Section 510 and Sections 511.1.1 through 511.2 and the International Fire Code.

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Exceptions:

1. Collectors such as “Point of Use” collectors, close extraction weld fume collectors, spray finishing booths, stationary grinding tables, sanding booths, and integrated or machine-mounted collectors shall be permitted to be installed indoors provided that the installation is in accordance with the International Fire Code and NFPA 70.
2. Collectors in independent exhaust systems handling combustible dusts shall be permitted to be installed indoors provided that such collectors are installed in compliance with the International Fire Code and NFPA 70.

511.1.5 Explosion ~~relief vents~~ control. ~~A safety or explosion relief vent~~ Explosion control shall be provided in accordance with the requirements of the International Fire Code on all systems that convey combustible refuse or stock ~~of an explosive nature,~~ that produce combustible dusts in such a manner that the concentration and conditions create a fire or explosion hazard based on a Dust Hazard Analysis prepared in accordance with ~~the requirements~~ Section 2203.2 of the International ~~Building~~ Fire Code.

Reason: This proposal is follow up work correlating the IBC, IMC and IFC provisions with the work done on Chapter 22 Combustible Dust and Chapter 37 Combustible Fibers in the IFC along with Section 426 of the IBC. Last cycle IBC Section 426 and Chapter 22 Combustible Dust-Producing Operations were updated to apply the new NFPA 652 Standard on the Fundamentals of Combustible Dust as the lead document when identifying and managing combustible dust hazards.

In this proposal Section 511.1 has been modified to add "and the International Fire Code" in the top scoping section. In looking at 511.1 and the following sections the IFC would only apply for the exceptions to Section 511.1.1 when it should apply generally regardless of whether or not a system is located inside or on th exterior of a facility.

Section 511.1.5 is modified to rename it 'Explosion Control" which is the correct terminology, the necessary protection features are much more than just "relief vents". "Explosion control" has been inserted as the lead requirement to be applied with linkage to the IFC as the correct document for installing explosion control. In addition language has been added "that produce combustible dusts in such a manner that the concentration and conditions create a fire or explosion hazard based on a Dust Hazard Analysis prepared" which is a phrase being applied and updated in other areas of the codes for the required assessment of the potential hazard. Finally, the pointer to Section 2203.2 of the IFC leads the designer and the code official to the linkage with NFPA 652.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Updating the language to correlate with other changes in the codes is not expected to increase or decrease the cost of construction, however, increasing clarification in code application provides an opportunity to reduce costs.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Public Comments

Public Comment 1:

Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

2018 International Mechanical Code

511.1.5 Explosion control. Explosion control shall be provided in accordance with the requirements of the International Fire Code on all systems that convey combustible dust or combustible refuse or stock that ~~produce~~ produces combustible dusts in such a manner that the concentration and conditions could create a fire or explosion hazard. Determination of concentrations or conditions that are deemed to not create a fire or explosion hazard shall be based on a Dust Hazard Analysis prepared in accordance with Section 2203.2 of the International Fire Code.

Commenter's Reason: The revision clarifies that ducts conveying combustible dust, not just refuse or stock that produces combustible dust, require explosion control consideration. In addition, the revision defaults to the need for explosion control in all cases unless a dust hazard analysis demonstrates otherwise, recognizing that some may choose to just provide explosion control or venting, as opposed to preparing a dust hazard analysis.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The change is intended to clarify and enhance application of the original proposal.

Final Action Results

M62-18	**AMPC1**

M9829/F276-18

Date Submitted	3/23/2021	**Section**	502.9.5	**Proponent**	Mo Madani
Chapter	5	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

IMC: [F] 502.9.5

Summary of Modification

This proposal adopts UL 1389 as the standard used to list extraction equipment, and reformats section 3904 to clarify that the technical report and registered design professional site inspection are only required for extraction systems that are not listed.

Rationale

The code currently allows extraction equipment to be either listed or approved. If the equipment is not listed, approval is based on a registered design professional preparing a technical report on the equipment, followed up by a site inspection.

UL 1389 was developed to investigate plant extraction equipment that utilizes flammable solvents. This proposal adopts UL 1389 as the standard used to list extraction equipment, and reformats section 3904 to clarify that the technical report and registered design professional site inspection are only required for extraction systems that are not listed.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

~~[F]~~502.9.5 Flammable and combustible liquids. **Exhaust ventilation systems shall be provided as required by Sections 502.9.5.1 through 502.9.5.5 for the storage, use, dispensing, mixing and handling of flammable and combustible liquids. Unless otherwise specified, this section shall apply to any quantity of flammable and combustible liquids.**

~~Exception~~ Exceptions:

1. This section shall not apply to flammable and combustible liquids that are exempt from the International Fire Code.
2. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the International Fire Code.

-

Code Change No: F276-18

Original Proposal

Section(s): IBC: 307.1.1, 311.2, 311.3;
IFC: 903.2.4.2 (New) (IBC:[F]903.2.4.2), 903.2.9.3 (New) (IBC:[F]903.2.9.3), Chapter 40 (New), 5001.1, 5701.2
IMC: [F] 502.9.5

Proponents: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Ed Kulik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Fire Code

Revise as follows:

[F]307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the International Fire Code.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the International Fire Code.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary storage battery systems installed in accordance with the International Fire Code.
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol product storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the International Fire Code.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the International Fire Code.
15. Stationary fuel cell power systems installed in accordance with the International Fire Code.
16. Capacitor energy storage systems in accordance with the International Fire Code.
17. Group B higher education laboratory occupancies complying with Section 428 and Chapter 38 of the International Fire Code
18. <u>Distilling or brewing of beverages conforming to the requirements of the International Fire Code.</u>

19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the International Fire Code.

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosol products, Levels 2 and 3
Aircraft hangar (storage and repair)
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
Beverages: over 16-percent alcohol content
Books and paper in rolls or packs
Boots and shoes
Buttons, including cloth covered, pearl or bone
Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage
Dry boat storage (indoor)
Furniture
Furs
Glues, mucilage, pastes and size
Grains
Horns and combs, other than celluloid
Leather
Linoleum
Lumber
Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.8)
Photo engravings
Resilient flooring
Self-service storage facility (mini-storage)
Silks
Soaps
Sugar
Tires, bulk storage of
Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

Asbestos
Beverages up to and including 16-percent alcohol ~~in metal, glass or ceramic containers~~
Cement in bags
Chalk and crayons
Dairy products in nonwaxed coated paper containers
Dry cell batteries
Electrical coils
Electrical motors
Empty cans

Food products
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glass bottles, empty or filled with noncombustible liquids
Gypsum board
Inert pigments
Ivory
Meats
Metal cabinets
Metal desks with plastic tops and *trim*
Metal parts
Metals
Mirrors
Oil-filled and other types of distribution transformers
Parking garages, open or enclosed
Porcelain and pottery
Stoves
Talc and soapstones
Washers and dryers

2018 International Fire Code

Add new text as follows:

903.2.4.2 Group F-1 Distilled Spirits. An automatic sprinkler system shall be provided throughout a Group F-1 fire area used for the manufacture of distilled spirits.

903.2.9.3 Group S-1 Distilled spirits or wine.
An automatic sprinkler system shall be provided throughout a Group S-1 fire area used for the bulk storage of distilled spirits or wine.

CHAPTER 40
STORAGE OF DISTILLED SPIRITS AND WINES

SECTION 4001
GENERAL

4001.1 General. The storage of distilled spirits and wines in barrels and casks shall comply with this chapter in addition to other applicable requirements of this code.

4001.1.1 Nonapplicability. Chapter 50 and Chapter 57 of this code are not applicable to the storage of distilled spirits and wines in barrels and casks as identified in Section 5001.1, Exception 10, and Section 5701.2, Item 10.

SECTION 4002
DEFINITIONS

4002.1 Terms defined in Chapter 2. Words and terms used in this chapter and defined in Chapter 2 shall have the meanings ascribed to them as defined therein.

SECTION 4003
PRECAUTIONS AGAINST FIRE

4003.1 Spill Control. Drainage or containment systems shall be provided by means of curbs, scuppers, special drains, or other suitable means to prevent the flow of spills throughout the building.

4003.2 Ventilation. Ventilation shall be provided for rooms and spaces where distilled spirits and wines in barrels and casks are stored in accordance with the International Mechanical Code and one of the following:

1. The rooms and spaces shall be ventilated at a rate sufficient to maintain the concentration of vapors within the area at or below 25% of the LFL . This shall be confirmed by sampling of the actual vapor concentration under normal operating conditions. The sampling shall be conducted throughout the enclosed storage area extending to or toward the bottom and the top of the enclosed storage area. The vapor concentration used to determine the required ventilation rate shall be the highest measured concentration during the sampling procedure. The sampling shall be conducted manually or by installation of a continuously monitoring flammable vapor detection system.
2. The rooms and spaces shall be provided exhaust ventilation at a rate of not less than 1 cfm/ft2 (0.3 m3/min) of solid floor area. The exhaust ventilation shall be accomplished by natural or mechanical means, with discharge of the exhaust to a safe location outside the building.

4003.3 Sources of ignition. Sources of ignition shall be controlled in accordance with Sections 4003.3.1 through 4003.4.

4003.3.1 Smoking. Smoking shall be prohibited and "No Smoking" signs provided as follows:

1. In rooms or areas where hazardous materials are stored or dispensed or used in open systems in amounts requiring a permit in accordance with Section 105.6 and 105.7
2. Within 25 feet (7620mm) of outdoor storage, dispensing or open use areas.
3. Facility or areas within facilities that have been designated as totally "no smoking" shall have "No Smoking" signs placed at all entrances to the facility or area. Designated areas within such facilities where smoking is permitted either permanently or temporarily shall be identified with signs designating that smoking is permitted in these areas only.
4. In rooms or areas where flammable or combustible hazardous materials are stored, dispensed or used.

Signs required by this section shall be in English as a primary language or in symbols allowed by this code and shall comply with Section 310.

4003.3.2 Open Flame. Open flames and high-temperature devices shall not be used in a manner that creates a hazardous condition and shall be listed for use with the hazardous materials stored or used.

4003.3.3 Industrial trucks. Powered industrial trucks used in areas designated as hazardous (classified)locations in accordance with NFPA 70 shall be listed and labeled for use in the environment intended in accordance with NFPA 505.

4003.3.4 Electrical. Electrical wiring and equipment shall be installed and maintained in accordance with Section 605 and NFPA 70.

4003.4 Lightning. Structures containing barrel storage should be protected from lightning. The lightning protection equipment shall be installed in accordance with NFPA 780 and NFPA 70.

SECTION 4004
STORAGE

4004.1 Storage. Storage shall be in accordance with this section and Section 315.

4004.2 Empty containers. The storage of empty containers previously used for the storage of flammable or combustible liquids, unless free from explosive vapors, shall be stored as required for filled containers.

4004.3 Basement storage. Class I liquids shall be allowed to be stored in basements in amounts not exceeding the maximum allowable quantity over control area for use-open systems in Table 5003.1.1(1), provided that automatic suppression and other fire protection are provided in accordance with Chapter 9. Class II and IIIA liquids shall also be allowed to be stored in basements, provided that automatic suppression and other fire protection are provided in accordance with Chapter 9.

4004.4 Bulk beverage storage areas. There shall be no storage of combustible materials in the bulk beverage storage areas not related to the beverage storage activities.

SECTION 4005
FIRE PROTECTION

4005.1 Automatic sprinkler system. The storage of distilled spirits and wines shall be protected by an approved automatic sprinkler system as required by Chapter 9.

4005.2 Portable Fire Extinguishers. Approved portable fire extinguishers shall be provided in accordance with Section 906.

SECTION 4006
SIGNAGE

4006.1 Hazard identification signs. Unless otherwise exempted by the fire code official, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on stationary containers and above ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the fire code official.

4006.1.1 Maintenance and style. Signs and markings required by Section 4006.1 shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color, and lettering shall be approved.

Revise as follows:

5001.1 Scope. Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).

2. Quantities of alcoholic beverages in retail or wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturers' instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 605).
7. Stationary storage battery systems regulated by Section 1206.2.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturers' original consumer packaging in Group M occupancies.
10. The storage of beer, distilled spirits and wines in ~~wooden~~ barrels and casks.
11. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.

5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including:

1. Specific provisions for flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
2. Medicines, foodstuffs, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
4. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 603. For abandonment of fuel oil tanks, this chapter applies.
5. Refrigerant liquids and oils in refrigeration systems (see Section 605).
6. Storage and display of aerosol products complying with Chapter 51.
7. Storage and use of liquids that do not have a fire point when tested in accordance with ASTM D92.
8. Liquids with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion.
9. Liquids without *flash points* that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons.
10. The storage of beer, distilled spirits and wines in ~~wooden~~ barrels and casks.
11. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 608 and NFPA 30.

Add new standard(s) as follows:

NFPA
780-17: Standard f or the Installation of Lightning Protection Systems

2018 International Mechanical Code

Revise as follows:

~~[F]~~**502.9.5 Flammable and combustible liquids.** Exhaust ventilation systems shall be provided as required by Sections 502.9.5.1 through 502.9.5.5 for the storage, use, dispensing, mixing and handling of flammable and combustible liquids. Unless otherwise specified, this section shall apply to any quantity of flammable and combustible liquids.

~~**Exception**~~ **Exceptions:**

1. This section shall not apply to flammable and combustible liquids that are exempt from the International Fire Code.
2. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the International Fire Code.

Add new standard(s) as follows:

NFPA
780-17: Standard f or the Installation of Lightning Protection Systems

Reason: The code currently allows extraction equipment to be either listed or approved. If the equipment is not listed, approval is based on a registered design professional preparing a technical report on the equipment, followed up by a site inspection.

UL 1389 was developed to investigate plant extraction equipment that utilizes flammable solvents. This proposal adopts UL 1389 as the standard used to list extraction equipment, and reformats section 3904 to clarify that the technical report and registered design professional site inspection are only required for extraction systems that are not listed.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal only identifies the standard used to list extraction equipment, and does not remove the option for non-listed equipment to be provided under certain identified conditions.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved as the exceptions for Group H occupancies are needed and the chapter addressing the specific hazards is necessary. (Vote: 13-1)

Assembly Action: **None**

Final Action

F276-18 **AS**

M8499/M63-18

Date Submitted 2/4/2021
Chapter 6
Section 602.2
Affects HVHZ Yes
Proponent Mo Madani
Attachments Yes
TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review
Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

603.5.1

Summary of Modification

This proposed code change continues to prohibits direct evaporatively cooled air from being discharged into a gypsum board supply air plenum, while allowing this an effective and efficient cooling option, with a gypsum board return air plenum.

Rationale

This code sentence as written, may be interpreted to prohibit the use of a gypsum board plenum in any building using any form of evaporative cooling. It also prohibits the use of individual or combination direct and indirect evaporative cooling systems where the supply air system is ducted. The proponent assumes the intent is to prevent a condition where the gypsum board in a plenum is exposed to air with a potentially high relative humidity.

This proposed code change continues to prohibits direct evaporatively cooled air from being discharged into a gypsum board supply air plenum, while allowing this extremely effective and efficient cooling option, with a gypsum board return air plenum.

Direct and indirect evaporative cooling systems use only a fraction of the energy used by direct expansion cooling systems. These systems are very effect and commonly used in buildings of virtually all uses and occupancies in dry climates. Cooling towers, a form of indirect evaporative cooling are used in all climates.

Please see ASHRAE Handbook - HVAC Systems and Equipment, Chapter 41, for a detailed discussion on Evaporative Air-Cooling Equipment

For clarity, the following definitions have been proposed this code cycle:

Direct Evaporative Cooling- The evaporative cooling process where water evaporates directly into the air stream, reducing the air's dry-bulb temperature and raising its humidity level.

Indirect Evaporative Cooling-The evaporative cooling process where water evaporates into a secondary air stream, removing heat from a primary air stream using a heat exchanger.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

602.2 Construction. Plenum enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.5 of the International Building Code or such materials shall have 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.

The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125°F (52°C) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. ~~Air~~ Supply air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing direct evaporative ~~coolers~~ cooling systems.

603.5.1 Gypsum ducts. The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125°F (52°C) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. ~~Air~~ Supply air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing direct evaporative ~~coolers~~ cooling systems.

Code Change No: M63-18

Original Proposal

Section(s): 602.2, 603.5.1

Proponents: Brent Ursenbach, Salt Lake County Planning and Development Services, representing Salt Lake County Planning and Development Services (bursenbach@slco.org)

2018 International Mechanical Code

Revise as follows:

602.2 Construction. Plenum enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.5 of the International Building Code or such materials shall have 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.

The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. ~~Air~~ Supply air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing direct evaporative ~~coolers~~ cooling systems.

603.5.1 Gypsum ducts. The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125ºF (52ºC) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. ~~Air~~ Supply air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing direct evaporative ~~coolers~~ cooling systems.

Reason: This code sentence as written, may be interpreted to prohibit the use of a gypsum board plenum in any building using any form of evaporative cooling. It also prohibits the use of individual or combination direct and indirect evaporative cooling systems where the supply air system is ducted. The proponent assumes the intent is to prevent a condition where the gypsum board in a plenum is exposed to air with a potentially high relative humidity.

This proposed code change continues to prohibits *direct* evaporatively cooled air from being discharged into a gypsum board *supply* air plenum, while allowing this extremely effective and efficient cooling option, with a gypsum board *return* air plenum.

Direct and indirect evaporative cooling systems use only a fraction of the energy used by direct expansion cooling systems. These systems are very effect and commonly used in buildings of virtually all uses and occupancies in dry climates. Cooling towers, a form of indirect evaporative cooling are used in all climates.

Please see ASHRAE Handbook - HVAC Systems and Equipment, Chapter 41, for a detailed discussion on Evaporative Air-Cooling Equipment

For clarity, the following definitions have been proposed this code cycle:

> Direct Evaporative Cooling- The evaporative cooling process where water evaporates directly into the air stream, reducing the air's dry-bulb temperature and raising its humidity level.
> Indirect Evaporative Cooling-The evaporative cooling process where water evaporates into a secondary air stream, removing heat from a primary air stream using a heat exchanger.

Cost Impact: The code change proposal will decrease the cost of construction.
In dry climates, direct and indirect evaporative cooling systems often provide up to 75% of the required cooling capacity, allowing the DX cooling system sizing to be similarly reduced. This decreases the initial cost of construction, while reducing the operating cost over the life of the systems.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposal will prevent moisture in plenums. (Vote 10-0)

Assembly Action: **None**

Final Hearing Results

M63-18	**AS**

M8501/M71-18

Date Submitted	2/4/2021	**Section**	602.2.1.8	**Proponent**	Mo Madani
Chapter	6	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

This proposal clarifies that when materials do not meet minimum plenum safety requirements, simply covering them with plenum rated insulation may not be adequate protection, depending on the properties of the material being protected.

Rationale

Fire walls, partitions, and similar protective assemblies are tested as composite assemblies, not as individual components. It is critical to have the best understanding possible of how an installed system will perform in the field which equates to replicating those conditions, especially in a plenum. This proposal clarifies that when materials do not meet minimum plenum safety requirements, simply covering them with plenum rated insulation may not be adequate protection, depending on the properties of the material being protected. Some insulation manufacturers market insulation materials for plenums, utilizing a "modified" E84 test, yet the code does not have provisions to use modified tests. Although there are insulation products that meet the flame and smoke requirements for plenums, the materials wrapped within them may begin to degrade, deteriorate and off-gas toxic fumes and substances into plenum spaces due to the high heat, even when protected. This off-gas could result in potential health and life-safety issues for occupants and first responders. All materials within plenums must meet the minimum plenum criteria and the code specifically identifies the proper tests. The IMC does not currently allow for "modified" test procedures in plenums.

Approved As Modified

2018 International Mechanical Code

Revise as follows:

602.2.1.8 Pipe and duct insulation within plenums. Pipe and duct insulation contained within plenums, including insulation adhesives, shall have 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, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct 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). Pipe and duct insulation shall be listed and labeled. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indexes except where the pipe or duct and its related insulation, coatings, and adhesives are tested as a composite assembly in accordance with section 602.2.1.7.

Committee Action: Approved as Modified

Modify proposal as follows:

602.2.1.8 Pipe and duct insulation within plenums.

Pipe and duct insulation contained within plenums, including insulation adhesives, shall have 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, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct 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). Pipe and duct insulation shall be listed and labeled. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indexes ~~specified in Section 602.2.1.7~~ except where the pipe or duct and its related insulation, coatings, and adhesives are tested as a composite assembly in accordance with section 602.2.1.7. ~~of the pipe, ducts, tubing, insulation, coatings and adhesives in accordance with ASTM E84 or UL 723.~~

Code Change No: M71-18

Original Proposal

Section(s): 602.2.1.8

Proponents: Jay Peters, Codes and Standards International, representing The Copper Development Association (peters.jay@me.com)

2018 International Mechanical Code

Revise as follows:

602.2.1.8 Pipe and duct insulation within plenums. Pipe and duct insulation contained within plenums, including insulation adhesives, shall have 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, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct 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). Pipe and duct insulation shall be listed and labeled. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indexes specified in Section 602.2.1.7 except where tested as a composite assembly of the pipe, tubing, insulation, coatings and adhesives in accordance with ASTM E84 or UL 723.A

Reason: Fire walls, partitions, and similar protective assemblies are tested as composite assemblies, not as individual components. It is critical to have the best understanding possible of how an installed system will perform in the field which equates to replicating those conditions, especially in a plenum. This proposal clarifies that when materials do not meet minimum plenum safety requirements, simply covering them with plenum rated insulation may not be adequate protection, depending on the properties of the material being protected. Some insulation manufacturers market insulation materials for plenums, utilizing a "modified" E84 test, yet the code does not have provisions to use modified tests. Although there are insulation products that meet the flame and smoke requirements for plenums, the materials wrapped within them may begin to degrade, deteriorate and off-gas toxic fumes and substances into plenum spaces due to the high heat, even when protected. This off-gas could result in potential health and life-safety issues for occupants and first responders. All materials within plenums must meet the minimum plenum criteria and the code specifically identifies the proper tests. The IMC does not currently allow for "modified" test procedures in plenums.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal clarifies that installations must meet the existing code provisions.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

602.2.1.8 Pipe and duct insulation within plenums.

Pipe and duct insulation contained within plenums, including insulation adhesives, shall have 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, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct 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). Pipe and duct insulation shall be listed and labeled. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indexes ~~specified in Section 602.2.1.7~~ except where the pipe or duct and its related insulation, coatings, and adhesives are tested as a composite assembly in accordance with section 602.2.1.7. ~~of the pipe, ducts, tubing, insulation, coatings and adhesives in accordance with ASTM E84 or UL 723.~~

Committee Reason: Approval was based on the proponent's published reason statement. The modification references a code section instead of test standards. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M71-18	**AM**

M8506/M74-18

Date Submitted 2/5/2021	**Section** 604.3	**Proponent** Mo Madani
Chapter 6	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

The proposal adds an exception allowing a greater smoke-developed index for some applications of foam plastic insulation on the exterior surfaces of ducts in attics or crawlspaces under certain specified conditions

Rationale

The proposal is the same as M98-15 PC1. M98 was approved as modified by the committee. PC1 was approved during the Public Comment hearing but failed to get the necessary majority in the online vote.

The proposal adds an exception allowing a greater smoke-developed index for some applications of foam plastic insulation on the exterior surfaces of ducts in attics or crawlspaces under certain specified conditions. The exception applies only to foam insulation meeting the requirements of IBC Section 2603 and the ignition barrier requirements in IBC Section 2603.4.1.6. This additional option is consistent with the options in Section M1601.3 of the IRC.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

604.3 Coverings and linings. ~~Coverings~~ 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.

Exception: Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawlspaces shall be subject to all of the following requirements:

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.
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).
3. The foam plastic insulation complies with the requirements of Section 2603 of the International Building Code.
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.

Code Change No: M74-18

Original Proposal

Section(s): 604.3

Proponents: Mike Fischer, Kellen Company, representing The Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Mechanical Code

Revise as follows:

604.3 Coverings and linings. ~~Coverings~~ 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.

Exception: Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawlspaces shall be subject to all of the following requirements:

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.
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).
3. The foam plastic insulation complies with the requirements of Section 2603 of the International Building Code.
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.

Reason: The proposal is the same as M98-15 PC1. M98 was approved as modified by the committee. PC1 was approved during the Public Comment hearing but failed to get the necessary majority in the online vote.

The proposal adds an exception allowing a greater smoke-developed index for some applications of foam plastic insulation on the exterior surfaces of ducts in attics or crawlspaces under certain specified conditions. The exception applies only to foam insulation meeting the requirements of IBC Section 2603 and the ignition barrier requirements in IBC Section 2603.4.1.6. This additional option is consistent with the options in Section M1601.3 of the IRC.

Cost Impact: The code change proposal will decrease the cost of construction.
The proposal will permit greater flexibility in material selection.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 7-4)

Assembly Action: **None**

Final Hearing Results

M74-18	**AS**

M8507/M80-18

Date Submitted 2/5/2021	**Section** 801.21	**Proponent** Mo Madani
Chapter 8	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Adds new Section 801.21 "Blocked vent switch", adding code language to address a device that will stop burner operation in the event that the venting system is obstructed.

Rationale

Such devices can save lives in the event that a chimney or Type L vent is blocked by debris, decaying masonry or dead animals. Gas furnaces are equipped with thermal and/or pressure devices that will sense failure of the venting system, but such is not known to be required for oil-fired appliances. Such devices have been installed for many decades, but not necessarily required. These devices are typically provided for or are an option for draft regulators that are commonly installed in the vent of oil-fired appliances.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as Modified

Original Proposal:

2018 International Mechanical Code

Add new text as follows:

801.21Blocked vent switch. The venting system for oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.

Modified proposal:

801.21 Blocked vent switch.~~The venting system for~~ oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions**.**

Code Change No: M80-18

Original Proposal

Section(s): 801.21 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Add new text as follows:

801.21 Blocked vent switch. The venting system for oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.

Reason: Such devices can save lives in the event that a chimney or Type L vent is blocked by debris, decaying masonry or dead animals. Gas furnaces are equipped with thermal and/or pressure devices that will sense failure of the venting system, but such is not known to be required for oil-fired appliances. Such devices have been installed for many decades, but not necessarily required. These devices are typically provided for or are an option for draft regulators that are commonly installed in the vent of oil-fired appliances.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction because an additional device is mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

801.21 Blocked vent switch. ~~The venting system for~~ oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.

Committee Reason: Approval was based on the proponent's published reason statement. The modification puts the compliance burden on the appliance listing, rather than obligating the vent manufacturer. (Vote 10-1)

Assembly Action: **None**

Final Hearing Results

M80-18	**AM**

M8508/M81-18

Date Submitted 2/5/2021	**Section** 920	**Proponent** Mo Madani
Chapter 9	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

920.1, 920.2,920.3, 920.4

Summary of Modification

Adds new Section 920.4 "Prohibited Uses". Adds prohibition concerning suspended type heaters.

Rationale

Suspended type heaters should not be in the means of egress because of the element of risk for these types of heaters, such as open flame, carbon monoxide and other products of combustion. Fuel being piped to these heaters could be an additional risk. The defend in place concept relies on the means of egress to temporarily house residents and patients (K523).

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/.

Approved as Submitted

2018 International Mechanical Code

SECTION 920
UNIT HEATERS

920.1 General. Unit heaters shall be installed in accordance with the listing and the manufacturer's instructions. Oil-fired unit heaters shall be tested in accordance with UL 731.

920.2 Support. Suspended-type unit heaters shall be supported by elements that are designed and constructed to accommodate the weight and dynamic loads. Hangers and brackets shall be of noncombustible material. Suspended-type oil-fired unit heaters shall be installed in accordance with NFPA 31.

920.3 Ductwork. A unit heater shall not be attached to a warm-air duct system unless listed for such installation.

Add new text as follows:

<u>**920.4Prohibited Uses.**In Group I-2 and ambulatory care facilities, suspended-type unit heaters are prohibited in corridors, exit access stairways and ramps, exit stairways and ramps and patient sleeping areas.</u>

Code Change No: M81-18

Original Proposal

Section(s): SECTION 920.4 (New)

Proponents: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Mechanical Code

SECTION 920
UNIT HEATERS

920.1 General. Unit heaters shall be installed in accordance with the listing and the manufacturer's instructions. Oil-fired unit heaters shall be tested in accordance with UL 731.

920.2 Support. Suspended-type unit heaters shall be supported by elements that are designed and constructed to accommodate the weight and dynamic loads. Hangers and brackets shall be of noncombustible material. Suspended-type oil-fired unit heaters shall be installed in accordance with NFPA 31.

920.3 Ductwork. A unit heater shall not be attached to a warm-air duct system unless listed for such installation.

Add new text as follows:

<u>**920.4 Prohibited Uses.** In Group I-2 and ambulatory care facilities, suspended-type unit heaters are prohibited in corridors, exit access stairways and ramps, exit stairways and ramps and patient sleeping areas.</u>

Reason: Suspended type heaters should not be in the means of egress because of the element of risk for these types of heaters, such as open flame, carbon monoxide and other products of combustion. Fuel being piped to these heaters could be an additional risk. The defend in place concept relies on the means of egress to temporarily house residents and patients (K523).

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes.* Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The elimination of this type of heater unit will not add cost to these types of facilities

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: This aligns the IMC with health care regulations to avoid conflicts. (Vote 9-2)

Assembly Action: **None**

Final Hearing Results

M81-18	**AS**

M8509/M83-18

Date Submitted	2/5/2021	**Section**	905.1	**Proponent**	Mo Madani
Chapter	9	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

Adds text to Section 905.1 "General", adding requirement for wood burning Residential Hydronic Heaters to be EPA certified.

Rationale

Over the last few years there have been numerous states that have been banning outdoor hydronic heaters, the reason being that they were very dirty. In work with ASTM and EPA, the units that are now being certified are a completely different product and should be considered as such and allowed by code. If the product is going to be installed, they need to be EPA certification standards.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

905.1 General. Fireplace stoves and solid-fuel-type room heaters shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Fireplace stoves shall be tested in accordance with UL 737. Solid-fuel-type room heaters shall be tested in accordance with UL 1482. Fireplace inserts intended for installation in fireplaces shall be listed and labeled in accordance with the requirements of UL 1482 and shall be installed in accordance with the manufacturer's instructions. <u>New Wood Burning Residential Hydronic Heaters shall be EPA certified.</u>

Code Change No: M83-18

Original Proposal

Section(s): 905.1 (New)

Proponents: Tom Stroud, representing Hearth, Patio, and Barbecue Association (stroud@hpba.org)

2018 International Mechanical Code

Revise as follows:

905.1 General. Fireplace stoves and solid-fuel-type room heaters shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Fireplace stoves shall be tested in accordance with UL 737. Solid-fuel-type room heaters shall be tested in accordance with UL 1482. Fireplace inserts intended for installation in fireplaces shall be listed and labeled in accordance with the requirements of UL 1482 and shall be installed in accordance with the manufacturer's instructions. New Wood Burning Residential Hydronic Heaters shall be EPA certified.

Reason: Over the last few years there have been numerous states that have been banning outdoor hydronic heaters, the reason being that they were very dirty. In work with ASTM and EPA, the units that are now being certified are a completely different product and should be considered as such and allowed by code. If the product is going to be installed, they need to be EPA certification standards.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Currently the only Outdoor Hydronic Heaters being sold in the US are required to meet EPA Certification, so there is not a cost impact related to the installation. This code addition would allow the money spent for the unit could meet the approval by the AHJ.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-1)

Assembly Action: **None**

Final Hearing Results

M83-18	**AS**

M8513/M85-18

Date Submitted 2/5/2021	**Section** 929	**Proponent** Mo Madani
Chapter 9	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

202, 929, Chapter 15.

Summary of Modification

Adds Section 929 "Unvented Alcohol Fuel Burning Decorative Appliances", this proposal adds a provision for a newer type of decorative appliance.

Rationale

This proposal adds a provision for a newer type of decorative appliance. It provides clear and specific requirements for the installation of unvented, self-contained alcohol fuel burning appliances. The requisite ANSI consensus UL Standard 1370 includes performance-based criteria that provide a consistent application of requirements and best practices to ensure safe installation and operation. The Standard includes combustion testing for carbon dioxide and carbon monoxide emission limits, oxygen depletion, materials and construction requirements. The Standard also tests for user abuse testing, stability, temperature, and wind tests. These appliances are intended for decorative purposes and not intended to be utilized as a primary heat source. Denatured alcohol is formulated for the application and limited to a maximum input rate of 0.25 gallons of fuel per hour (0.95 liters per hour). They are not provided with means for duct connection nor is there electric/mechanical assist of heated air movement, such as a fan-blower assembly. The appliances are labeled with minimum room volume requirements for installation.
The propsal improves the Code by providing installers and building officials with a clear path on specifications that pertain to these products. Installation is intended to be in accordance with local codes, the manufacturer's installation instructions and markings on the appliance.

Approved as Submitted

2018 International Mechanical Code

Add new definition as follows:

SECTION 202
GENERAL DEFINITIONS

UNVENTED ALCOHOL FUEL BURNING DECORATIVE APPLIANCE. A stationary, self-contained appliance intended to be directly or indirectly secured to a wall or floor and not intended for duct connection. Such appliance burns alcohol and is made in a manufacturing facility for subsequent delivery to the installation site.

Add new text as follows:

SECTION 929
UNVENTED ALCOHOL FUEL BURNING DECORATIVE APPLIANCES

929.1 GENERAL. Unvented alcohol fuel-burning decorative appliances shall be listed and labeled in accordance with UL1370 and shall be installed in accordance with the conditions of the listing, manufacturer's installation instructions, and Chapter 3.

Add new standard(s) as follows:

CHAPTER 15
REFERENCED STANDARDS

UL
UL1370-11: Unvented Alcohol Fuel Burning Decorative Appliances, with revisions through March 25, 2016

Code Change No: M85-18

Original Proposal

Section(s): 202, SECTION 929 (New), 929.1 (New), Chapter 15

Proponents: Bo Manalo, EcoSmart Inc., representing EcoSmart Inc. (bo@ecosmartfire.com)

2018 International Mechanical Code

Add new definition as follows:

SECTION 202
GENERAL DEFINITIONS

UNVENTED ALCOHOL FUEL BURNING DECORATIVE APPLIANCE. A stationary, self-contained appliance intended to be directly or indirectly secured to a wall or floor and not intended for duct connection. Such appliance burns alcohol and is made in a manufacturing facility for subsequent delivery to the installation site.

Add new text as follows:

SECTION 929
UNVENTED ALCOHOL FUEL BURNING DECORATIVE APPLIANCES

929.1 GENERAL. Unvented alcohol fuel-burning decorative appliances shall be listed and labeled in accordance with UL1370 and shall be installed in accordance with the conditions of the listing, manufacturer's installation instructions, and Chapter 3.

Add new standard(s) as follows:

CHAPTER 15
REFERENCED STANDARDS

UL
UL1370-11: Unvented Alcohol Fuel Burning Decorative Appliances, with revisions through March 25, 2016

Reason: This proposal adds a provision for a newer type of decorative appliance. It provides clear and specific requirements for the installation of unvented, self-contained alcohol fuel burning appliances. The requisite ANSI consensus UL Standard 1370 includes performance-based criteria that provide a consistent application of requirements and best practices to ensure safe installation and operation. The Standard includes combustion testing for carbon dioxide and carbon monoxide emission limits, oxygen depletion, materials and construction requirements. The Standard also tests for user abuse testing, stability, temperature, and wind tests.

These appliances are intended for decorative purposes and not intended to be utilized as a primary heat source. Denatured alcohol is formulated for the application and limited to a maximum input rate of 0.25 gallons of fuel per hour (0.95 liters per hour). They are not provided with means for duct connection nor is there electric/mechanical assist of heated air movement, such as a fan-blower assembly. The appliances are labeled with minimum room volume requirements for installation.

The propsal improves the Code by providing installers and building officials with a clear path on specifications that pertain to these products. Installation is intended to be in accordance with local codes, the manufacturer's installation instructions and markings on the appliance.

Cost Impact: The code change proposal will increase the cost of construction
This may reduce the cost of construction by simplifying the design/review process.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 9-2)

Assembly Action: **None**

Final Hearing Results

M85-18	**AS**

M8514/M86-18 Part I

Date Submitted 2/5/2021	**Section** 908.1	**Proponent** Mo Madani
Chapter 9	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

916.1, 918.1, 918.2, 1101.2, Reference Standards.

Summary of Modification

Adds new Sections 908.1 "General", 916.1 "General", 918.1, 918.2, 1101.2. Requirements including provisions for the most current technology and use of flammable refrigerants, and is currently being used to list new products.

Rationale

The UL Standard for Safety for Heating and Cooling Equipment, UL 1995 will be phased out by the year 2020, and will be replaced by UL 60335-2-40, the Standard for Safety for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers. UL 60335-2-40 is harmonized with requirements in Canada and Europe. These requirements include provisions for the most current technology and use of flammable refrigerants, and is currently being used to list new products. UL 412 and UL 471 will be phased out by the year 2020 and will be replaced by UL 60335-2-89.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

908.1 General. A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's instructions. Factory-built cooling towers shall be listed in accordance with UL 1995, or UL/CSA 60335-2-40.

916.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's instructions. Oil-fired pool and spa heaters shall be tested in accordance with UL 1261. Pool and spa heat pump water heaters shall comply with UL 1995, or UL/CSA 60335-2-40, orCSA C22.2 No. 236.

> **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or CSA C22.2 No. 218.1.

918.1 Forced-air furnaces. Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995~~.~~ or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer's instructions.

918.2 Heat pumps. Electric heat pumps shall be tested in accordance with UL 1995, or UL/CSA 60335-2-40.

1101.2 Factory-built equipment and appliances. Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with UL 207, UL 412, UL 471 ~~or1995~~, UL1995, UL/CSA 60335-2-40, or UL 60335-2-89. Such equipment and appliances are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Add new standard(s) as follows:

UL
UL/CSA 60335-2-40 -17: Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers.

UL 60335-2-89-17: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor

Code Change No: M86-18 Part I

Original Proposal

Section(s): 908.1, 916.1, 918.1, 918.2, 1101.2, UL Chapter 15, 15 UL, UL Chapter 15 (New)

Proponents: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IMC COMMITTEE AND PART II WILL BE HEARD BY THE IRC M/P COMMITTEE. PLEASE SEE THE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Mechanical Code

Revise as follows:

908.1 General. A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's instructions. Factory-built cooling towers shall be listed in accordance with UL 1995, or UL/CSA 60335-2-40.

916.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's instructions. Oil-fired pool and spa heaters shall be tested in accordance with UL 1261. Pool and spa heat pump water heaters shall comply with UL 1995, or UL/CSA 60335-2-40, or CSA C22.2 No. 236.

> **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or CSA C22.2 No. 218.1.

918.1 Forced-air furnaces. Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995~~.~~ or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer's instructions.

918.2 Heat pumps. Electric heat pumps shall be tested in accordance with UL 1995, or UL/CSA 60335-2-40.

1101.2 Factory-built equipment and appliances. Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with UL 207, UL 412, UL 471 ~~or 1995~~, UL1995, UL/CSA 60335-2-40, or UL 60335-2-89. Such equipment and appliances are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Add new standard(s) as follows:

UL

UL/CSA 60335-2-40 -17: Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers.

UL 60335-2-89-17: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor

Reason: The UL Standard for Safety for Heating and Cooling Equipment, UL 1995 will be phased out by the year 2020, and will be replaced by UL 60335-2-40, the Standard for Safety for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers. UL 60335-2-40 is harmonized with requirements in Canada and Europe. These requirements include provisions for the most current technology and use of flammable refrigerants, and is currently being used to list new products. UL 412 and UL 471 will be phased out by the year 2020 and will be replaced by UL 60335-2-89.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
It is not anticipated that the change in the product standards will increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-1)

Assembly Action: **None**

Final Hearing Results

M86-18 Part I **AS**

M8516/M87-18

Date Submitted	2/5/2021	**Section**	1004.1	**Proponent**	Mo Madani
Chapter	10	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modification of text of Section 1004.1 "Standards", IMC to be modified to reflect the proper application of referenced codes.

Rationale

The IMC jurisdictional references to ASME CSD-1 and NFPA 85 are incorrect -- slightly. Per the IMC, boilers rated 12,500,000 Btu/h are within the jurisdiction of CSD-1; this is not correct. The IMC needs to be modified to reflect the proper application of referenced codes. NFPA 85 has jurisdiction of boilers 12,500,000 Btu/h and greater; CSD-1 includes boilers less than 12.5 million Btu/h.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1004.1 Standards. Boilers shall be designed, constructed and certified in accordance with the ASME Boiler and Pressure Vessel Code, Section I or IV. Controls and safety devices for boilers with fuel input ratings of less than 12,500,000 Btu/hr (3,662,500 W) ~~or less~~ shall meet the requirements of ASME CSD-1. Controls and safety devices for boilers with inputs greater than or equal to 12,500,000 Btu/hr (3,662,500 W) shall meet the requirements of NFPA 85. Packaged oil-fired boilers shall be listed and labeled in accordance with UL 726. Packaged electric boilers shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523.

Code Change No: M87-18

Original Proposal

Section(s): 1004.1

Proponents: Donald Jones, Representing myself only - not my employer, representing Self (donald_m_jones@att.net)

2018 International Mechanical Code

Revise as follows:

1004.1 Standards. Boilers shall be designed, constructed and certified in accordance with the ASME Boiler and Pressure Vessel Code, Section I or IV. Controls and safety devices for boilers with fuel input ratings of less than 12,500,000 Btu/hr (3,662,500 W) ~~or less~~ shall meet the requirements of ASME CSD-1. Controls and safety devices for boilers with inputs greater than or equal to 12,500,000 Btu/hr (3,662,500 W) shall meet the requirements of NFPA 85. Packaged oil-fired boilers shall be listed and labeled in accordance with UL 726. Packaged electric boilers shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523.

Reason: The IMC jurisdictional references to ASME CSD-1 and NFPA 85 are incorrect – slightly. Per the IMC, boilers rated 12,500,000 Btu/h are within the jurisdiction of CSD-1; this is **not** correct. The IMC needs to be modified to reflect the proper application of referenced codes. NFPA 85 has jurisdiction of boilers **12,500,000 Btu/h and greater**; CSD-1 includes **boilers less than 12.5 million Btu/h**.

Bibliography: NFPA 85 Chapter 1 Administration 1.1 Scope

Chapter 1 Administration

1.1* Scope. This code applies to the following:

(1) Single burner boilers, multiple burner boilers, stokers, and atmospheric fluidized bed boilers with a fuel input rating of 3.7 MWt (12.5 million Btu/hr) or greater

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Description of CSD-1 from ASME website:
The rules of this Standard cover requirements for the assembly, installation, maintenance, and operation of controls and safety devices on automatically operated boilers directly fired with gas, oil, gas-oil, or electricity, having fuel input ratings under 12,500,000 Btu/hr.
https://www.asme.org/products/codes-standards/csd1-2015-controls-safety-devices-automaticall-(1)

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
Boiler installations are already required to adhere to the referenced codes (according to the revised IMC text), so this "code change" has no effect on construction costs.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M87-18	AS

M8524/M103-18

Date Submitted 2/5/2021	**Section** 1202.4	**Proponent** Mo Madani
Chapter 12	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Table 1202.4, TABLE 1202.5, 1203.3.4, 1203.8, 1203.9, 1203.9.1, Reference Standard.

Summary of Modification

Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC) pipe was added to chapter 6 of the 2015 IPC for water service and water distribution pipe. It can also be used for hydronic piping and should be recognized to give installers another option.

Rationale

Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC) pipe was added to chapter 6 of the 2015 IPC for water service and water distribution pipe. It can also be used for hydronic piping and should be recognized in Chapter 12 of the IMC to give installers another option.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735

Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free of 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 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 ~~and~~ or fittings are manufactured in accordance with ASTM D2846.???????

Add new text as follows:

1203.8 CPVC/AL/CPVC plastic pipe. Joints between CPVC/AL/CPVC plastic pipes or fittings shall be mechanical, solvent-cemented or threaded joints conforming to Section 1203.3

Revise as follows:

~~1203.8~~ 1203.9 Polybutylene plastic pipe and tubing. Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints conforming to Section 1203.3 or heat-fusion joints conforming to Section ~~1203.8.1.~~ 1203.9.1.

~~1203.8.1~~ 1203.9.1 Heat-fusion joints. Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D3309.

Add new standard(s) as follows:

ASTM
F2855—12: Standard Specification for Chlorinated Poly(Vinyl Chloride)/Aluminum/Chlorinated Poly(Vinyl Chloride) (CPVC-AL-CPVC) Composite Pressure Tubing

Code Change No: M103-18

Original Proposal

Section(s): TABLE 1202.4, TABLE 1202.5, 1203.3.4, 1203.8 (New), 1203.9, 1203.9.1, ASTM Chapter 15, ASTM ASTM, ASTM Chapter 15 (New)

Proponents: Forest Hampton, Lubrizol Advance Materials, Inc., representing Lubrizol Advanced Materials, Inc. (forest.hampton@lubrizol.com)

2018 International Mechanical Code

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3

PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free of 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 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 ~~and~~ or fittings are manufactured in accordance with ASTM D2846.

Add new text as follows:

1203.8 CPVC/AL/CPVC plastic pipe. Joints between CPVC/AL/CPVC plastic pipes or fittings shall be mechanical, solvent-cemented or threaded joints conforming to Section 1203.3

Revise as follows:

~~**1203.8**~~ **1203.9 Polybutylene plastic pipe and tubing.** Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints conforming to Section 1203.3 or heat-fusion joints conforming to Section ~~1203.8.1.~~ 1203.9.1.

~~**1203.8.1**~~ **1203.9.1 Heat-fusion joints.** Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D3309.

Add new standard(s) as follows:

ASTM
F2855—12: Standard Specification for Chlorinated Poly(Vinyl Chloride)/Aluminum/Chlorinated Poly(Vinyl Chloride) (CPVC-AL-CPVC) Composite Pressure Tubing

Reason: Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC) pipe was added to chapter 6 of the 2015 IPC for water service and water distribution pipe. It can also be used for hydronic piping and should be recognized in Chapter 12 of the IMC to give installers another option.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The addition of this piping material will not increase the cost of construction as it only adds another option for the installer.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M103-18	**AS**

M8526/M104-18

Date Submitted 2/5/2021	**Section** 1202.4	**Proponent** Mo Madani
Chapter 12	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Chapter 12, Table 1202.4, Table 1202.5, Reference Standards.

Summary of Modification

New Standard, F3253 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems.

Rationale

ASTM's committee on plastics piping recently completed a new Standard, F3253 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems.

This new system standard covers both the oxygen barrier PEX tubing as well as the performance and material requirements for the fittings. While this standard essentially mirrors the existing ASTM F876 and F877 PEX standards from a dimensional standpoint and existing fittings interchangeability, it also mandates the inclusion of an oxygen barrier layer with defined pass/fail criteria essentially equal with the industry's long accepted norm of DIN 4726 concerning allowed oxygen permeation. This new standard also requires a minimum pull-out strength test for the fittings not included in ASTM F877 today. The inclusion of this new standard in no way changes the acceptance of the existing ASTM F876 and F877 which will remain in the mechanical hydronics code for the foreseeable future.

This standard's project has been in works for nearly 4 years and represents the work and input from nearly all of the PEX tubing manufacturers in North America. Your support of this proposal is most appreciated.

Approved as Submitted

2018 International Mechanical Code

CHAPTER 12
HYDRONIC PIPING

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876; ASTM F3253
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253
Plastic	ASTM D2466; ASTM D2467; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Add new standard(s) as follows:

ASTM
F3253—2017: Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems

Code Change No: M104-18

Original Proposal

Section(s): 12, TABLE 1202.4, TABLE 1202.5, Chapter 15

Proponents: Gary Morgan, Viega LLC, representing Viega LLC (gary.morgan@viega.us); LANCE MacNevin, representing Plastics Pipe Institute (Lmacnevin@plasticpipe.org)

2018 International Mechanical Code

CHAPTER 12
HYDRONIC PIPING

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876; ASTM F3253
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253
Plastic	ASTM D2466; ASTM D2467; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Add new standard(s) as follows:

ASTM
F3253—2017: Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems

Reason: ASTM's committee on plastics piping recently completed a new Standard, F3253 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems.

This new system standard covers both the oxygen barrier PEX tubing as well as the performance and material requirements for the fittings. While this standard essentially mirrors the existing ASTM F876 and F877 PEX standards from a dimensional standpoint and existing fittings interchangeability, it also mandates the inclusion of an oxygen barrier layer with defined pass/fail criteria essentially equal with the industry's long accepted norm of DIN 4726 concerning allowed oxygen permeation. This new standard also requires a minimum pull-out strength test for the fittings not included in ASTM F877 today. The inclusion of this new standard in no way changes the acceptance of the existing ASTM F876 and F877 which will remain in the mechanical hydronics code for the foreseeable future. This standard's project has been in works for nearly 4 years and represents the work and input from nearly all of the PEX tubing manufacturers in North America. Your support of this proposal is most appreciated.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This additional standard will not result in any increased costs for construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M104-18 **AS**

M8528/M106-18

Date Submitted 2/5/2021	**Section** 1202.5	**Proponent** Mo Madani
Chapter 12	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Table 1202.5

Summary of Modification

Adds Standards for CPVC to Table 1202.5

Rationale

CPVC is an accepted hydronic pipe in table 1202.4, but the CPVC fittings were not listed in table 1202.5. ASSE 1061 fittings are tested and listed to be used with CPVC that complies with ASTM D2846 and fittings that comply with ASTM D2846 are allowed as stated in section 1203.3.4.

Approved as Modified

Original Proposal:

2018 International Mechanical Code

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
CPVC	ASSE 1061; ASTM D2846
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Modified Proposal:

TABLE 1202.5

HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ~~ASTM F438; ASTM F439;~~ ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Code Change No: M106-18

Original Proposal

Section(s): TABLE 1202.5

Proponents: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Mechanical Code

Revise as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
<u>CPVC</u>	<u>ASSE 1061; ASTM D2846</u>
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Reason: CPVC is an accepted hydronic pipe in table 1202.4, but the CPVC fittings were not listed in table 1202.5. ASSE 1061 fittings are tested and listed to be used with CPVC that complies with ASTM D2846 and fittings that comply with ASTM D2846 are allowed as stated in section 1203.3.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding existing fittings to table

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWA C153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ~~ASTM F438; ASTM F439;~~ ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Committee Reason: Approval was based on the proponent's published reason statement. The modification relocated standards specific to CPVC that were in the nonspecific "plastic" row. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M106-18	AM

M8533/M109-18

Date Submitted 2/5/2021	**Section** 1210.4	**Proponent** Mo Madani
Chapter 12	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

TABLE 1210.4, TABLE 1210.5, 1210.8, Referenced Standards.

Summary of Modification

adding reference standard C448. This will indicate that this material is explicitly approved in ANSI/CSA/IGSHPA C448-16.ANSI/CSA/IGSHPA C448-16.

Rationale

This proposal is on behalf of the International Ground Source Heat Pump Association (IGSHPA); Mark Metzner – President of IGSHPA Canada and the Chairman of ANSI/CSA/IGSHPA C448; and The Plastics Pipe Institute.
ANSI/CSA/IGSHPA C448-16 contains specific requirements for HDPE, PEX and PE-RT piping systems (pipe and fittings) for use as ground loop piping systems. By adding reference to C448 in this row, this will indicate that this material is explicitly approved in ANSI/CSA/IGSHPA C448-16.ANSI/CSA/IGSHPA C448-16 “Design and installation of ground source heat pump systems for commercial and residential buildings” is an ANSI designated bi-national consensus standard for the design and installation of ground source heat pump systems. It was first published in February 2016.
ANSI/CSA/IGSHPA C448-16 is the first ANSI approved consensus standard for the design and installation of ground source systems.
ANSI/CSA/IGSHPA C448-16 replaces the original version known as CSA C448-02, already referenced within the IMC Chapter 12.
ANSI/CSA/IGSHPA C448-16 is a greatly enhanced system standard which includes the industry knowledge of ground source geothermal systems gained since 2002.
The Standard includes performance-based criteria that provides a consistent application of requirements and best practices throughout the United States and Canada. This Standard will ensure that stakeholders in the ground source heat pump systems market sector will supply and receive ground source heating / cooling systems that perform to design efficiency expectations and deliver true, long-term value.
This Standard was developed by a Bi-national Technical Committee which comprised of the industry's leaders from Canada and USA, including representatives of the following industry associations:

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5; CSA C448
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18; CSA C448

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; CSA 448
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; CSA 448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464 ; ASTM D2466 ; ASTM D2467 ; CSA B137.2 ; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098;ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 ; CSA 448

1210.8 Installation. Piping, valves, fittings, and connections shall be installed in accordance with ANSI/CSA/IGSHPA C448 and the conditions of approval.

Update standard(s) as follows:

CSA
ANSI/CSA/IGSHPA C448 Series—16:
Design and Installation of Earth Energy Systems

Code Change No: M109-18

Original Proposal

Section(s): TABLE 1210.4, TABLE 1210.5, 1210.8, Chapter 15

Proponents: LANCE MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org); Mark Metzner, IGSHPA Canada, representing IGSHPA Canada (markmetzner@shaw.ca)

2018 International Mechanical Code

Revise as follows:

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5; CSA C448
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18; CSA C448

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; CSA 448
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; CSA 448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464 ; ASTM D2466 ; ASTM D2467 ; CSA B137.2 ; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098;ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 ; CSA 448

1210.8 Installation. Piping, valves, fittings, and connections shall be installed in accordance with ANSI/CSA/IGSHPA C448 and the conditions of approval.

Update standard(s) as follows:

CSA
ANSI/CSA/IGSHPA C448 Series—16:
Design and Installation of Earth Energy Systems

Reason: This proposal is on behalf of the International Ground Source Heat Pump Association (IGSHPA); Mark Metzner – President of IGSHPA Canada and the Chairman of ANSI/CSA/IGSHPA C448; and The Plastics Pipe Institute.

ANSI/CSA/IGSHPA C448-16 contains specific requirements for HDPE, PEX and PE-RT piping systems (pipe and fittings) for use as ground loop piping systems. By adding reference to C448 in this row, this will indicate that this material is explicitly approved in ANSI/CSA/IGSHPA C448-16.ANSI/CSA/IGSHPA C448-16 "Design and installation of ground source heat pump systems for commercial and residential buildings" is an ANSI designated bi-national consensus standard for the design and installation of ground source heat pump systems. It was first published in February 2016.

ANSI/CSA/IGSHPA C448-16 is the first ANSI approved consensus standard for the design and installation of ground source systems.

ANSI/CSA/IGSHPA C448-16 replaces the original version known as CSA C448-02, already referenced within the IMC Chapter 12. ANSI/CSA/IGSHPA C448-16 is a greatly enhanced system standard which includes the industry knowledge of ground source geothermal systems gained since 2002.

The Standard includes performance-based criteria that provides a consistent application of requirements and best practices throughout the United States and Canada. This Standard will ensure that stakeholders in the ground source heat pump systems market sector will supply and receive ground source heating / cooling systems that perform to design efficiency expectations and deliver true, long-term value.

This Standard was developed by a Bi-national Technical Committee which comprised of the industry's leaders from Canada and USA, including representatives of the following industry associations:

American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
Geothermal Exchange Organization (GEO)
International Ground Source Heat Pump Association (IGSPHA)
International Ground Source Heat Pump Association Canada (IGSPHA - Canada)
National Ground Water Association (NGWA)
The Plastics Pipe Institute (PPI)
Geothermal National & International Initiative (GEONII)
Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI)

ANSI/CSA/IGSHPA C448-16 includes performance-based minimum requirements for industrial, commercial, institutional and residential applications. It addresses the following items related to ground source heat pump systems:

equipment and material selection (including ground loop piping)
site survey - geological and hydrogeological
open and closed loop ground source heat pump system design / engineering
direct expansion (DX) systems
installation
testing and verification
documentation
commissioning and decommissioning

ANSI/CSA/IGSHPA C448-16 applies to all ground source heat pump systems using outdoor ground loop heat exchangers as a thermal source or sink for heating and cooling, with or without supplementary heating or cooling source/s. The types of outdoor heat exchangers covered by this Standard include:

ground heat exchangers - vertical and horizontal
open-loop systems - drilled well and surface water
submerged closed loop systems - fresh water and sea water
standing column wells

The latest version of ANSI/CSA/IGSHPA C448 is available from CSA Program Manager Jovan Cheema; jovan.cheema@csagroup.org

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The code change proposal will not increase or decrease the cost of construction because it is simply identifying another industry consensus standard (C448) to which existing materials PEX and PE-RT can comply.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M109-18 **AS**

M8537/M112-18

Date Submitted	2/5/2021	**Section**	1210.4	**Proponent**	Mo Madani
Chapter	12	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Table 1210.4, Table 1210.5, Reference Standards

Summary of Modification

Adds NSF 358-4 as a referenced standard for materials for geothermal ground loop pipe and fittings to tables 1210.4, 1210.5. PE-RT piping and associated fittings are already accepted materials with referenced standards.

Rationale

At the proposal deadline, NSF 358-4 was still a draft standard, but it is expected to be published prior to the public hearing. The balloted draft standard will be submitted with the proposal. Anyone may receive a complimentary copy of this draft standard for the purpose of reviewing this proposal by emailing brown@nsf.org.

These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PE-RT piping and associated fittings are already accepted materials with referenced standards. NSF 358-4 is a proposed ANSI standard written specifically to contain requirements for PE-RT geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-4 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PE-RT piping systems

Approval as Submitted

2018 International Mechanical Code

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18; NSF 358-4

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18, NSF 358-4

Add new standard(s) as follows:

NSF
NSF 358-4-2017: Polyethylene of raised temperature (PE-RT) pipe and fittings for water-based ground-source (geothermal) heat pump systems

Code Change No: M112-18

Original Proposal

Section(s): TABLE 1210.4, TABLE 1210.5, NSF Chapter 15, 15 NSF, NSF Chapter 15 (New)

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2018 International Mechanical Code

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18; NSF 358-4

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18, NSF 358-4

Add new standard(s) as follows:

NSF
NSF 358-4-2017: Polyethylene of raised temperature (PE-RT) pipe and fittings for water-based ground-source (geothermal) heat pump systems

Reason: At the proposal deadline, NSF 358-4 was still a draft standard, but it is expected to be published prior to the public hearing. The balloted draft standard will be submitted with the proposal. Anyone may receive a complimentary copy of this draft standard for the purpose of reviewing this proposal by emailing brown@nsf.org.

These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PE-RT piping and associated fittings are already accepted materials with referenced standards. NSF 358-4 is a proposed ANSI standard written specifically to contain requirements for PE-RT geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-4 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PE-RT piping systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
Adding an additional option will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposed new standard is not yet published. (Vote 10-1)

Assembly Action: **None**

Final Hearing Results

M112-18 **AS**

M8538/M113-18

Date Submitted	2/5/2021	**Section**	1210.4	**Proponent**	Mo Madani
Chapter	12	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

TABLE 1210.4, TABLE 1210.5

Summary of Modification

Adds NSF 358-3 as reference standard for PEX piping and associated fittings.

Rationale

These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PEX piping and associated fittings are already accepted materials with referenced standards. NSF 358-3 is an ANSI standard written specifically to contain requirements for PEX geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-3 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PEX piping systems. Anyone wishing to receive a complimentary copy of this standard for the purpose of reviewing this code change can send an email to brown@nsf.org

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18

Add new standard(s) as follows:

NSF
NSF 358-4-2017: Polyethylene of raised temperature (PE-RT) pipe and fittings for water-based ground-source (geothermal) heat pump systems

Code Change No: M113-18

Original Proposal

Section(s): TABLE 1210.4, TABLE 1210.5, NSF Chapter 15, 15 NSF, NSF Chapter 15 (New)

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2018 International Mechanical Code

Revise as follows:

TABLE 1210.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F441; ASTM F442
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18

TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD (see Chapter 15)
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; NSF 358-3
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
High Density Polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18

Add new standard(s) as follows:

NSF
NSF 358-4-2017: Polyethylene of raised temperature (PE-RT) pipe and fittings for water-based ground-source (geothermal) heat pump systems

Reason: These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PEX piping and associated fittings are already accepted materials with referenced standards. NSF 358-3 is an ANSI standard written specifically to contain requirements for PEX geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-3 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PEX piping systems. Anyone wishing to receive a complimentary copy of this standard for the purpose of reviewing this code change can send an email to brown@nsf.org

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This is adding an additional choice to the code which will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M113-18 **AS**

M8539/M114-18

Date Submitted	2/5/2021	**Section**	1202.4	**Proponent**	Mo Madani
Chapter	12	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

CSA B137.5 is the CSA standard for "Crosslinked Polyethylene Tubing Systems for Pressure Applications". The requirements of B137.5 are harmonized with ASTM F876 to be equivalent. CSA B137.5 is already listed in Table 1210.4 as equivalent to ASTM F876.

Rationale

CSA B137.5 is the CSA standard for "Crosslinked Polyethylene Tubing Systems for Pressure Applications". The requirements of B137.5 are harmonized with ASTM F876 to be equivalent. CSA B137.5 is already listed in Table 1210.4 as equivalent to ASTM F876.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876<u>; CSA B137.5</u>
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

Code Change No: M114-18

Original Proposal

Section(s): TABLE 1202.4

Proponents: LANCE MacNevin, Plastic Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2018 International Mechanical Code

Revise as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM F2806
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tube (Type K, L or M)	ASTM B75; ASTM B88; ASTM B135; ASTM B251
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	ASTM F1281; CSA CAN/CSA-B-137.10
Cross-linked polyethylene (PEX) tubing	ASTM F876; CSA B137.5
Ductile iron pipe	AWWA C115/A21.15; AWWA C151/A21.51
Lead pipe	FS WW-P-325B
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9
Polypropylene (PP) plastic pipe	ASTM F2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D1785; ASTM D2241
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769; CSA B137.18
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254

Reason: CSA B137.5 is the CSA standard for "Crosslinked Polyethylene Tubing Systems for Pressure Applications". The requirements of B137.5 are harmonized with ASTM F876 to be equivalent. CSA B137.5 is already listed in Table 1210.4 as equivalent to ASTM F876.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
adding B137.5 for PEX in Table 1202.4: The code change proposal will not increase or decrease the cost of construction because the same PEX tubing that already meets the requirements of the listed ASTM F876 will already meet the requirements of CSA B137.5; requirements are harmonized.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M114-18	**AS**

M8540/M116-18

Date Submitted	2/5/2021	**Section**	1203.7	**Proponent**	Mo Madani
Chapter	12	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

FBC-M/Section 1203.9

Summary of Modification

Section 1203.7 is being revised to add mechanical joints as an option with CPVC pipe.. Mechanical joints with CPVC pipe have a proven track record in the field and are allowed by the IPC.

Rationale

Section 1203.7 is being revised to add mechanical joints as an option with CPVC pipe.. Mechanical joints with CPVC pipe have a proven track record in the field and are allowed by the IPC.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1203.7 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be mechanical, solvent-cemented or threaded joints conforming to Section 1203.3.

Code Change No: M116-18

Original Proposal

Section(s): 1203.7

Proponents: Forest Hampton, Lubrizol Advanced Materials, Inc., representing Lubrizol Advanced Materials, Inc. (forest.hampton@lubrizol.com)

2018 International Mechanical Code

Revise as follows:

1203.7 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be mechanical, solvent-cemented or threaded joints conforming to Section 1203.3.

Reason: Section 1203.7 is being revised to add mechanical joints as an option with CPVC pipe.. Mechanical joints with CPVC pipe have a proven track record in the field and are allowed by the IPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The addition of this widely used joining method will not increase the cost of construction as it only adds another option for the installer.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M116-18	**AS**

M8541/M117-18

Date Submitted	2/5/2021	**Section**	1210.6.2	**Proponent**	Mo Madani
Chapter	12	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Summary of Modification

This section is specific to plastic pipes and some of the existing language refers to terms such as "reamed" and "undercut" which only apply to metallic pipes. Revised language provides reference to manufacturers instructions.

Rationale

This section is specific to plastic pipes and some of the existing language refers to terms such as "reamed" and "undercut" which only apply to metallic pipes. The revised language is more appropriate by including reference to preparing pipe ends in accordance with manufacturer's instructions which will be specific to that particular type of plastic pipe

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1210.6.2 Preparation of pipe ends. Pipe shall be cut square~~, be reamed,~~ and be free of burrs and obstructions. ~~CPVC, PE, and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~be prepared in accordance with manufacturer's instructions.

Code Change No: M117-18

Original Proposal

Section(s): 1210.6.2

Proponents: Gary Morgan, representing Viega LLC (gary.morgan@viega.us)

2018 International Mechanical Code

Revise as follows:

1210.6.2 Preparation of pipe ends. Pipe shall be cut square~~, be reamed,~~ and be free of burrs and obstructions. ~~CPVC, PE, and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~be prepared in accordance with manufacturer's instructions.

Reason: This section is specific to plastic pipes and some of the existing language refers to terms such as "reamed" and "undercut" which only apply to metallic pipes. The revised language is more appropriate by including reference to preparing pipe ends in accordance with manufacturer's instructions which will be specific to that particular type of plastic pipe.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This is only a clarification of existing language and will not result in any increased cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M117-18	**AS**

M8542/M118-18

Date Submitted 2/5/2021
Chapter 12
Section 1210.8
Affects HVHZ Yes
Proponent Mo Madani
Attachments Yes
TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review
Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Summary of Modification

Revision to make this section read perfectly consistent with the IRC's equivalent ground-source heat-pump system loop piping section.

Rationale

The existing language "....shall be installed in accordance with the conditions of approval." is not consistent with IMC language and unclear what that statement even means. This simple revision will make this section read perfectly consistent with the IRC's equivalent ground-source heat-pump system loop piping section , M2105.17 Installation.

For information Section M2105.17 of the IRC reads as follows:

M2105.17 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the manufacturer's instructions.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1210.8 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the ~~conditions of approval~~manufacturer's instructions.

Code Change No: M118-18

Original Proposal

Section(s): 1210.8

Proponents: Gary Morgan, representing Viega LLC (gary.morgan@viega.us)

2018 International Mechanical Code

Revise as follows:

1210.8 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the ~~conditions of approval~~ manufacturer's instructions.

Reason: The existing language "....shall be installed in accordance with the conditions of approval." is not consistent with IMC language and unclear what that statement even means. This simple revision will make this section read perfectly consistent with the IRC's equivalent ground-source heat-pump system loop piping section , M2105.17 Installation.
For information Section M2105.17 of the IRC reads as follows:
M2105.17 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the manufacturer's instructions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This editorial revision simply adds clarity and consistency to the statement and has no impacts on the costs of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M118-18	**AS**

M8549/M121-18

Date Submitted 2/5/2021	**Section** 1301	**Proponent** Mo Madani
Chapter 13	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Section 1301, Section 1302, Table 1302.3, Section 1303, Reference Standards.

Summary of Modification

Modifies text of Chapter 13 "Fuel Oil Piping and Storage", addition of "fittings" to text of section related to fuel tank, piping, fittings and valves. Adds new reference standards

Rationale

Revisions for Chapter 13 have been included in one proposal for better discussion. Reason Statements will be provided under each Section number with proposed revisions.

Section 1301.4-proposed to include fittings in this section for consistency throughout the chapter.

Table 1302.3-Proposed revisions to this table include updating the Title to include both Pipe and Fittings. Currently fitting standards exist in this table. The proposed table revision includes the addition of ASTM F3226 (Press-connect fitting standard for copper, steel and stainless steel) which was recently published. ASTM A269 (stainless steel tubing standard) which is referenced in NFPA 31 and is recognized as acceptable for use in heating oil piping. Stainless steel tubing has been requested to be used due to its corrosion resistance properties. ASTM A312 (stainless steel pipe) is referenced for use in CSA B139 Installation code for Oil Burning Equipment.
Section 1303.3- this section adds press-connect joints in a new subsection 1303.3.5 and revises the section to state joints shall comply with sections 1303.3.1 through 1303.3.5.
Section 1303.3.2-Press-Connect joints have their own definition in the Chapter 2 of International Mechanical Code and needs to be uniquely identified from that of a Mechanical joint. The Mechanical Joint Definition does not exclude press-connect joints, but they are not listed under examples as types of joints see Chapter 2 definition below
Please see additional M121-18

2018 International Mechanical Code

CHAPTER 13
FUEL OIL PIPING AND STORAGE

SECTION 1301
GENERAL

1301.1 Scope. This chapter shall govern the design, installation, construction and repair of fuel-oil storage and piping systems. The storage of fuel oil and flammable and combustible liquids shall be in accordance with Chapters 6 and 57 of the International Fire Code.

1301.2 Storage and piping systems. Fuel-oil storage systems shall comply with Section 603.3 of the International Fire Code. Fuel-oil piping systems shall comply with the requirements of this code.

1301.3 Fuel type. An appliance shall be designed for use with the type of fuel to which it will be connected. Such appliance shall not be converted from the fuel specified on the rating plate for use with a different fuel without securing reapproval from the code official.

Revise as follows:

1301.4 Fuel tanks, piping<u>, fittings</u> and valves. The tank, piping<u>, fittings</u> and valves for appliances burning oil shall be installed in accordance with the requirements of this chapter. Where an oil burner is served by a tank, any part of which is above the level of the burner inlet connection and where the fuel supply line is taken from the top of the tank, an approved antisiphon valve or other siphon-breaking device shall be installed in lieu of the shutoff valve.

1301.5 Tanks abandoned or removed. All exterior above-grade fill piping shall be removed when tanks are abandoned or removed. Tank abandonment and removal shall be in accordance with Section 5704.2.13 of the International Fire Code.

SECTION 1302
MATERIAL

1302.1 General. Piping materials shall conform to the standards cited in this section.

1302.2 Rated for system. All materials shall be rated for the operating temperatures and pressures of the system, and shall be compatible with the type of liquid.

TABLE 1302.3
FUEL OIL PIPING AND FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper or copper-alloy pipe and fittings	ASTM B42; ASTM B43; ASTM B302; ASTM F3226
Copper or copper-alloy tubing and fittings (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280; ASME B16.51; ASTM F3226
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel and Stainless Steel pipe and fittings	ASTM A53; ASTM A106; ASTM A312; ASTM F3226
Steel and Stainless Steel tubing and fittings	ASTM A254; ASTM A539; ASTM A269; ASTM F3226

1302.3 Pipe standards. Fuel oil pipe shall comply with one of the standards listed in Table 1302.3.

1302.4 Nonmetallic pipe. Nonmetallic pipe shall be listed and labeled as being acceptable for the intended application for flammable and combustible liquids. Nonmetallic pipe shall be installed only outdoors, underground.

1302.5 Fittings and valves. Fittings and valves shall be approved for the piping systems, and shall be compatible with, or shall be of the same material as, the pipe or tubing.

1302.6 Bending of pipe. Pipe shall be approved for bending. Pipe bends shall be made with approved equipment. The bend shall not exceed the structural limitations of the pipe.

1302.7 Pumps. Pumps that are not part of an appliance shall be of a positive-displacement type. The pump shall automatically shut off the supply when not in operation. Pumps shall be listed and labeled in accordance with UL 343.

1302.8 Flexible connectors and hoses. Flexible connectors and hoses shall be listed and labeled in accordance with UL 536.

SECTION 1303
JOINTS AND CONNECTIONS

1303.1 Approval. Joints and connections shall be approved and of a type approved for fuel-oil piping systems. Threaded joints and connections shall be made tight with suitable lubricant or pipe compound. Unions requiring gaskets or packings, right or left couplings, and sweat fittings employing solder having a melting point of less than 1,000°F (538°C) shall not be used in oil lines. Cast-iron fittings shall not be used. Joints and connections shall be tight for the pressure required by test.

1303.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved adapter fittings. Joints between different metallic piping materials shall be made with approved dielectric fittings or copper-alloy converter fittings.

1303.2 Preparation of pipe ends. Pipe shall be cut square, reamed and chamfered and be free from all burrs and obstructions. Pipe ends shall have full-bore openings and shall not be undercut.

1303.3 Joint preparation and installation. Where required by Sections 1303.4 through 1303.9, the preparation and installation of brazed, mechanical, threaded, press-connect and welded joints shall comply with Sections 1303.3.1 through ~~1303.3.4.~~1303.3.5.

1303.3.1 Brazed joints. All joint surfaces shall be cleaned. An approved flux shall be applied where required. The joints shall be brazed with a filler metal conforming to AWS A5.8.

1303.3.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. ~~Press-connect joints shall conform to one of the standards listed in Table 1302.3.~~

1303.3.3 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

1303.3.4 Welded joints. All joint surfaces shall be cleaned by an approved procedure. The joint shall be welded with an approved filler metal.

1303.3.5 Press-Connect joints. Press-Connect joints shall be installed in accordance with the manufacturer's instructions and shall conform to one of the standards listed in Table 1302.3.

1303.4 Copper or copper-alloy pipe. Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, threaded, press-connect or welded joints complying with Section 1303.3.

1303.5 Copper or copper-alloy tubing. Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical ~~joints complying with Section 1303.3~~, or press-connect joints ~~that conform to one of the standards in Table 1302.3 or flared joints. Flared joints shall be made by a tool designed for that operation~~ complying with Section 1303.3.

1303.6 Nonmetallic pipe. Joints between nonmetallic pipe or fittings shall be installed in accordance with the manufacturer's instructions for the labeled pipe and fittings.

1303.7 Steel and Stainless Steel pipe. Joints between steel or stainless steel pipe or fittings shall be threaded, press-connect or welded joints complying with Section 1303.3 or mechanical joints complying with Section 1303.7.1.

1303.7.1 Mechanical joints. Joints shall be made with an approved elastomeric seal. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall be installed outdoors, underground, unless otherwise approved.

1303.8 Steel and Stainless Steel tubing. Joints between steel or stainless steel tubing or fittings shall be mechanical, press-connect or welded joints complying with Section 1303.3.

1303.9 Piping protection. Proper allowance shall be made for expansion, contraction, jarring and vibration. Piping other than tubing, connected to underground tanks, except straight fill lines and test wells, shall be provided with flexible connectors, or otherwise arranged to permit the tanks to settle without impairing the tightness of the piping connections.

Add new standard(s) as follows:

ASTM

A269-15: Standard Specification f or Seamless and Welded Austenitic Stainless Steel Tubing f or General Service

A312-17: Standard Specification f or Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

F3226-16: Standard Specif ication f or Metallic Press-Connect Fittings f or Piping and T ubing Systems

Modify proposal as follows:

1302.8 Flexible connectors and hoses. Flexible connectors and hoses shall be listed and labeled as being acceptable for the intended application for flammable and combustible liquids ~~in accordance with UL 536~~.

UL

~~536-97: Flexible Metallic Hose-with revisions through December 2014~~

Code Change No: M121-18

Original Proposal

Section(s): 13, SECTION 1301, 1301.1, 1301.2, 1301.3, 1301.4, 1301.5, SECTION 1302, 1302.1, 1302.2, TABLE 1302.3, 1302.3, 1302.4, 1302.5, 1302.6, 1302.7, 1302.8, SECTION 1303, 1303.1, 1303.1.1, 1303.2, 1303.3, 1303.3.1, 1303.3.2, 1303.3.3, 1303.3.4, 1303.3.5 (New), 1303.4, 1303.5, 1303.6, 1303.7, 1303.7.1, 1303.8, 1303.9, ASTM Chapter 15, 15 ASTM, ASTM Chapter 15 (New)

Proponents: Mark Fasel, representing Viega LLC (mark.fasel@viega.us)

2018 International Mechanical Code

CHAPTER 13
FUEL OIL PIPING AND STORAGE

SECTION 1301
GENERAL

1301.1 Scope. This chapter shall govern the design, installation, construction and repair of fuel-oil storage and piping systems. The storage of fuel oil and flammable and combustible liquids shall be in accordance with Chapters 6 and 57 of the International Fire Code.

1301.2 Storage and piping systems. Fuel-oil storage systems shall comply with Section 603.3 of the International Fire Code. Fuel-oil piping systems shall comply with the requirements of this code.

1301.3 Fuel type. An appliance shall be designed for use with the type of fuel to which it will be connected. Such appliance shall not be converted from the fuel specified on the rating plate for use with a different fuel without securing reapproval from the code official.

Revise as follows:

1301.4 Fuel tanks, piping<u>, fittings</u> and valves. The tank, piping<u>, fittings</u> and valves for appliances burning oil shall be installed in accordance with the requirements of this chapter. Where an oil burner is served by a tank, any part of which is above the level of the burner inlet connection and where the fuel supply line is taken from the top of the tank, an approved antisiphon valve or other siphon-breaking device shall be installed in lieu of the shutoff valve.

1301.5 Tanks abandoned or removed. All exterior above-grade fill piping shall be removed when tanks are abandoned or removed. Tank abandonment and removal shall be in accordance with Section 5704.2.13 of the International Fire Code.

SECTION 1302
MATERIAL

1302.1 General. Piping materials shall conform to the standards cited in this section.

1302.2 Rated for system. All materials shall be rated for the operating temperatures and pressures of the system, and shall be compatible with the type of liquid.

TABLE 1302.3
FUEL OIL PIPING AND FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Copper or copper-alloy pipe and fittings	ASTM B42; ASTM B43; ASTM B302; ASTM F3226
Copper or copper-alloy tubing and fittings (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280; ASME B16.51; ASTM F3226
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel and Stainless Steel pipe and fittings	ASTM A53; ASTM A106; ASTM A312; ASTM F3226
Steel and Stainless Steel tubing and fittings	ASTM A254; ASTM A539; ASTM A269; ASTM F3226

1302.3 Pipe standards. Fuel oil pipe shall comply with one of the standards listed in Table 1302.3.

1302.4 Nonmetallic pipe. Nonmetallic pipe shall be listed and labeled as being acceptable for the intended application for flammable and combustible liquids. Nonmetallic pipe shall be installed only outdoors, underground.

1302.5 Fittings and valves. Fittings and valves shall be approved for the piping systems, and shall be compatible with, or shall be of the same material as, the pipe or tubing.

1302.6 Bending of pipe. Pipe shall be approved for bending. Pipe bends shall be made with approved equipment. The bend shall not exceed the structural limitations of the pipe.

1302.7 Pumps. Pumps that are not part of an appliance shall be of a positive-displacement type. The pump shall automatically shut off the supply when not in operation. Pumps shall be listed and labeled in accordance with UL 343.

1302.8 Flexible connectors and hoses. Flexible connectors and hoses shall be listed and labeled in accordance with UL 536.

SECTION 1303
JOINTS AND CONNECTIONS

1303.1 Approval. Joints and connections shall be approved and of a type approved for fuel-oil piping systems. Threaded joints and connections shall be made tight with suitable lubricant or pipe compound. Unions requiring gaskets or packings, right or left couplings, and sweat fittings employing solder having a melting point of less than 1,000°F (538°C) shall not be used in oil lines. Cast-iron fittings shall not be used. Joints and connections shall be tight for the pressure required by test.

1303.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved adapter fittings. Joints between different metallic piping materials shall be made with approved dielectric fittings or copper-alloy converter fittings.

1303.2 Preparation of pipe ends. Pipe shall be cut square, reamed and chamfered and be free from all burrs and obstructions. Pipe ends shall have full-bore openings and shall not be undercut.

1303.3 Joint preparation and installation. Where required by Sections 1303.4 through 1303.9, the preparation and installation of brazed, mechanical, threaded, press-connect and welded joints shall comply with Sections 1303.3.1 through ~~1303.3.4.~~ 1303.3.5.

1303.3.1 Brazed joints. All joint surfaces shall be cleaned. An approved flux shall be applied where required. The joints shall be brazed with a filler metal conforming to AWS A5.8.

1303.3.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. ~~Press-connect joints shall conform to one of the standards listed in Table 1302.3.~~

1303.3.3 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

1303.3.4 Welded joints. All joint surfaces shall be cleaned by an approved procedure. The joint shall be welded with an approved filler metal.

<u>**1303.3.5 Press-Connect joints.** Press-Connect joints shall be installed in accordance with the manufacturer's instructions and shall conform to one of the standards listed in Table 1302.3.</u>

1303.4 Copper or copper-alloy pipe. Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, threaded<u>, press-connect</u> or welded joints complying with Section 1303.3.

1303.5 Copper or copper-alloy tubing. Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical ~~joints complying with Section 1303.3~~, <u>or</u> press-connect joints ~~that conform to one of the standards in Table 1302.3 or flared joints. Flared joints shall be made by a tool designed for that operation~~ <u>complying with Section 1303.3</u>.

1303.6 Nonmetallic pipe. Joints between nonmetallic pipe or fittings shall be installed in accordance with the manufacturer's instructions for the labeled pipe and fittings.

1303.7 Steel <u>and Stainless Steel</u> pipe. Joints between steel <u>or stainless steel</u> pipe or fittings shall be threaded<u>, press-connect</u> or welded joints complying with Section 1303.3 or mechanical joints complying with Section 1303.7.1.

1303.7.1 Mechanical joints. Joints shall be made with an approved elastomeric seal. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall be installed outdoors, underground, unless otherwise approved.

1303.8 Steel <u>and Stainless Steel</u> tubing. Joints between steel <u>or stainless steel</u> tubing or fittings shall be mechanical<u>, press-connect</u> or welded joints complying with Section 1303.3.

1303.9 Piping protection. Proper allowance shall be made for expansion, contraction, jarring and vibration. Piping other than tubing, connected to underground tanks, except straight fill lines and test wells, shall be provided with flexible connectors, or otherwise arranged to permit the tanks to settle without impairing the tightness of the piping connections.

Add new standard(s) as follows:

ASTM

<u>A269-15:</u>	<u>Standard Specification f or Seamless and Welded Austenitic Stainless Steel Tubing f or General Service</u>
<u>A312-17:</u>	<u>Standard Specification f or Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes</u>
<u>F3226-16:</u>	<u>Standard Specif ication f or Metallic Press-Connect Fittings f or Piping and T ubing Systems</u>

Reason: ***Revisions for Chapter 13 have been included in one proposal for better discussion. Reason Statements will be provided under each Section number with proposed revisions.****

Section 1301.4-proposed to include fittings in this section for consistency throughout the chapter.

Table 1302.3-Proposed revisions to this table include updating the Title to include both Pipe and Fittings. Currently fitting standards exist in this table. The proposed table revision includes the addition of ASTM F3226 (Press-connect fitting standard

for copper, steel and stainless steel) which was recently published. ASTM A269 (stainless steel tubing standard) which is referenced in NFPA 31 and is recognized as acceptable for use in heating oil piping. Stainless steel tubing has been requested to be used due to its corrosion resistance properties. ASTM A312 (stainless steel pipe) is referenced for use in CSA B139 Installation code for Oil Burning Equipment.
Section 1303.3- this section adds press-connect joints in a new subsection 1303.3.5 and revises the section to state joints shall comply with sections 1303.3.1 through 1303.3.5.
Section 1303.3.2-Press-Connect joints have their own definition in the Chapter 2 of International Mechanical Code and needs to be uniquely identified from that of a Mechanical joint. The Mechanical Joint Definition does not exclude press-connect joints, but they are not listed under examples as types of joints see Chapter 2 definition below:

MECHANICAL JOINT.

1. A connection between pipes, fittings, or pipes and fittings that is not welded, brazed, caulked, soldered, solvent cemented or heat fused.
2. A general form of gas or liquid-tight connections obtained by the joining of parts through a positive holding mechanical construction such as, but not limited to, flanged, screwed, clamped or flared connections.

Section 1303.3.5-Press-Connect joints have their own definition in the Chapter 2 of International Mechanical Code and needs to be uniquely identified from that of a Mechanical joint.

PRESS-CONNECT JOINT. A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacture.

Section 1303.4- this revision adds press-connect joints to acceptable copper or copper alloy pipe. The standard for press-connect fittings for use with copper or copper alloy pipe is ASTM F3226 which is included in Table 1302.2.

Section 1303.5- this proposed revision cleans up unnecessary language. All of the recognized joints are listed in subsections 1303.3.1 through 1303.3.5.The removal of the language referring press-connect joints to Table 1302.3 and is not needed as this is the requirement under Section 1303.3 Joint preparation and installation. Flared fittings are included in the definition of Mechanical joints and do not need to be specifically identified in this section. See definition of Mechanical Joint below:

MECHANICAL JOINT.

1. A connection between pipes, fittings, or pipes and fittings that is not welded, brazed, caulked, soldered, solvent cemented or heat fused.
2. A general form of gas or liquid-tight connections obtained by the joining of parts through a positive holding mechanical construction such as, but not limited to, flanged, screwed, clamped or flared connections.

Section 1303.7-Stainless steel pipe is suitable for use in these systems and referenced as an acceptable piping material in CSA B139 Installation of Oil Fired Equipment Code section 5.2.1.2. This material has been specified due to its corrosion resistance properties.

Section 1303.8-NFPA 31 section 8.2.2.1 currently allows the use of stainless steel tubing. Stainless steel tubing is being specified on projects due to its corrosion-resistance properties and its compatibility as a piping material for fuel oil. Press-connect fittings are made for stainless steel piping and tubing and are already referenced in Chapter 13 of this code. Table 1302.3 has been proposed to be updated to add the stainless steel tubing and press-connect fitting standards ASTM A269 and ASTM F3226.

Chapter 15 Reference Standards- The standards proposed in Table 1302.3 that are not currently listed in Chapter 15 have been proposed to be added:

ASTM A269-15
Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

ASTM A312-17
Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

ASTM F3226-16
Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction.

These proposals provide an alternative to the existing pipe joining methods. The standards listed for Press-Connect type joints and stainless steel pipe are based on the alloys used and again are optional. No existing metallic alloys or joining methods are being removed as a result there are not costs associated with the proposed changes.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

1302.8 Flexible connectors and hoses. Flexible connectors and hoses shall be listed and labeled as being acceptable for the intended application for flammable and combustible liquids ~~in accordance with UL 536~~.

UL
~~536-97: Flexible Metallic Hose with revisions through December 2014~~

Committee Reason: Approval was based on the proponent's published reason statement. The modification deletes an irrelevant standard in Section 1302.8. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M121-18	**AM**

M8550/M127-18

Date Submitted	2/5/2021	**Section**	1402.8.1.2	**Proponent**	Mo Madani
Chapter	14	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **Yes**

Related Modifications

Summary of Modification

This code change clarifies that roof mounted solar collectors, the supports between the collectors and the roof (for example, sleepers, curbs and stanchions), and the attachments to the roof are required to be of non-combustible materials or FRT wood

Rationale

This code change clarifies that roof mounted solar collectors, the supports between the collectors and the roof (for example, sleepers, curbs and stanchions), and the attachments to the roof are required to be of non-combustible materials or FRT wood. The current text could be misinterpreted to mean that the entire roof assembly supporting the collectors and associated equipment, even if allowed to be of combustible materials by other provisions of the code, needs to be noncombustible materials or FRT which is not the case.

Comment Period History

M8550-G1

Proponent Michael Silvers (FRSA **Submitted** 6/16/2021 **Attachments** No

Comment:

FRSA request a Motion to Approve: FRSA urges the TAC to approve the provision of this Mod in the TAC's recommendations to the Commission and that it should be incorporated into the FBC.

Approved as Modified

Original Proposal:

2018 International Mechanical Code

Revise as follows:

1402.8.1.2 Rooftop-mounted solar thermal collectors and systems. The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Where mounted on or above the roof covering, the collector array ~~and supporting construction~~ , stanchions and their attachments to the roof shall be constructed of noncombustible materials or fire-retardant-treated wood conforming to the International Building Code to the extent required for the type of roof construction of the building to which the collectors are accessory.

Modified Proposal:

1402.8.1.2 Rooftop-mounted solar thermal collectors and systems. The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Where mounted on or above the roof covering, the collector array, ~~stanchions~~ mounting systems and their attachments to the roof shall be constructed of noncombustible materials or fire-retardant-treated wood conforming to the International Building Code to the extent required for the type of roof construction of the building to which the collectors are accessory.

Code Change No: M127-18

Original Proposal

Section(s): 1402.8.1.2

Proponents: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov); Angela Haupt (AHaupt@kirklandwa.gov)

2018 International Mechanical Code

Revise as follows:

1402.8.1.2 Rooftop-mounted solar thermal collectors and systems. The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Where mounted on or above the roof covering, the collector array ~~and supporting construction~~ , stanchions and their attachments to the roof shall be constructed of noncombustible materials or fire-retardant-treated wood conforming to the International Building Code to the extent required for the type of roof construction of the building to which the collectors are accessory.

Reason: This code change clarifies that roof mounted solar collectors, the supports between the collectors and the roof (for example, sleepers, curbs and stanchions), and the attachments to the roof are required to be of non-combustible materials or FRT wood. The current text could be misinterpreted to mean that the entire roof assembly supporting the collectors and associated equipment, even if allowed to be of combustible materials by other provisions of the code, needs to be noncombustible materials or FRT which is not the case.

Cost Impact: The code change proposal will not increase or decrease the cost of construction Clarification only.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

1402.8.1.2 Rooftop-mounted solar thermal collectors and systems. The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Where mounted on or above the roof covering, the collector array, ~~stanchions~~ mounting systems and their attachments to the roof shall be constructed of noncombustible materials or fire-retardant-treated wood conforming to the International Building Code to the extent required for the type of roof construction of the building to which the collectors are accessory.

Committee Reason: Approval was based on the proponent's published reason statement. The modification replaced the not well understood term, "stanchions." (Vote 8-3)

Assembly Action: **None**

Final Hearing Results

M127-18	**AM**

M8551/M128-18

Date Submitted	2/5/2021	**Section**	1404.1	**Proponent**	Mo Madani
Chapter	14	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Summary of Modification

The current language is inconsistent with labeling requirements of SRCC OG-100 labels. The proposed revision is to change the language to be consistent with SRCC OG-100 labels

Rationale

: The current language is inconsistent with labeling requirements of SRCC OG-100 labels. The proposed revision is to change the language to be consistent with SRCC OG-100 labels.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1404.1 Collectors. Factory-built solar thermal collectors shall bear a label showing the manufacturer's name and ~~address, model number and~~ serial number or certification number.

Code Change No: M128-18

Original Proposal

Section(s): 1404.1

Proponents: Joseph Cain, Solar Energy Industries Association (SEIA), representing Solar Energy Industries Association (JoeCainPE@gmail.com)

2018 International Mechanical Code

Revise as follows:

1404.1 Collectors. Factory-built solar thermal collectors shall bear a label showing the manufacturer's name and ~~address, model number and~~ serial number or certification number.

Reason: The current language is inconsistent with labeling requirements of SRCC OG-100 labels. The proposed revision is to change the language to be consistent with SRCC OG-100 labels.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal includes editorial changes only.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 8-3)

Assembly Action: **None**

Final Hearing Results

M128-18	**AS**

M9289/RM1-18

Date Submitted 2/23/2021
Chapter 2
Section 202
Affects HVHZ Yes
Proponent Mo Madani
Attachments Yes
TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review
Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

21, 202

Summary of Modification

Adds the definition of "Press-connect joint"

Rationale

Currently the IRC does not include the definition of Press-Connect Joint which is used in the text of the code in IRC section M2103.3. Including this definition will align the definitions as similarly provided for in the IMC and IPC.

Approved as Submitted (AS)

CHAPTER 21
HYDRONIC PIPING

Add new definition as follows:

PRESS-CONNECT JOINT. A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip or bite ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.

Code Change No: RM1-18

Original Proposal

Section(s): 21, 202

Proponents: Mark Fasel, representing Viega LLC (mark.fasel@viega.us)

2018 International Residential Code

CHAPTER 21
HYDRONIC PIPING

Add new definition as follows:

PRESS-CONNECT JOINT. A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip or bite ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.

Reason: Currently the IRC does not include the definition of Press-Connect Joint which is used in the text of the code in IRC section M2103.3. Including this definition will align the definitions as similarly provided for in the IMC and IPC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposed definition will not increase or decrease cost of construction as it defines a pipe joining method already referenced in the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM1-18	**AS**

M8463/RB3-18

Date Submitted 2/4/2021	**Section** 303	**Proponent** Mo Madani
Chapter 3	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

Summary of Modification

This proposed change would reintroduce the option for room-based mechanical ventilation systems, which are especially useful for additions or remodels.

Rationale

Prior to 2012, this section permitted users to specify "mechanical ventilation systems capable of producing 0.35 air changes per hour" or whole-house mechanical ventilation systems where an openable area of at least 4% of the habitable room's floor area is not provided. This proposed change would reintroduce the option for room-based mechanical ventilation systems, which are especially useful for additions or remodels. The proposed change is also consistent with Chapter 15's recognition that kitchens have different ventilation requirements than other habitable rooms. Namely, local exhaust, not whole-house mechanical ventilation that could be located in a far corner of the house, is needed for kitchens to ensure that cooking pollutants generated in the kitchen are captured and exhausted at their source. This language clarifies that IF the builder chooses to not provide the minimum openable glazing area in a kitchen, the kitchen shall be provided with ducted local exhaust in compliance with Chapter 15.
If approved, this change will provide more flexibility and can introduce cost savings for builders and buyers.

Comment Period History

M8463-G1

Proponent Alan Gremillion **Submitted** 6/24/2021 **Attachments** No

Comment:

If a window will now satisfy this code requirement and we can eliminate kitchen ventilation to the exterior, then this will decrease the cost of construction. Cost decrease = $150
If we are now required to run kitchen exhaust to the exterior in lieu of recirculation ventilation, then this will increase construction cost. Cost Increase = $150

Comment Period History

M8463-G2

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests approval of this code change. The change provides flexibility by adding options for habitable rooms where openable natural ventilation of 4% cannot be provided. The change does not establish a requirement for mechanical ventilation as natural ventilation may still be used

AM As Modified

R303.1 Habitable rooms. Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.

Exceptions:

1. ~~The~~ For habitable rooms other than kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.

2. For kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a local exhaust system is installed in accordance with Section M1505. Where the openable glazing area is less than 4 percent of the kitchen floor area, ductless kitchen exhaust shall not be permitted.

~~2~~3. The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

~~3~~4. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural ventilation if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

Committee Modification:

R303.1 Habitable rooms. Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.

Exceptions:

1. For habitable rooms other than kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.

2. For kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a local exhaust system is installed in accordance with Section M1505. ~~Where the openable glazing area is less than 4 percent of the kitchen floor area, ductless kitchen exhaust shall not be permitted.~~

3. The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

4. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural ventilation if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

Committee Reason: Approval was based on the proponent's published reason statement. The modification will still allow ductless hoods. (Vote 10-0)

Code Change No: RB3-18

Original Proposal

Section(s): R303.1

Proponents: Mike Moore, Newport Ventures, representing Broan-NuTone (mmoore@newportventures.net)

2018 International Residential Code

R303.1 Habitable rooms. Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.

Exceptions:

1. ~~The~~ For habitable rooms other than kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.
2. For kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a local exhaust system is installed in accordance with Section M1505. Where the openable glazing area is less than 4 percent of the kitchen floor area, ductless kitchen exhaust shall not be permitted.

~~2~~3. The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

~~3~~4. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural ventilation if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

Reason: Prior to 2012, this section permitted users to specify "mechanical ventilation systems capable of producing 0.35 air changes per hour" or whole-house mechanical ventilation systems where an openable area of at least 4% of the habitable room's floor area is not provided. This proposed change would reintroduce the option for room-based mechanical ventilation systems, which are especially useful for additions or remodels. The proposed change is also consistent with Chapter 15's recognition that kitchens have different ventilation requirements than other habitable rooms. Namely, local exhaust, not whole-house mechanical ventilation that could be located in a far corner of the house, is needed for kitchens to ensure that cooking pollutants generated in the kitchen are captured and exhausted at their source. This language clarifies that IF the builder chooses to not provide the minimum openable glazing area in a kitchen, the kitchen shall be provided with ducted local exhaust in compliance with Chapter 15.

If approved, this change will provide more flexibility and can introduce cost savings for builders and buyers.

Cost Impact: The code change proposal will decrease the cost of construction
This change adds options that can reduce cost and clarifies that if a kitchen range hood is installed in lieu of natural ventilation, the kitchen range hood shall be ducted to the exterior.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Committee Modification:

R303.1 Habitable rooms. Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.

Exceptions:

1. For habitable rooms other than kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.
2. For kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a local exhaust system is installed in accordance with Section M1505. ~~Where the openable glazing area is less than 4 percent of the kitchen floor area, ductless kitchen exhaust shall not be permitted.~~
3. The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
4. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural ventilation if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

Committee Reason: Approval was based on the proponent's published reason statement. The modification will still allow ductless hoods. (Vote 10-0)

Assembly Action: **None**

Final Action

RB3-18	AM

M8951/RB284-19

Date Submitted 2/12/2021	**Section** 1001.13	**Proponent** Mo Madani
Chapter 10	**Affects HVHZ** No	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Chapter 44

Summary of Modification

This proposal aligns the masonry fireplace requirements in the IRC with the masonry fireplace requirements in the IMC, Section 902.2.

Rationale

This proposal aligns the masonry fireplace requirements in the IRC with the masonry fireplace requirements in the IMC, Section 902.2.

ORIGINAL
AS - APPROVED AS SUBMITTED

Add new text as follows:

R1001.13 Fireplace accessories.*Listed* and *labeled* fireplace accessories shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Fireplace accessories shall comply with UL 907.

Add new standard(s) as follows:

UL
UL 907-94: Fireplace Accessories - with revisions through November 2014

Code Change No: RB284-19

Original Proposal

Section(s): R1001.13(New), UL Chapter 44 (New)

Proponent: Jonathan Roberts, representing UL LLC (jonathan.roberts@ul.com)

2018 International Residential Code

Add new text as follows:

R1001.13 Fireplace accessories. *Listed* and *labeled* fireplace accessories shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Fireplace accessories shall comply with UL 907.

Add new standard(s) as follows:

UL
UL 907-94: Fireplace Accessories - with revisions through November 2014

Reason: This proposal aligns the masonry fireplace requirements in the IRC with the masonry fireplace requirements in the IMC, Section 902.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only requires that if listed and labeled fireplace accessories are used, they shall be installed in accordance with the manufacturer's installation instructions and be listed in accordance with UL 907.

Staff Analysis: The referenced standard, UL 907-94, is currently referenced in other 2018 I-codes.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The proposal appropriately aligns the masonry fireplace requirements with IMC Section 902.2. (Vote: 7-3)

Assembly Action: **None**

Final Action

RB284-19	AS

M9292/RM3-18

Date Submitted 2/24/2021	**Section** 1307.7	**Proponent** Mo Madani
Chapter 13	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

M1307.7

Summary of Modification

Adds the "prohibited support" which states that shall not be used as a support base under an appliance.

Rationale

If appliances are installed resting on gypsum board, the board can compress, degrade from heat, moisture and vibration and crumble, with the result being movement and settling of the appliance which would put stress on gas piping, vent connectors, chimney connectors, electrical connections and ductwork. Gypsum board is not intended to be a support base for vertical deadloads.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as submitted (AS)

Add new text as follows:

M1307.7 Prohibited support. Gypsum board shall not be used as a support base under an appliance.

Code Change No: RM3-18

Original Proposal

Section(s): M1307.7 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Add new text as follows:

M1307.7 **Prohibited support.** Gypsum board shall not be used as a support base under an appliance.

Reason: If appliances are installed resting on gypsum board, the board can compress, degrade from heat, moisture and vibration and crumble, with the result being movement and settling of the appliance which would put stress on gas piping, vent connectors, chimney connectors, electrical connections and ductwork. Gypsum board is not intended to be a support base for vertical deadloads.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The support of appliances is already covered in the code. (Vote 6-3)

Assembly Action: **None**

Final Action

RM3-18	AS

M9293/RM9-18

Date Submitted 2/24/2021	**Section** 1411.3.1.2	**Proponent** Mo Madani
Chapter 14	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

M1411.3.1.2 (New)

Summary of Modification

Adds the section to make the IRC consistent with the other codes.

Rationale

This is editorial in nature and is missing from this code. This can be found in the IMC Section 307.2.3.2 and in the IPC. This addition will make the IRC consistent with the other codes.

Comment Period History

M9293-G1

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change.

Approved as submitted (AS)

Add new text as follows:

<u>M1411.3.1.2 Appliance, equipment and insulation in pans. Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, that portion of the appliance, equipment and insulation shall be installed above the rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant and approved.</u>

Code Change No: RM9-18

Original Proposal

Section(s): M1411.3.1.2 (New)

Proponents: Guy McMann, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Residential Code

Add new text as follows:

M1411.3.1.2 Appliance, equipment and insulation in pans. Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, that portion of the appliance, equipment and insulation shall be installed above the rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant and approved.

Reason: This is editorial in nature and is missing from this code. This can be found in the IMC Section 307.2.3.2 and in the IPC. This addition will make the IRC consistent with the other codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This is consistent with the IMC requirements. The appliances need to be protected regardless of their location in residential or commercial. (Vote 8-2)

Assembly Action: **None**

Final Action

RM9-18	**AS**

M8609/M53-18 Part II

Date Submitted 2/8/2021	**Section** 1502.4.5	**Proponent** Mo Madani
Chapter 15	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

This change is being proposed for clarity to distinguish between old style booster fans and dryer exhaust duct power ventilators (DEDPV

Rationale

This change is being proposed for clarity to distinguish between old style booster fans and dryer exhaust duct power ventilators (DEDPV). UL 2158 (electric dryer standard) and ANSI Z21.5.1/CSA 7.1 (gas dryer standard) prohibit domestic dryers from connecting to dryer exhaust systems having booster fans. The warning required to be included in the installation instructions by both standards reads, “WARNING: Risk of Fire. Do not install a booster fan in the exhaust duct.”

Booster fans were a class of ventilators that were installed before the introduction of dryer exhaust duct power ventilators or DEDPVs. DEDPV are regulated by UL 705, whereas old style booster fans where not specifically addressed in any UL standard. DEDPVs are not impacted by this change since Section 504.5 in the Mechanical Code and Section M1502.4.4 of the Residential Code permit the installation and use of DEDPVs.

Approved as Submitted (AS)

2018 International Residential Code

Add new text as follows:

M1502.4.5 Booster fans prohibited. Domestic booster fans shall not be installed in dryer exhaust systems.

Code Change No: M53-18 Part II

Original Proposal

Section(s): M1502.4.5 (New)

Proponents: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Systemair (JBEngineer@aol.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IMC COMMITTEE AND PART II WILL BE HEARD BY THE IRC M/P COMMITTEE. PLEASE SEE THE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Residential Code

Add new text as follows:

M1502.4.5 Booster fans prohibited. Domestic booster fans shall not be installed in dryer exhaust systems.

Reason: This change is being proposed for clarity to distinguish between old style booster fans and dryer exhaust duct power ventilators (DEDPV). UL 2158 (electric dryer standard) and ANSI Z21.5.1/CSA 7.1 (gas dryer standard) prohibit domestic dryers from connecting to dryer exhaust systems having booster fans. The warning required to be included in the installation instructions by both standards reads, *"WARNING: Risk of Fire. Do not install a booster fan in the exhaust duct."*

Booster fans were a class of ventilators that were installed before the introduction of dryer exhaust duct power ventilators or DEDPVs. DEDPV are regulated by UL 705, whereas old style booster fans where not specifically addressed in any UL standard. DEDPVs are not impacted by this change since Section 504.5 in the Mechanical Code and Section M1502.4.4 of the Residential Code permit the installation and use of DEDPVs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The change only clarifies current code requirements.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 9-0)

Assembly Action: **None**

Final Hearing Results

M53-18 Part II	**AS**

M9331/RM13-18

Date Submitted	2/24/2021	**Section**	1502.3	**Proponent**	Mo Madani
Chapter	15	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **Yes**

Related Modifications

M1502.3

Summary of Modification

Addresses ventilated soffits as building openings

Rationale

The code does not address ventilated soffits as building openings, which indeed they are.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Comment Period History

M9331-G1

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change.

Approved as submittedd (AS)

Revise as follows:

M1502.3 Duct termination. Exhaust ducts shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. If the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings <u>including openings in ventilated soffits.</u> Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination.

Code Change No: RM13-18

Original Proposal

Section(s): M1502.3

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

M1502.3 Duct termination. Exhaust ducts shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. If the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings <u>including openings in ventilated soffits.</u> Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination.

Reason: The code does not address ventilated soffits as building openings, which indeed they are.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 8-1)

Assembly Action: **None**

Final Action

RM13-18	AS

M9333/RM23-18

Date Submitted	2/24/2021	**Section**	1505.4.4	**Proponent**	Mo Madani
Chapter	15	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

TABLE M1505.4.4

FBC-R/Table 1507.4

Summary of Modification

Adds a footnote to table M1505.4.4

Rationale

To ensure that exhaust fans provide the minimum CFM required by the IRC, the IRC was amended in recent cycles to require prescriptive duct sizing for exhaust rates taken at a static pressure of 0.25 inch water column (see Table M1504.2). For consistency, this change will align the flow rate requirements of Table 1505.4.4 with the duct sizing requirements of Table M1504.2 and the equipment listing requirements of Section M1505.3.

Approved as submtted (AS)

2018 International Residential Code

Revise as follows:

TABLE M1505.4.4
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES[a]
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.

a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch wc in accordance with Section M1505.3.

Code Change No: RM23-18

Original Proposal

Section(s): TABLE M1505.4.4

Proponents: Mike Moore, representing Broan-NuTone (mmoore@newportventures.net)

2018 International Residential Code

Revise as follows:

TABLE M1505.4.4
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES[a]
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.
a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch wc in accordance with Section M1505.3.

Reason: To ensure that exhaust fans provide the minimum CFM required by the IRC, the IRC was amended in recent cycles to require prescriptive duct sizing for exhaust rates taken at a static pressure of 0.25 inch water column (see Table M1504.2). For consistency, this change will align the flow rate requirements of Table 1505.4.4 with the duct sizing requirements of Table M1504.2 and the equipment listing requirements of Section M1505.3.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The prescriptive duct sizing requirements of M1504.2 require that ducts be sized for flows taken at 0.25 in w.c. in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51. Because this change is a simple clarification of existing requirements, no change to construction cost is expected.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM23-18 **AS**

M9337/RM32-18

Date Submitted	2/24/2021	**Section**	1601.1.1	**Proponent**	Mo Madani
Chapter	16	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

M1601.1.1, M1601.4.5

Summary of Modification

This proposal is a cleanup of of text

Rationale

The current text creates an unnecessary step by taking the reader to R602.8, only to be redirected to R302.11.1. This proposal is a nontechnical cleanup of text.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input

Approved as Submitted (AS)

Revise as follows:

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to not greater than 250°F (121°C).
2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions.
3. Fibrous glass duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC Duct Construction Standards~~—~~—Metal and Flexible except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A653.
5. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. Duct systems shall be constructed of materials having a flame spread index of not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   - 7.1. These cavities or spaces shall not be used as a plenum for supply air.
   - 7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   - 7.3. Stud wall cavities shall not convey air from more than one floor level.
   - 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section ~~R602.8.~~R302.11. Fireblocking materials used for isolation shall comply with Section R302.11.1.
   - 7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.
8. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing shall be provided with access.

M1601.4.5 Fireblocking. Duct installations shall be fireblocked in accordance with Section ~~R602.8~~ R302.11.

Code Change No: RM32-18

Original Proposal

Section(s): M1601.1.1, M1601.4.5

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to not greater than 250°F (121°C).
2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions.
3. Fibrous glass duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC Duct Construction Standards~~-~~—Metal and Flexible except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A653.
5. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. Duct systems shall be constructed of materials having a flame spread index of not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   7.1. These cavities or spaces shall not be used as a plenum for supply air.
   7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   7.3. Stud wall cavities shall not convey air from more than one floor level.
   7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section ~~R602.8.~~<u>R302.11. Fireblocking materials used for isolation shall comply with Section R302.11.1.</u>
   7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.
8. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing shall be provided with access.

M1601.4.5 Fireblocking. Duct installations shall be fireblocked in accordance with Section ~~R602.8~~ <u>R302.11</u>.

Reason: The current text creates an unnecessary step by taking the reader to R602.8, only to be redirected to R302.11.1. This proposal is a nontechnical cleanup of text.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction

This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. This makes code easier to read. (Vote 10-0)

Assembly Action: **None**

Final Action

RM32-18	**AS**

Date Submitted 2/24/2021	**Section** 1802.4	**Proponent** Mo Madani
Chapter 16	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

M1802.4 (New)

Summary of Modification

Adds new section "Blocked Vent Switch"

Rationale

Such devices can save lives in the event that a chimney or Type L vent is blocked by debris, decaying masonry or dead animals. Gas furnaces are equipped with thermal and/or pressure devices that will sense failure of the venting system, but such is not known to be required for oil-fired appliances. Such devices have been installed for many decades, but not necessarily required. These devices are typically provided for or are an option for draft regulators that are commonly installed in the vent of oil-flred appliances.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Comment Period History

M9339-G1

Proponent Alan Gremillion **Submitted** 6/25/2021 **Attachments** No

Comment:

The change will increase the cost of construction. Unfortunately, oil-fired appliances are not common in the Florida market, so we were not able to find any contractors or distributors to provide pricing for a blocked vent automatic burner shutoff switch.

Approved as Modified (AM)

Original MOD

Add new text as follows:

M1802.4 Blocked vent switch. The venting system for oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset and shall be installed in accordance with the manufacturer's instructions.

Committee Action: Approved as Modified

Modify proposal as follows:

M1802.4 Blocked vent switch. ~~The venting system for oil~~ Oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.

Code Change No: RM34-18

Original Proposal

Section(s): M1802.4 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Add new text as follows:

M1802.4 Blocked vent switch. The venting system for oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset and shall be installed in accordance with the manufacturer's instructions.

Reason: Such devices can save lives in the event that a chimney or Type L vent is blocked by debris, decaying masonry or dead animals. Gas furnaces are equipped with thermal and/or pressure devices that will sense failure of the venting system, but such is not known to be required for oil-fired appliances. Such devices have been installed for many decades, but not necessarily required. These devices are typically provided for or are an option for draft regulators that are commonly installed in the vent of oil-fired appliances.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction because an additional device is mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify proposal as follows:

M1802.4 Blocked vent switch. ~~The venting system for oil~~ Oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.

Committee Reason: Approval was based on the proponent's published reason statement. The modification clarifies that this requirement relates to the appliance, not the vent system. (Vote 9-0)

Assembly Action: **None**

Final Action

RM34-18	AM

M8545/M119-18 Part II

Date Submitted 2/5/2021	**Section** 2103.1	**Proponent** Mo Madani
Chapter 21	**Affects HVHZ** Yes	**Attachments** Yes

TAC Recommendation Approved as Submitted – Consent
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modifies text of Section M2103.1 "Piping materials", modifying the psi rating of Hydronic heating systems.

Rationale

A 100 psi rating is not necessary in hydronic applications, particularly when the tubing is encased in a hard concrete or a gypsum material. Hydronic heating systems are typically designed with operating pressures of 12 psi – 20 psi, and these systems contain expansion tanks incorporated in them that are factory set to 12 psi. Safety relief valves on the boilers are typically set at 30 psi or 50 psi.

ASTM Standard F2623, “Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing”, states in Section 1.4, “The tubing produced under this specification shall be permitted for use in general fluid transport, including hydronics and irrigations systems.”

I believe the retention of 100 psi minimum was an oversight when ASTM F2623 PE-RT was added to Table 1202.4.

Approved as Submitted

2018 International Residential Code

M2103.1 Piping materials. Piping for embedment in concrete or gypsum materials shall be standard-weight steel pipe, copper and copper-alloy pipe and tubing, cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe, chlorinated polyvinyl chloride (CPVC), ~~polybutylene,~~ cross-linked polyethylene (PEX) tubing, polyethylene of raised temperature (PE-RT) or polypropylene (PP) with a rating of not less than ~~100~~ 80 psi at 180°F (~~690~~ 552 kPa at 82°C).

Code Change No: M119-18 Part II

Original Proposal

Section(s): M2103.1

Proponents: Chris Haldiman, representing Watts Water Technologies (chris.haldiman@wattswater.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IMC COMMITTEE AND PART II WILL BE HEARD BY THE IRC M/P COMMITTEE. PLEASE SEE THE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Residential Code

M2103.1 Piping materials. Piping for embedment in concrete or gypsum materials shall be standard-weight steel pipe, copper and copper-alloy pipe and tubing, cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe, chlorinated polyvinyl chloride (CPVC), ~~polybutylene,~~ cross-linked polyethylene (PEX) tubing, polyethylene of raised temperature (PE-RT) or polypropylene (PP) with a rating of not less than ~~100~~ 80 psi at 180°F (~~690~~ 552 kPa at 82°C).

Reason: A 100 psi rating is not necessary in hydronic applications, particularly when the tubing is encased in a hard concrete or a gypsum material. Hydronic heating systems are typically designed with operating pressures of 12 psi – 20 psi, and these systems contain expansion tanks incorporated in them that are factory set to 12 psi. Safety relief valves on the boilers are typically set at 30 psi or 50 psi.

ASTM Standard F2623, “Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing”, states in Section 1.4, “The tubing produced under this specification shall be permitted for use in general fluid transport, including hydronics and irrigations systems.”

I believe the retention of 100 psi minimum was an oversight when ASTM F2623 PE-RT was added to Table 1202.4.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on proponent's published reason statement. The revision aligns with the material standard. Boilers have 30 to 50 PSI relief valves to prevent higher pressures. (Vote 9-1)

Assembly Action: **None**

Final Hearing Results

M119-18 Part II AS

M9340/RM35-18

Date Submitted	2/25/2021	**Section**	2101.11	**Proponent**	Mo Madani
Chapter	21	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

M2101.11 (New), M2101.12 (New), M2101.13 (New), M2101.13.1 (New), M2101.14 (New), M2101.15 (New), M2101.15.1 (New), M2101.15.2 (New), M2101.16 (New), M2101.16.1 (New), M2101.17 (New), M2101.17.1 (New), M2101.17.2 (New), M2101.18 (New), M2101.18.1 (New), please see attachment

Summary of Modification

Adds new sections to fill a gap in the code coverage for hydronic piping

Rationale

This proposal fills a gap in the code coverage for hydronic piping. The new text is simply borrowed from Section M1205 which is specific to ground-source heat-pump loop piping. The same requirements also need to apply to all hydronic piping systems under Section M2101, not just ground-source heat- pump systems. This proposal provides the same coverage for general hydronic systems as is currently required for ground-source heat-pump systems.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as Modified (AM)

Original MOD

Add new text as follows:

M2101.11 Used materials. Used pipe, fittings, valves, and other materials shall not be reused in hydronic systems.

M2101.12 Material rating. Pipe and tubing shall be rated for the operating temperature and pressure of the system. Fittings shall be suitable for the pressure applications and recommended by the manufacturer for installation with the pipe and tubing material installed. Where used underground, materials shall be suitable for burial.

M2101.13 Joints and connections. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the system. Joints used underground shall be approved for such applications.

M2101.13.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

M2101.14 Preparation of pipe ends. Pipe shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

M2101.15 Joint preparation and installation. Where required by Sections M2101.16 through M2101.18, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections M2101.15.1 and M2101.15.2.

M2101.15.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

M2101.15.2 Thermoplastic-welded joints. Joint surfaces for thermoplastic-welded joints shall be cleaned by an approved procedure. Joints shall be welded in accordance with the manufacturer's instructions.

M2101.16 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented in accordance with Section P2906.9.1.2. Threaded joints between fittings and CPVC plastic pipe shall be in accordance with Section M2101.16.1.

M2101.16.1 Threaded joints. Threads shall conform to ASME B1.20.1 The pipe shall be Schedule 80 40 or heavier plastic pipe and shall be threaded with dies specifically designed for plastic pipe. Thread lubricant, pipe-joint compound or tape shall be applied on the male threads only and shall be approved for application on the piping material.

M2101.17 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall comply with Sections M2101.17.1 and M2101.17.2. Mechanical joints shall comply with Section M2101.15.1.

M2101.17.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

M2101.17.2 Plastic-to-metal. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to plastic pipe or tubing.

M2101.18 Polyethylene plastic pipe and tubing. Joints between polyethylene plastic pipe and tubing or fittings for systems shall be heat-fusion joints complying with Section M2101.18.1, electrofusion joints complying with Section M2101.18.2, or stab-type insertion joints complying with Section M2101.18.3.

M2101.18.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, and joined in accordance with ASTM D2657. Joint surfaces shall be clean and free from moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D2683 or ASTM D3261.

M2101.18.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free from moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F1055.

M2101.18.3 Stab-type insert fittings. Joint surfaces shall be clean and free from moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F1924.

M2101.19 Polyproplyene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Sections M2101.19.1 and M2101.19.2.

M2101.19.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt fusion. Joint surfaces shall be clean and free from moisture. The joint shall remain undisturbed until cool. Joints shall be made in accordance with ASTM F2389.

M2101.19.2 Mechanical and compression sleeve joints.Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

M2101.20 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall comply with Sections M2101.20.1 through M2101.20.4. Mechanical joints shall comply with Section M2101.15.1.

M2101.20.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

M2101.20.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe or tubing.

M2101.20.3 Heat-fusion joints. Heat-fusion joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, and shall be joined in accordance with ASTM D2657. Joint surfaces shall be clean and free from moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D2683 or ASTM D3261.

M2101.20.4 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free from moisture and scoured to exp0ose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F105.

M2101.21 PVC plastic pipe. Joints between PVC plastic pipe or fittings shall be solvent-cemented in accordance with Section P2906.9.1.4. Threaded joints between fittings and PVC plastic pipe shall be in accordance with Section M2101.16.1.

M2101.21 Shutoff valves. Shutoff valves shall be installed in ground-source loop piping systems in the locations indicated in Sections M2101.21.1 through M2101.21.6.

M2101.21.1 Heat exchangers. Shut off valves shall be installed on the supply and return side of a heat exchanger.

> **Exception:** Shutoff valves shall not be required where heat exchangers are integral with a boiler or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section M2001.3.

M2101.21.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

M2101.21.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

M2101.21.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

M2101.21.5 Equipment and appliances. `Shutoff valves shall be installed on connections to mechanical equipment and appliances. This requirement does not apply to components of ground-source loop systems such as pumps, air separators, metering devices, and similar equipment.

M2101.21.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

M2101.22 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section M2002.

M2101.23 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the manufacturer's instructions.

M2101.24 Protection of potable water. Where hydronic systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with Section P2902.

M2101.25 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with Section P2606.1.

M2101.26 Clearance from combustibles. A pipe in a piping system having an exterior surface temperature exceeding 250ºF (121ºC) shall have a clearance of not less than 1 inch (25 mm) from combustible materials.

M2101.27 Contact with building material. A piping system shall not be in direct contact with building materials that cause the piping or fitting material to degrade or corrode, or that interfere with the operation of the system.

M2101.28 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

M2101.28.1 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.

M2101.29 Chemical compatibility. Antifreeze and other materials used in the system shall be chemically compatible with the pipe, tubing, fittings and mechanical systems.

M2101.30 Makeup water. The transfer fluid shall be compatible with the makeup water supplied to the system.

Committee Action: Approved as Modified

Modify proposal as follows:

M2101.14 Preparation of pipe ends. Pipe shall be cut square~~, reamed~~, and shall be free of burrs and obstructions. ~~CPVC, PE, and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~ be prepared in accordance with the pipe manufacturer's instructions.

Code Change No: RM35-18

Original Proposal

Section(s): M2101.11 (New), M2101.12 (New), M2101.13 (New), M2101.13.1 (New), M2101.14 (New), M2101.15 (New), M2101.15.1 (New), M2101.15.2 (New), M2101.16 (New), M2101.16.1 (New), M2101.17 (New), M2101.17.1 (New), M2101.17.2 (New), M2101.18 (New), M2101.18.1 (New), M2101.18.2 (New), M2101.18.3 (New), M2101.19 (New), M2101.19.1 (New), M2101.19.2 (New), M2101.20 (New), M2101.20.1 (New), M2101.20.2 (New), M2101.20.3 (New), M2101.20.4 (New), M2101.21 (New), M2101.21.1 (New), M2101.21.2 (New), M2101.21.3 (New), M2101.21.4 (New), M2101.21.5 (New), M2101.21.6 (New), M2101.22 (New), M2101.23 (New), M2101.24 (New), M2101.25 (New), M2101.26 (New), M2101.27 (New), M2101.28 (New), M2101.28.1 (New), M2101.29 (New), M2101.30 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Add new text as follows:

M2101.11 Used materials. Used pipe, fittings, valves, and other materials shall not be reused in hydronic systems.

M2101.12 Material rating. Pipe and tubing shall be rated for the operating temperature and pressure of the system. Fittings shall be suitable for the pressure applications and recommended by the manufacturer for installation with the pipe and tubing material installed. Where used underground, materials shall be suitable for burial.

M2101.13 Joints and connections. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the system. Joints used underground shall be approved for such applications.

M2101.13.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

M2101.14 Preparation of pipe ends. Pipe shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

M2101.15 Joint preparation and installation. Where required by Sections M2101.16 through M2101.18, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections M2101.15.1 and M2101.15.2.

M2101.15.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

M2101.15.2 Thermoplastic-welded joints. Joint surfaces for thermoplastic-welded joints shall be cleaned by an approved procedure. Joints shall be welded in accordance with the manufacturer's instructions.

M2101.16 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented in accordance with Section P2906.9.1.2. Threaded joints between fittings and CPVC plastic pipe shall be in accordance with Section M2101.16.1.

M2101.16.1 Threaded joints. Threads shall conform to ASME B1.20.1 The pipe shall be Schedule 80 40 or heavier plastic pipe and shall be threaded with dies specifically designed for plastic pipe. Thread lubricant, pipe-joint compound or tape shall be applied on the male threads only and shall be approved for application on the piping material.

M2101.17 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall comply with Sections M2101.17.1 and M2101.17.2. Mechanical joints shall comply with Section M2101.15.1.

M2101.17.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

M2101.17.2 Plastic-to-metal. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to plastic pipe or tubing.

M2101.18 Polyethylene plastic pipe and tubing. Joints between polyethylene plastic pipe and tubing or fittings for systems shall be heat-fusion joints complying with Section M2101.18.1, electrofusion joints complying with Section M2101.18.2, or stab-type insertion joints complying with Section M2101.18.3.

M2101.18.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, and joined in accordance with ASTM D2657. Joint surfaces shall be clean and free from moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D2683 or ASTM D3261.

M2101.18.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free from moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F1055.

M2101.18.3 Stab-type insert fittings. Joint surfaces shall be clean and free from moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F1924.

M2101.19 Polyproplyene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Sections M2101.19.1 and M2101.19.2.

M2101.19.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt fusion. Joint surfaces shall be clean and free from moisture. The joint shall remain undisturbed until cool. Joints shall be made in accordance with ASTM F2389.

M2101.19.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

M2101.20 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall comply with Sections M2101.20.1 through M2101.20.4. Mechanical joints shall comply with Section M2101.15.1.

M2101.20.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

M2101.20.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe or tubing.

M2101.20.3 Heat-fusion joints. Heat-fusion joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, and shall be joined in accordance with ASTM D2657. Joint surfaces shall be clean and free from moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D2683 or ASTM D3261.

M2101.20.4 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free from moisture and scoured to exp0ose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F105.

M2101.21 PVC plastic pipe. Joints between PVC plastic pipe or fittings shall be solvent-cemented in accordance with Section P2906.9.1.4. Threaded joints between fittings and PVC plastic pipe shall be in accordance with Section M2101.16.1.

M2101.21 Shutoff valves. Shutoff valves shall be installed in ground-source loop piping systems in the locations indicated in Sections M2101.21.1 through M2101.21.6.

M2101.21.1 Heat exchangers. Shut off valves shall be installed on the supply and return side of a heat exchanger.

> **Exception:** Shutoff valves shall not be required where heat exchangers are integral with a boiler or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section M2001.3.

M2101.21.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

M2101.21.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

M2101.21.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

M2101.21.5 Equipment and appliances. `Shutoff valves shall be installed on connections to mechanical equipment and appliances. This requirement does not apply to components of ground-source loop systems such as pumps, air separators, metering devices, and similar equipment.

M2101.21.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

M2101.22 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section M2002.

M2101.23 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the manufacturer's instructions.

M2101.24 Protection of potable water. Where hydronic systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with Section P2902.

M2101.25 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with Section P2606.1.

M2101.26 Clearance from combustibles. A pipe in a piping system having an exterior surface temperature exceeding 250ºF (121ºC) shall have a clearance of not less than 1 inch (25 mm) from combustible materials.

M2101.27 Contact with building material. A piping system shall not be in direct contact with building materials that cause the piping or fitting material to degrade or corrode, or that interfere with the operation of the system.

M2101.28 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

M2101.28.1 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.

M2101.29 Chemical compatibility. Antifreeze and other materials used in the system shall be chemically compatible with the pipe, tubing, fittings and mechanical systems.

M2101.30 Makeup water. The transfer fluid shall be compatible with the makeup water supplied to the system.

Reason: This proposal fills a gap in the code coverage for hydronic piping. The new text is simply borrowed from Section M1205 which is specific to ground-source heat-pump loop piping. The same requirements also need to apply to all hydronic piping systems under Section M2101, not just ground-source heat- pump systems. This proposal provides the same coverage for general hydronic systems as is currently required for ground-source heat-pump systems.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify proposal as follows:

M2101.14 Preparation of pipe ends. Pipe shall be cut square~~, reamed~~, and shall be free of burrs and obstructions. ~~CPVC, PE, and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~ be prepared in accordance with the pipe manufacturer's instructions.

Committee Reason: Approval was based on the proponent's published reason statement. The modification makes the text apply to all materials without naming specific materials. Reaming and undercutting is for metal pipe. (Vote 9-0)

Assembly Action: **None**

Final Action

RM35-18 **AM**

M9341/RM36-18

Date Submitted 2/25/2021	**Section** 2105.4	**Proponent** Mo Madani
Chapter 21	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

TABLE M2105.4

Summary of Modification

Adds CSA C448 to Table M2105.4

Rationale

This proposal is on behalf of the International Ground Source Heat Pump Association (IGSHPA); Mark Metzner – President of IGSHPA Canada and the Chairman of ANSI/CSA/IGSHPA C448; and The Plastics Pipe Institute.

ANSI/CSA/IGSHPA C448-16 “Design and installation of ground source heat pump systems for commercial and residential buildings” is an ANSI designated bi-national consensus standard for the design and installation of ground source heat pump systems. It was first published in February 2016.

ANSI/CSA/IGSHPA C448-16 replaces the original version known as CSA C448-02. ANSI/CSA/IGSHPA C448-16 is a greatly enhanced system standard which includes the industry knowledge of ground source geothermal systems gained since 2002.

ANSI/CSA/IGSHPA C448-16 contains specific requirements for HDPE, PEX and PE-RT piping systems (pipe and fittings) for use as ground loop piping systems. By adding reference to C448 in these rows, this will indicate that these materials (PEX and PE-RT) are explicitly approved in ANSI/CSA/IGSHPA C448-16.

Approved as submitted (AS)

Revise as follows:

TABLE M2105.4

GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5; CSA C448
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18; CSA C448

Code Change No: RM36-18

Original Proposal

Section(s): TABLE M2105.4

Proponents: LANCE MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org); Mark Metzner, IGSHPA Canada, representing IGSHPA Canada (markmetzner@shaw.ca)

2018 International Residential Code

Revise as follows:

TABLE M2105.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5; CSA C448
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18; CSA C448

Reason: This proposal is on behalf of the International Ground Source Heat Pump Association (IGSHPA); Mark Metzner – President of IGSHPA Canada and the Chairman of ANSI/CSA/IGSHPA C448; and The Plastics Pipe Institute.

ANSI/CSA/IGSHPA C448-16 "Design and installation of ground source heat pump systems for commercial and residential buildings" is an ANSI designated bi-national consensus standard for the design and installation of ground source heat pump systems. It was first published in February 2016.

ANSI/CSA/IGSHPA C448-16 replaces the original version known as CSA C448-02. ANSI/CSA/IGSHPA C448-16 is a greatly enhanced system standard which includes the industry knowledge of ground source geothermal systems gained since 2002.

ANSI/CSA/IGSHPA C448-16 contains specific requirements for HDPE, PEX and PE-RT piping systems (pipe and fittings) for use as ground loop piping systems. By adding reference to C448 in these rows, this will indicate that these materials (PEX and PE-RT) are explicitly approved in ANSI/CSA/IGSHPA C448-16.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction because it is simply identifying another industry consensus standard (C448) to which existing materials PEX and PE-RT can comply.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM36-18	**AS**

M9346/RM38-18

Date Submitted	2/25/2021	**Section**	2105.5	**Proponent**	Mo Madani
Chapter	21	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

TABLE M2105.5

Summary of Modification

Adds CSA C448 to table M2105.5

Rationale

This proposal is on behalf of the International Ground Source Heat Pump Association (IGSHPA); Mark Metzner – President of IGSHPA Canada and the Chairman of ANSI/CSA/IGSHPA C448; and The Plastics Pipe Institute.

ANSI/CSA/IGSHPA C448-16 “Design and installation of ground source heat pump systems for commercial and residential buildings” is an ANSI designated bi-national consensus standard for the design and installation of ground source heat pump systems. It was first published in February 2016.

ANSI/CSA/IGSHPA C448-16 contains specific requirements for HDPE, PEX and PE-RT piping systems (pipe and fittings) for use as ground loop piping systems. By adding reference to C448 in this row, this will indicate that these materials (PEX and PE-RT) are explicitly approved in ANSI/CSA/IGSHPA C448-16.

Approved as Submitted (AS)

TABLE M2105.5

GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; CSA C448
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18; CSA C448

Code Change No: RM38-18

Original Proposal

Section(s): TABLE M2105.5

Proponents: LANCE MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (lmacnevin@plasticpipe.org); Mark Metzner, IGSHPA Canada, representing IGSHPA Canada (markmetzner@shaw.ca)

2018 International Residential Code

TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; CSA C448
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18; CSA C448

Reason: This proposal is on behalf of the International Ground Source Heat Pump Association (IGSHPA); Mark Metzner – President of IGSHPA Canada and the Chairman of ANSI/CSA/IGSHPA C448; and The Plastics Pipe Institute.

ANSI/CSA/IGSHPA C448-16 "Design and installation of ground source heat pump systems for commercial and residential buildings" is an ANSI designated bi-national consensus standard for the design and installation of ground source heat pump systems. It was first published in February 2016.

ANSI/CSA/IGSHPA C448-16 contains specific requirements for HDPE, PEX and PE-RT piping systems (pipe and fittings) for use as ground loop piping systems. By adding reference to C448 in this row, this will indicate that these materials (PEX and PE-RT) are explicitly approved in ANSI/CSA/IGSHPA C448-16.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code change proposal will not increase or decrease the cost of construction because it is simply identifying another industry consensus standard (C448) to which existing fittings for use with PEX and PE-RT can comply.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This adds another acceptable standard for these materials. (Vote 10-0)

Assembly Action: **None**

Final Action

RM38-18 **AS**

M9353/RM39-18

Date Submitted 2/25/2021	**Section** 2105.4	**Proponent** Mo Madani
Chapter 21	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

TABLE M2105.4, TABLE M2105.5, Chapter 44

Summary of Modification

Adds NSF 358-4 to tables M2105.5 and M2105.4

Rationale

At the proposal deadline, NSF 358-4 was still a draft standard, but it is expected to be published prior to the public hearing. The balloted draft standard will be submitted with the proposal. Anyone may receive a complimentary copy of this draft standard for the purpose of reviewing this proposal by emailing brown@nsf.org.

These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PE-RT piping and associated fittings are already accepted materials with referenced standards. NSF 358-4 is a proposed ANSI standard written specifically to contain requirements for PE-RT geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-4 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PE-RT piping systems.

Approved as Submitted (AS)

Revise as follows:

TABLE M2105.4

GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18, NSF358-4

TABLE M2105.5

GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM

	D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18, NSF 358-4

Add new standard(s) as follows:

NSF

NSF 358-4-2017: Polyethylene of raised temperature (PE-RT) pipe and fittings f or water-based ground-source (geothermal) heat pump systems

Code Change No: RM39-18

Original Proposal

Section(s): TABLE M2105.4, TABLE M2105.5, Chapter 44

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2018 International Residential Code
Revise as follows:

TABLE M2105.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18, NSF358-4

TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9

Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18, NSF 358-4

Add new standard(s) as follows:

NSF
NSF 358-4-2017: Polyethylene of raised temperature (PE-RT) pipe and fittings f or water-based ground-source (geothermal) heat pump systems

Reason: At the proposal deadline, NSF 358-4 was still a draft standard, but it is expected to be published prior to the public hearing. The balloted draft standard will be submitted with the proposal. Anyone may receive a complimentary copy of this draft standard for the purpose of reviewing this proposal by emailing brown@nsf.org.

These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PE-RT piping and associated fittings are already accepted materials with referenced standards. NSF 358-4 is a proposed ANSI standard written specifically to contain requirements for PE-RT geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-4 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PE-RT piping systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Providing an additional option is cost neutral.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This adds another acceptable standard for these materials. (Vote 10-0)

Assembly Action: **None**

Final Action

RM39-18 **AS**

M9356/RM40-18

Date Submitted 2/25/2021	**Section** 2105.4	**Proponent** Mo Madani
Chapter 21	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Approved as Submitted – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

TABLE M2105.4, TABLE M2105.5, Chapter 44

Original text of this code change is not consistent with that of the 2020 FBC-R.

Summary of Modification

Adds NSF 358-3 standard to Tables M2105.4 and M2105.5

Rationale

These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PEX piping and associated fittings are already accepted materials with referenced standards. NSF 358-3 is an ANSI standard written specifically to contain requirements for PEX geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-3 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PEX piping systems. Anyone wishing to receive a complimentary copy of this standard for the purpose of reviewing this code change can send an email to brown@nsf.org

Approved as Submitted (AS)

Revise as follows:

TABLE M2105.4

GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5, NSF 358-3
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18

TABLE M2105.5

GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5, NSF 358-3
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18

Add new standard(s) as follows:

NSF

358-3-2016: Cross-linked polyethylene (PEX) pipe and fittings f or water-based ground-source (geothermal) heat pump systems

Code Change No: RM40-18

Original Proposal

Section(s): TABLE M2105.4, TABLE M2105.5, Chapter 44

Proponents: Jeremy Brown, representing NSF International (brown@nsf.org)

2018 International Residential Code

Revise as follows:

TABLE M2105.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5, NSF 358-3
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18

TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5, NSF 358-3
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18

Add new standard(s) as follows:

NSF

358-3-2016: Cross-linked polyethylene (PEX) pipe and fittings f or water-based ground-source (geothermal) heat pump systems

Reason: These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PEX piping and associated fittings are already accepted materials with referenced standards. NSF 358-3 is an ANSI standard written specifically to contain requirements for PEX geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-3 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PEX piping systems. Anyone wishing to receive a complimentary copy of this standard for the purpose of reviewing this code change can send an email to brown@nsf.org

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding an additional standard choice will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This adds another acceptable standard for these materials. (Vote 10-0)

Assembly Action: **None**

Final Action

RM40-18 **AS**

M9370/RM42-18

Date Submitted	2/25/2021	**Section**	2105.7	**Proponent**	Mo Madani
Chapter	21	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

M2105.7

Summary of Modification

Revises the language to include reference to preparing pipe ends in accordance with manufacturer's instructions which will be specific to that particular type of plastic pipe

Rationale

This section is specific to plastic pipes and some of the existing language refers to terms such as "reamed" and "undercut" which only apply to metallic pipes. The revised language is more appropriate by including reference to preparing pipe ends in accordance with manufacturer's instructions which will be specific to that particular type of plastic pipe.

Approved as submitted (AS)

M2105.7 Preparation of pipe ends. Pipe shall be cut square ~~, reamed,~~ and shall be free of burrs and obstructions. ~~CPVC, PE and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~ be prepared in accordance with the pipe manufacturer's instructions.

Code Change No: RM42-18

Original Proposal

Section(s): M2105.7

Proponents: Gary Morgan, representing Viega LLC (gary.morgan@viega.us)

2018 International Residential Code

M2105.7 Preparation of pipe ends. Pipe shall be cut square ~~, reamed,~~ and shall be free of burrs and obstructions. ~~CPVC, PE and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~ <u>be prepared in accordance with the pipe manufacturer's instructions.</u>

Reason: This section is specific to plastic pipes and some of the existing language refers to terms such as "reamed" and "undercut" which only apply to metallic pipes. The revised language is more appropriate by including reference to preparing pipe ends in accordance with manufacturer's instructions which will be specific to that particular type of plastic pipe.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is only a clarification of existing language and will not result in any increased cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM42-18	**AS**

M9371/RM43-18

Date Submitted	2/25/2021	**Section**	2202.1	**Proponent**	Mo Madani
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

M2202.1

Summary of Modification

Revise the section to show that steel tubing must conform to ASTM A539 or stainless steel tubing must conform to ASTM A254 or ASTM A539. A269.

Rationale

Stainless steel tubing is an accepted material in accordance with NFPA 31 Standard for the Installation of Oil-Burning Equipment section 8.2.2.1 and is widely used in these applications due to its corrosion-resistance.

Approved as submitted (AS)

M2202.1 Materials. Piping shall consist of steel pipe, copper and copper-alloy pipe and tubing, steel tubing conforming to ASTM A539 or stainless steel tubing conforming to ASTM A254 or ASTM ~~A539.~~ A269. Aluminum tubing shall not be used between the fuel-oil tank and the burner units.

Code Change No: RM43-18

Original Proposal

Section(s): M2202.1

Proponents: Mark Fasel, Viega, representing Viega LLC (mark.fasel@viega.us)

2018 International Residential Code

Revise as follows:

M2202.1 Materials. Piping shall consist of steel pipe, copper and copper-alloy pipe and tubing, steel tubing conforming to ASTM A539 or stainless steel tubing conforming to ASTM A254 or ASTM ~~A539.~~ A269. Aluminum tubing shall not be used between the fuel-oil tank and the burner units.

Reason: Stainless steel tubing is an accepted material in accordance with NFPA 31 Standard for the Installation of Oil-Burning Equipment section 8.2.2.1 and is widely used in these applications due to its corrosion-resistance.

Bibliography:
®NFPA
NFPA 31 Standard for the Installation of Oil-Burning Equipment
Section 8.2.2.1
2016
Page 24
http://www.nfpa.org/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds stainless steel pipe as an additional piping material that can be used for these applications and therefore will not increase the costs of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM43-18	**AS**

M9372/RM45-18

Date Submitted	2/25/2021	**Section**	2202.2	**Proponent**	Mo Madani
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

M2202.2

Summary of Modification

Removed the term standard fittings

Rationale

Editorial: The term "standard fittings" is not used in any International codes and has no definition. There is no reason to state the word "standard".

Approved as submitted (AS)

Revise as follows:

M2202.2 Joints and fittings. Piping shall be connected with ~~standard~~ fittings compatible with the piping material. Cast-iron fittings shall not be used for oil piping. Unions requiring gaskets or packings, right or left couplings, and sweat fittings employing solder having a melting point less than 1,000°F (538°C) shall not be used for oil piping. Threaded joints and connections shall be made tight with a lubricant or pipe thread compound.

Code Change No: RM45-18

Original Proposal

Section(s): M2202.2

Proponents: Mark Fasel, representing Viega LLC (mark.fasel@viega.us)

2018 International Residential Code

Revise as follows:

M2202.2 Joints and fittings. Piping shall be connected with ~~standard~~ fittings compatible with the piping material. Cast-iron fittings shall not be used for oil piping. Unions requiring gaskets or packings, right or left couplings, and sweat fittings employing solder having a melting point less than 1,000°F (538°C) shall not be used for oil piping. Threaded joints and connections shall be made tight with a lubricant or pipe thread compound.

Reason: Editorial: The term "standard fittings" is not used in any International codes and has no definition. There is no reason to state the word "standard".

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The removal of the term standard fittings has no cost implications due to the fact this terminology has no requirements for listings or required testing associated with this proposal to remove this vague undefined terminology.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM45-18	**AS**

M8957/RB294-19

Date Submitted	2/12/2021	**Section**	104	**Proponent**	Mo Madani
Chapter	3317	**Affects HVHZ**	No	**Attachments**	Yes
TAC Recommendation	Approved as Submitted – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **Yes**

Related Modifications

AQ104

Summary of Modification

The proposed 300 pond ladder capacity coordinates with IMC Section 306.5. According to the Centers for Disease Control, the average American male over 30 years of age is 180 pounds. The margin of safety at 200 pounds capacity is inadequate to protect the public.

Rationale

The proposed 300 pond ladder capacity coordinates with IMC Section 306.5. According to the Centers for Disease Control, the average American male over 30 years of age is 180 pounds. The margin of safety at 200 pounds capacity is inadequate to protect the public.

Comment Period History

M8957-G1

Proponent Alan Gremillion **Submitted** 6/21/2021 **Attachments** No

Comment:

The cost increase associated with this change is $200 - $400. Price increase was provided by a millwork contractor.

ORIGINAL

AS - APPROVED AS SUBMITTED

Revise as follows:

AQ104.2.2.1 Size and capacity. Ladders accessing *lofts* shall have a rung width of not less than 12 inches (305 mm), and 10-inch (254 mm) to 14-inch (356 mm) spacing between rungs. Ladders shall be capable of supporting a 200 300-pound (~~75~~ 136 kg) load on any rung. Rung spacing shall be uniform within $^3/_8$ inch (9.5 mm).

Code Change No: RB294-19

Original Proposal

Section(s): AQ104.2.2.1 (New)

Proponent: Jay Hyde, representing Sacramento Valley Association of Building Officials (jhyde@mogaveroarchitects.com)

2018 International Residential Code

Revise as follows:

AQ104.2.2.1 Size and capacity. Ladders accessing *lofts* shall have a rung width of not less than 12 inches (305 mm), and 10-inch (254 mm) to 14-inch (356 mm) spacing between rungs. Ladders shall be capable of supporting a ~~200~~ 300-pound (~~75~~ 136 kg) load on any rung. Rung spacing shall be uniform within $^{3}/_{8}$ inch (9.5 mm).

Reason: The proposed 300 pond ladder capacity coordinates with IMC Section 306.5. According to the Centers for Disease Control, the average American male over 30 years of age is 180 pounds. The margin of safety at 200 pounds capacity is inadequate to protect the public.

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal MAY increase the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The 300 pound load is consistent with stair tread loads in footnote c to Table R301.5. (Vote: 9-2)

Assembly Action: **None**

Final Action

RB294-19	**AS**

TAC: Mechanical

Total Mods for **Mechanical** in **Denied – Consent: 26**

Total Mods for report: 97

Sub Code: Mechanical

M8443/M6-18

69

Date Submitted	2/1/2021	**Section**	301.8	**Proponent**	Mo Madani
Chapter	3	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Denied – Consent			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

Seismic

Summary of Modification

The added text clarifies the IBC location where specific seismic requirements are defined

Rationale

The added text clarifies the IBC location where specific seismic requirements are defined. This is intended to simply make the seismic design provisions more easily used, consistent with the intent as stated in 2015 NEHRP Recommended Provisions Section 1.1.2, to preserve life safety by maintaining the position of components through anchorage, bracing and strength.

Revise as follows: Approved as Submitted

301.18 Seismic resistance. Where earthquake loads are applicable in accordance with the International Building Code, mechanical system supports, anchorage, and bracing, shall be designed and installed for ~~the~~ seismic forces in accordance with Chapter 16 of the International Building Code.

Code Change No: M6-18

Original Proposal

Section(s): 301.18

Proponents: Kelly Cobeen, Wiss Janney Elstner Associates, Inc, representing Federal Emergency Management Agency/Applied Technology Council - Seismic Code Support Committee (KCobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

2018 International Mechanical Code

Revise as follows:

301.18 Seismic resistance. Where earthquake loads are applicable in accordance with the International Building Code, mechanical system supports, anchorage, and bracing, shall be designed and installed for ~~the~~ seismic forces in accordance with Chapter 16 of the International Building Code.

Reason: The added text clarifies the IBC location where specific seismic requirements are defined. This is intended to simply make the seismic design provisions more easily used, consistent with the intent as stated in 2015 NEHRP Recommended Provisions Section 1.1.2, to preserve life safety by maintaining the position of components through anchorage, bracing and strength.

Bibliography:
NEHRP Recommended Seismic Provisions for New Buildings and Other Structures. 2015 Edition (FEMA P-1050-1), Federal Emergency Management Agency, Washington, D.C.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The proposals clarifies the intent of the code and does not impose any new requirements that were not already in effect.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Code officials already know how to apply the IBC. (Vote 6-5)

Assembly Action: **None**

Final Hearing Results

M6-18	**AS**

M8449/M20-18

Date Submitted 2/1/2021	**Section** 401.2	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

403.1

Summary of Modification

The code change revises the ventilation requirements to be better understood.

Rationale

After receiving many questions on the ventilation requirements for R-2 dwellings it has become clear that this section of the IMC is not easily understood, agreed with or being enforced as written. A stakeholder group was put together to tackle the issue and to see how we could change the ventilation requirements to be better understood. The group consisted of members from CAPMO, PNNL, Commissioning Agents, Mechanical Engineers, Code Officials, energy raters and energy advocates.

Comment Period History

M8449-G1

Proponent Joseph Belcher **Submitted** 6/30/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change.

Approved as Submitted (AS)

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by~~ <u>Dwelling units complying with the air leakage requirements of the Interanational Energy Conservation Code or ASHRAE 90.1 shall be ventilated by</u> mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or exhaust air except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 occupancies ~~three stories and less in height above grade plane~~ shall be provided by an exhaust system, supply system or combination thereof. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

Code Change No: M20-18

Original Proposal

Section(s): 401.2, 403.1

Proponents: Shaunna Mozingo, representing City of Cherry Hills Village, Colorado Code Consulting (smozingo@coloradocode.net)

2018 International Mechanical Code

Revise as follows:

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by~~ Dwelling units complying with the air leakage requirements of the Interanational Energy Conservation Code or ASHRAE 90.1 shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or exhaust air except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 occupancies ~~three stories and less in height above grade plane~~ shall be provided by an exhaust system, supply system or combination thereof. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

Reason: After receiving many questions on the ventilation requirements for R-2 dwellings it has become clear that this section of the IMC is not easily understood, agreed with or being enforced as written. A stakeholder group was put together to tackle the issue and to see how we could change the ventilation requirements to be better understood. The group consisted of members from CAPMO, PNNL, Commissioning Agents, Mechanical Engineers, Code Officials, energy raters and energy advocates.

The mantra of the meeting was: "*"We either agree that it isn't required or agree that it is – then we change it."*
Here were the discussed issues that we saw:

1: The lack of understanding of R-2's over 3 stories or 3 stories and less. (IECC definitions of residential and commercial buildings). Most people aren't looking at these definitions in the IECC so they all assume that since an "R-2" is built out of the IBC it is considered a commercial building in the IECC. When they get to the IMC and it starts talking about 3 stories or less and over 3 stories they don't understand why the buildings are treated differently for ventilation or any other requirement. While, from a building science perspective it can make sense why these buildings are separated this way, a lot of education time is spent on this very issue.
RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.
COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of "Residential building."

2: IMC wording that is confusing, especially for people who also read the IRC Mechanical and the IECC because they aren't worded the same and it makes it hard to know what the requirements are. Some confusion came in by code officials who were requiring mechanical ventilation for all R-2s, commercial or residential, because they felt that the section below was stating that all envelopes had to be as tight as 3ach/50 even if they weren't tested. We had to go to ICC for an interpretation of the issues because 50% of the people believed mechanical ventilation was required for any R-2 and 50% believed it was only required for R-2s 3 stories or less.

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or exhaust air except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 occupancies three stories and less in height above grade plane shall be provided by an exhaust system, supply system or combination thereof. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

3: ICC's code opinion:

From: Jason Toves <jtoves@ICCSafe.ORG>**Sent:** Wednesday, April 12, 2017 1:07 PM**To:** Shaunna Mozingo**Cc:** Renee Testroet**Subject:** RE: Section 401.2 - 2015 IMC

Ms. Mozingo,

Following are the responses to your questions.

April 12, 2017
RE: 15 IMC 401.2

Q1: Are R-2 occupancies in commercial buildings, as defined in the 2015 IECC, required to have a blower door test performed per Section 401.2 of the 2015 IMC?
A1: No, Section 401.2 of the IMC does not require blower door testing of R-2 occupancies in commercial buildings. It requires mechanical ventilation when R-2 occupancies are tested in accordance with Section R402.4.1.2 of the International Energy Conservation Code and the air infiltration rate is less than 5 air changes per hour, without requiring such testing.

Q2: Are R-2 occupancies in commercial buildings, as defined in the 2015 IECC, required to be mechanically ventilated per Section 401.2 of the 2015 IMC?
A2: No, Section 401.2 requires either natural ventilation per Section 402 or mechanical ventilation per Section 403. Section 401.2 only requires mechanical ventilation when R-2 occupancies are tested in accordance with Section R402.4.1.2 of the International Energy Conservation Code and the air infiltration rate is less than 5 air changes per hour, without requiring mechanical ventilation for R-2 occupancies in commercial buildings.

It should be noted that Section R402.4.1.2 of the 2015 International Energy Conservation Code applies to "Residential Buildings" (as defined in the IECC) only.

So now you decide, should ventilation actually be required in R-2 occupancies over 3 stories the same as it should be in buildings of less than 3 stories? Why should it be different when both codes require a tight building envelope with continuous air barriers?

The overarching feeling from the group was: *"Everyone is building tight. Hinging mechanical ventilation on a test is causing a problem. It should just be required for all R occupancies."*

We played around with the wording and finally just decided that it was easiest to just say that if your envelope complies with an energy code you must provide mechanical ventilation. It was that simple so that is what we did.

Cost Impact: The code change proposal will increase the cost of construction.
This proposal will increase the cost of construction but depending on the method chosen to mechanically ventilate (balanced, exhaust only, supply only), the cost typically only includes the cost of a timer/timers for an exhaust fan that is already required in a bathroom so that it runs continuously or down to 25% of the time. There are definitely climates where an exhaust only or supply only system are not recommended but there are more and more options for an economical balanced system that doesn't rely on an ERV or HRV, even though those costs are coming down as well.

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Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on proponent's published reason statement. Proposal adds option for ASHRAE 90.1 and connects the IMC to the IECC. (Vote 6-5)

Assembly Action: **None**

Final Hearing Results

M20-18 **AS**

M8458/M30-18

Date Submitted 2/3/2021	**Section** 403.3.1.3	**Proponent** Mo Madani
Chapter 4	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Summary of Modification

Modification of text of Section 403.3.1.3 System operation.

Rationale

Demand control ventilation systems modulate outdoor airflow based on the number of occupants present in a space, and if zero occupants are detected, the ventilation airflow might be reduced to zero cfm. This scenario ignores the fact that the ventilation table in the IMC has two components; cfm rate per person and cfm rate per square foot of space. When the space is expected to be occupied, such as during business hours, the contaminants coming from the space contents still need to be diluted by ventilation air, therefore the cfm/SQ FT component of ventilation must not be shut off.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

403.3.1.3 System operation. The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3.1.1 and the actual number of occupants present. <u>Where demand controlled ventilation is employed to adjust the outdoor air flow rate based on the actual number of occupants present, the minimum quantity of outdoor air shall not fall below that determined from the area outdoor airflow rate column of Table 403.3.1.1 during periods when the building is expected to be occupied.</u>

Code Change No: M30-18

Original Proposal

Section(s): 403.3.1.3

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Mechanical Code

Revise as follows:

403.3.1.3 System operation. The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3.1.1 and the actual number of occupants present. <u>Where demand controlled ventilation is employed to adjust the outdoor air flow rate based on the actual number of occupants present, the minimum quantity of outdoor air shall not fall below that determined from the area outdoor airflow rate column of Table 403.3.1.1 during periods when the building is expected to be occupied.</u>

Reason: Demand control ventilation systems modulate outdoor airflow based on the number of occupants present in a space, and if zero occupants are detected, the ventilation airflow might be reduced to zero cfm. This scenario ignores the fact that the ventilation table in the IMC has two components; cfm rate per person and cfm rate per square foot of space. When the space is expected to be occupied, such as during business hours, the contaminants coming from the space contents still need to be diluted by ventilation air, therefore the cfm/SQ FT component of ventilation must not be shut off.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M30-18 **AS**

M8471/M34-18

Date Submitted 2/4/2021	**Section** 501.2	**Proponent** Mo Madani
Chapter 5	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

504.1, 505.3, 510.4

Original text of section 505.3 is not consistent with that of the FBC-M/505.1.

Summary of Modification

Modification of text for Sections 501.2, 504.1, 505.3, and 510.4. This is an editorial clean up of the code.

Rationale

This is strictly an editorial clean up as the code doesn't have to keep repeating itself.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

501.2 Independent system required. Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer, domestic kitchen and hazardous exhaust shall be independent of all other systems. Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. ~~Kitchen~~ Commercial kitchen exhaust systems shall be constructed in accordance with ~~Section 505 for domestic cooking operations and~~ Sections 506 through 509. ~~for commercial cooking operations.~~

504.1 Installation. Clothes dryers shall be exhausted in accordance with the manufacturer's instructions. Dryer exhaust systems shall ~~be independent of all other systems and shall~~ convey the moisture and any products of combustion to the outside of the building.

Exception: This section shall not apply to listed and labeled condensing (ductless) clothes dryers.

505.3 Exhaust ducts.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 air tight ~~,~~ 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 904.13 of the International Fire Code.

Exceptions:

1. In other than Groups I-1 and I-2, where installed in accordance with the manufacturer's instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.
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.

Delete without substitution:

~~**510.4 Independent system. Hazardous exhaust systems shall be independent of other types of exhaust systems.**~~

Code Change No: M34-18

Original Proposal

Section(s): 501.2, 504.1, 505.3, 510.4

Proponents: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Mechanical Code

Revise as follows:

501.2 Independent system required. Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer, domestic kitchen and hazardous exhaust shall be independent of all other systems. Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. ~~Kitchen~~ Commercial kitchen exhaust systems shall be constructed in accordance with ~~Section 505 for domestic cooking operations and~~ Sections 506 through 509. ~~for commercial cooking operations.~~

504.1 Installation. Clothes dryers shall be exhausted in accordance with the manufacturer's instructions. Dryer exhaust systems shall ~~be independent of all other systems and shall~~ convey the moisture and any products of combustion to the outside of the building.

Exception: This section shall not apply to listed and labeled condensing (ductless) clothes dryers.

505.3 Exhaust ducts. 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 air tight ~~,~~ 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 904.13 of the International Fire Code.

Exceptions:

1. In other than Groups I-1 and I-2, where installed in accordance with the manufacturer's instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.
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.

Delete without substitution:

~~**510.4 Independent system.** Hazardous exhaust systems shall be independent of other types of exhaust systems.~~

Reason: This is strictly an editorial clean up as the code doesn't have to keep repeating itself.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This is strictly editorial.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M34-18 **AS**

M8500/M64-18

Date Submitted 2/4/2021	**Section** 601.5	**Proponent** Mo Madani
Chapter 6	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

Addition of exception to Section 601.5 "Return air opening". Adds an exception concerning dwelling units where the kitchen and living spaces are a single room.

Rationale

There is an increasing trend towards smaller living spaces, including studio apartment, extended stay hotels, small homes and even tiny homes. Where the cooking appliance and living space are combined in a single space, requiring 10' between to return air inlet and the small cooking appliance serves no purpose. Cooking odors, even from burned food, will spread throughout the room, no matter how far the return is located from the appliance.

As some may be concerned with air-flow towards a return inlet impacting the flame of a gas burner, this exception is limited to electric appliances.

Approved as Submitted

2018 International Mechanical Code

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 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 shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.
8. Return air 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.

Exceptions:

1. Taking return air 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. <u>Taking return air 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 in any direction from the return air intake opening.</u>

~~2~~3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Code Change No: M64-18

Original Proposal

Section(s): 601.5

Proponents: Brent Ursenbach, representing Salt Lake County Planning and Development Services (bursenbach@slco.org)

2018 International Mechanical Code

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 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 shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.
8. Return air 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.

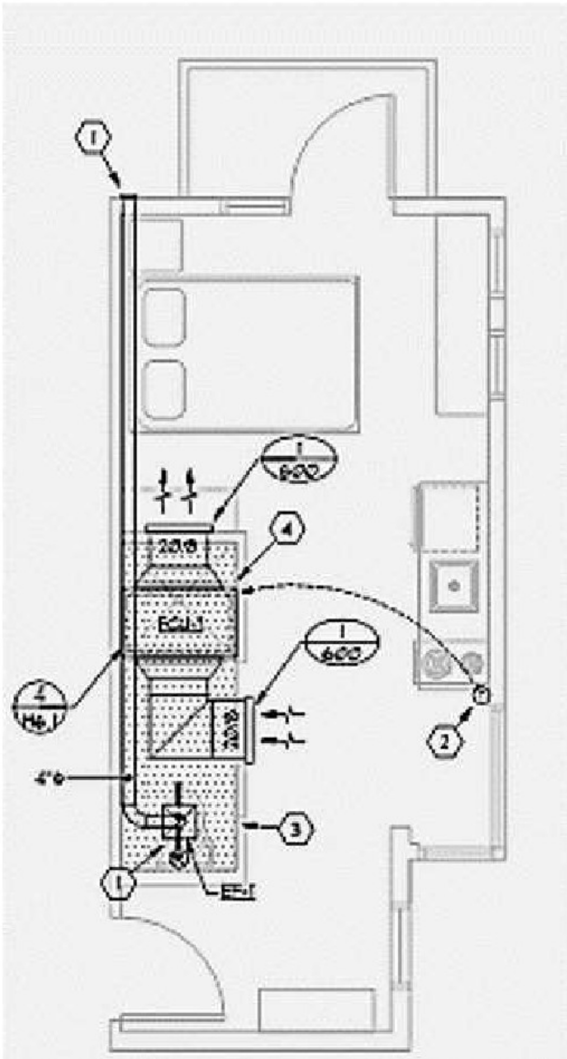
Exceptions:

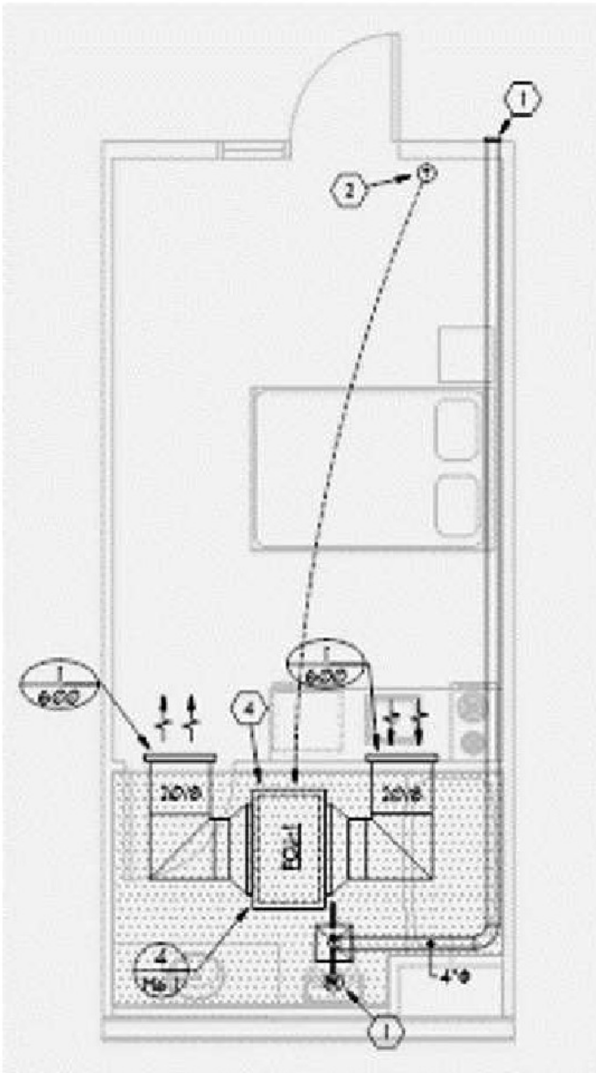
1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking appliances.
2. Taking return air from a kitchen is not prohibited in a dwelling unit where the kitchen and living spaces are in a single room and the cooking appliance is electric and located not less than 5 feet in any direction from the return air intake opening.

~~2~~3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason: There is an increasing trend towards smaller living spaces, including studio apartment, extended stay hotels, small homes and even tiny homes. Where the cooking appliance and living space are combined in a single space, requiring 10' between to return air inlet and the small cooking appliance serves no purpose. Cooking odors, even from burned food, will spread throughout the room, no matter how far the return is located from the appliance.

As some may be concerned with air-flow towards a return inlet impacting the flame of a gas burner, this exception is limited to electric appliances.





Cost Impact: The code change proposal will decrease the cost of construction.
This proposal will in some cases, reduce the length of return air duct required, reduce duct ceiling drops, resulting in a material and labor savings.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 6-4)

Assembly Action: **None**

Final Hearing Results

M64-18	**AS**

M8502/M72-18

Date Submitted 2/4/2021	**Section** 607.4	**Proponent** Mo Madani
Chapter 6	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

With the smaller fire and smoke dampers, the ductwork is too small to mount an adequate size access door. NFPA 80 addresses this problem by mandating the minimum size access door shall be no smaller than 12 inch square or you must supply a removable ductwork section,

Rationale

Fire and smoke dampers are an important part of a HVAC ductwork system, in the event of a fire they are designed to close and prevent the spread of fire and smoke throughout the building duct work system, giving the building occupants enough time to evacuate and also providing the fire department sufficient time to enter the building and extinguish the fire safely.
The NFPA requires all fire and smoke dampers be periodically inspected, maintained and tested per their guidelines to assure these dampers function properly in the event of a fire.

The NFPA requires that fire and smoke dampers are inspected and maintained through an access door that provides full unobstructed access to these dampers. These access doors are mounted on the ductwork as close as possible to the damper. Access doors work well for large fire and smoke dampers because the ductwork size is large enough to except an adequate sized access door, the problem is with the smaller fire and smoke dampers, the ductwork is too small to mount an adequate size access door. NFPA 80 addresses this problem by mandating the minimum size access door shall be no smaller than 12 inch square or you must supply a removable ductwork section, this removable section provides the technician performing the inspection with the unobstructed access needed to properly inspect and maintain the smaller fire and smoke dampers. See M72-18 and AMPC2.

Approved As Modified (AM)

Original mod

Revise as follows:

[BF] 607.4 Access and identification. Fire and smoke dampers shall be provided with an *approved* means of access, ~~large enough~~ to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305mm) square or provided with a removable duct section. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

2018 International Mechanical Code

Modified by Public Comment 1:

Revise as follows:

[BF] 607.4 Access and identification. ~~Fire~~ Access and identification of fire and smoke dampers shall ~~be provided with an *approved* means of access, to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305mm) square or provided with a removable duct section. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.~~ comply with Sections 607.4.1 through 607.4.2.

607.4.1 Access. Fire and smoke dampers shall be provided with an approved means of access that is large enough to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305 mm) square or provided with a removable duct section.

607.4.1.1 The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance-rating of the assembly. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

607.4.1.2 Restricted Access. Where space constraints or physical barriers restrict access to a damper for periodic inspection and testing, the damper shall be a single- or multi-blade damper and shall comply with the remote inspection requirements of NFPA 80 or NFPA 105.

607.4.2 Identification. Access points shall be permanently identified on the exterior of a label having letters not less than 1/2 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER.

Code Change No: M72-18

Original Proposal

Section(s): 607.4

Proponents: Joseph Sandman, representing self (josephs@fioptics.com)

2018 International Mechanical Code

Revise as follows:

[BF] 607.4 Access and identification. Fire and smoke dampers shall be provided with an *approved* means of access, ~~large enough~~ to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305mm) square or provided with a removable duct section. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

Reason: Fire and smoke dampers are an important part of a HVAC ductwork system, in the event of a fire they are designed to close and prevent the spread of fire and smoke throughout the building duct work system, giving the building occupants enough time to evacuate and also providing the fire department sufficient time to enter the building and extinguish the fire safely.

The NFPA requires all fire and smoke dampers be periodically inspected, maintained and tested per their guidelines to assure these dampers function properly in the event of a fire.

The NFPA requires that fire and smoke dampers are inspected and maintained through an access door that provides full unobstructed access to these dampers. These access doors are mounted on the ductwork as close as possible to the damper. Access doors work well for large fire and smoke dampers because the ductwork size is large enough to except an adequate sized access door, the problem is with the smaller fire and smoke dampers, the ductwork is too small to mount an adequate size access door. NFPA 80 addresses this problem by mandating the minimum size access door shall be no smaller than 12 inch square or you must supply a removable ductwork section, this removable section provides the technician performing the inspection with the unobstructed access needed to properly inspect and maintain the smaller fire and smoke dampers.

Our concerns are with the smaller fire and smoke dampers, because in many cases the removable ductwork sections for these dampers are not being provided as mandated by the NFPA 80, rather inadequate small access doors are being installed in the ductwork system next to the fire and smoke damper. Small access doors don't provide the access needed to properly inspect and maintain the fire and smoke dampers. The inadequacies of these access doors is nothing new in the HVAC industry, in many cases when it becomes time for the periodic damper inspections the maintenance technician will ignore and pass over the small fire and smoke dampers knowing that it's virtually impossible to perform the inspection through the access doors. We are asking for your help in addressing this problem, these fire and smoke dampers are much to important to be ignored, they save lives and countless dollars in property damage, the solutions are known they are just not being implemented.

My recommendation would be to adopt the National Fire Protection Association (NFPA) standards as set forth in NFPA 80

- **19.2.3 Access.** Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 in. (305mm) square or provided with a removable duct section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed change will reduce the time for inspecting and servicing fire dampers by 50%.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: The proposal increases ability to inspect and service dampers. Approval is consistent with recommendation for FS66-18. The proposed text is more enforceable because it states dimensions instead of "large enough." (Vote 14-0)

Assembly Action: **None**

Public Comments

Public Comment 1:

William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com) requests As Modified by Public Comment

2018 International Mechanical Code

607.4 Access and identification. ~~Fire~~ Access and identification of fire and smoke dampers shall ~~be provided with an *approved* means of access, to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305mm) square or provided with a removable duct section. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.~~ comply with Sections 607.4.1 through 607.4.2.

607.4.1 Access. Fire and smoke dampers shall be provided with an approved means of access that is large enough to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305 mm) square or provided with a removable duct section.

607.4.1.1 The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance-rating of the assembly. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

607.4.1.2 Restricted Access. Where space constraints or physical barriers restrict access to a damper for periodic inspection and testing, the damper shall be a single- or multi-blade damper and shall comply with the remote inspection requirements of NFPA 80 or NFPA 105.

607.4.2 Identification. Access points shall be permanently identified on the exterior of a label having letters not less than 1/2 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER.

Commenter's Reason: The Public Comment merely revises the IMC to be consistent with the Committee Recommendation for Approval as Modified for FS66-18. The Committee Reason Statement for M72-18 indicated the desire of the Committee to be consistent with the action on FS66-18. The proposed language in the Public Comment was not submitted as a modification during the Committee Action Hearings since I felt that it was substantive. However, I promised the Committee that a Public Comment would be submitted to make the IMC consistent with the IBC language resulting from the action on FS66-18.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction The language is consistent with requirements proposed for the 2021 Edition of the IBC.

Final Action Results

M72-18	**AMPC1**

M8512/M84-18

Date Submitted 2/5/2021	**Section** 929	**Proponent** Mo Madani
Chapter 9	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

929.1, 202

This code change is not needed. The proposed change is already covered by the 2020 FBC, M.

Summary of Modification

This proposal intends to align IMC terminology for large diameter ceiling fans to be consistent with that of the terminology in the DOE definitions per test standard10-CFR-Part 430-Appendix U, Section 1.14, as published in 2016

Rationale

This proposal intends to align IMC terminology for large diameter ceiling fans to be consistent with that of the terminology in the DOE definitions per test standard10-CFR-Part 430-Appendix U, Section 1.14, as published in 2016.
https://www.law.cornell.edu/cfr/text/10/appendix-U_to_subpart_B_of_part_430

Comment Period History

M8512-G1

Proponent Joseph Belcher **Submitted** 6/30/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) supports the adoption of this code change.

Approved as Modified

Original Proposal:

SECTION 929
~~HIGH-VOLUME~~ LARGE-DIAMETER CEILING FANS

929.1 General. Where provided, ~~high-volume~~ large-diameter ceiling fans shall be tested and labeled in accordance with AMCA 230, listed and labeled in accordance with UL 507, and installed in accordance with the manufacturer's instructions.

~~HIGH-VOLUME,~~ LARGE-DIAMETER CEILING FAN. A ~~lowspeed~~ ceiling fan that ~~circulates large volumes of air and that~~ is greater than 7 feet (2134 mm) in diameter. These fans are~~sometimes~~also referred to as High-Volume, Low-Speed (HVLS) fans

Modified Proposal:

LARGE-DIAMETER CEILING FAN. A ceiling fan that is greater than 7 feet (2134 mm) in diameter. These fans are ~~sometimes~~also referred to as High-Volume, Low-Speed (HVLS) fans.

Code Change No: M84-18

Original Proposal

Section(s): 929, 929.1, 202

Proponents: Amanda Hickman, The Hickman Group, representing AMCA International (amanda@thehickmangroup.com)

2018 International Mechanical Code

Revise as follows:

SECTION 929
~~HIGH-VOLUME~~ LARGE-DIAMETER CEILING FANS

929.1 General. Where provided, ~~high-volume~~ large-diameter ceiling fans shall be tested and labeled in accordance with AMCA 230, listed and labeled in accordance with UL 507, and installed in accordance with the manufacturer's instructions.

~~HIGH-VOLUME,~~ LARGE-DIAMETER CEILING FAN. A ~~lowspeed~~ ceiling fan that ~~circulates large volumes of air and that~~ is greater than 7 feet (2134 mm) in diameter. These fans are ~~sometimes~~ also referred to as High-Volume, Low-Speed (HVLS) fans.

Reason: This proposal intends to align IMC terminology for large diameter ceiling fans to be consistent with that of the terminology in the DOE definitions per test standard10-CFR-Part 430-Appendix U, Section 1.14, as published in 2016. https://www.law.cornell.edu/cfr/text/10/appendix-U_to_subpart_B_of_part_430

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a title change only, removing "High-Volume" from the title does not impact cost

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

LARGE-DIAMETER CEILING FAN. A ceiling fan that is greater than 7 feet (2134 mm) in diameter. These fans are ~~sometimes~~ also referred to as High-Volume, Low-Speed (HVLS) fans.

Committee Reason: Approval was based on the proponent's published reason statement. The modification is simply editorial. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M84-18	**AM**

M8517/M89-18

Date Submitted 2/5/2021	**Section** 1103.1	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Table 1103.1

Original text of Table 1103.1 is not consistent with that of the 2020 FBC-M.

Summary of Modification

The Refrigerant Classifications (except Degrees of Hazard) are determined by ASHRAE SSPC 34 and published in ASHRAE Standard 34. This proposal seeks to update the refrigerant table with the new refrigerants added to Standard 34 since the last code cycle

Rationale

The Refrigerant Classifications (except Degrees of Hazard) are determined by ASHRAE SSPC 34 and published in ASHRAE Standard 34. This proposal seeks to update the refrigerant table with the new refrigerants added to Standard 34 since the last code cycle. The reasons for the additions of new refrigerants can be found at https://www.ashrae.org/standards-research--technology/standards-addenda. All proposed changes are either incorporated into ASHRAE Standard 34-2016 or the published addenda to ASHRAE Standard 34-2016 located at the link above.

Approved as Modified

Original Proposal:

2018 International Mechanical Code

Revise as follows:

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE			
				Pounds per 1,000cubic feet	ppm	g/m^3	OEL[e]
R-11[d]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.2	C1,000
R-12[d]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	1,000
R-13[d]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—	1,000
R-13B1[d]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—	1,000
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400	1,000
R-22	$CHClF_2$	chlorodifluoromethane	A1	13	59,000	210	1,000
R-23	CHF_3	trifluoromethane (fluoroform)	A1	7.3	41,000	120	1,000
R-30	CH_2Cl_2	dichloromethane (methylene chloride)	B1	—	—	—	—
R-32	CH_2F_2	difluoromethane (methylene fluoride)	A2[f]	4.8	36,000	77	1,000
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—	—
R-50	CH_4	methane	A3	—	—	—	1,000
R-113[d]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20	1,000
R-114[d]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140	1,000
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
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57	50
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56	1,000
R-125	CHF_2CF_3	pentafluoroethane	A1	23	75,000	370	1,000
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	13	50,000	210	1,000
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	0.78	2,600	12	500
R-142b	CH_3CClF_2	1-chloro-1, 1-difluoroethane	A2	5.1	20,000	83	1,000
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2[f]	4.5	21,000	70	1,000
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	1,000
R-170	CH_3CH_3	ethane	A3	0.54	7,000	8.7	1,000
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	1,000
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	43	90,000	690	1,000
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
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190	300
R-290	$CH_3CH_2CH_3$	propane	A3	0.56	5,300	9.5	1,000
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	41	80,000	660	1,000
R-400[d]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	1,000

R-400[d]	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
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120	1,000
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84	1,000
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270	1,000
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240	1,000
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120	1,000
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	70,000	290	1,000
R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500	1,000
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/2.5)	—	16	57,000	260	1,000
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	25	1,000
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300	1,000
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330	1,000
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290	1,000
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250	1,000
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280	1,000
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-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	95,000	340	1,000
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110	1,000
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120	1,000
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420	1,000
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430	1,000
R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	990
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	980
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	1,000
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	94	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	95	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
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	3.5	13,000	56	1,000
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	70	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	1,000
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	1,000
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	1,000
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	45,000	190	1,000
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280	1,000
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330	1,000
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290	1,000
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250	1,000
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290	1,000
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260	1,000
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	310	1,000
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	970

R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260	1,000
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
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	83,000	370	1,000
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	1,000
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	1,000
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.69	5,500	11	1,000
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	700
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	880
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.51	4,500	8.1	950
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.6	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	1,000
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	1,000
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	1,000
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.0	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	990
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	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	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	580
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2[f]	5.1	21,000	81	850
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2[f]	4.3	23,000	69	890
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2[f]	4.2	16,000	67	930
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2[f]	2.5	16,000	39	960
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2[f]	2.6	16,000	42	900
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2[f]	23	30,000	360	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	890
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	830
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
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)	A2[f]	5.3	18,000	81	520
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2[f]	5.3	18,000	81	530
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	~~100,000~~10,000	440	780
R-452B	zeotrope	R-32/125/1234yf (67.0/7.0/26.0)	A2[???????f]	23	30,000	360	870
R-452C	zeotrope	R-32/125/1234yf (12.5/61.0/26.5)	A1	27	100,000	430	800
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)	A2[f]	28	16,000	450	690
R-454B	zeotrope	R-32/1234yf (68.9/31.1)	A2[???????f]	22	19,000	360	850
R-454C	zeotrope	R-32/1234yf (21.5/78/5)	A2[???????f]	29	19,000	460	620
R-455A	zeotrope	R-744/32/1234yf (3.0/21.5/75.5)	A2[???????f]	23	30,000	380	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)	A2[???????f]	25	15,000	400	650

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)	A2???????[f]	23	27,000	360	870
R-459B	zeotrope	R-32/1234yf/1234ze(E) (21.0/69.0/10.0)	A2???????[f]	30	16,000	470	640
R-460A	zeotrope	R-32/125/134a/1234ze(E) (12.0/52.0/14.0/22.0)	A1	24	92,000	380	650
R-460B	zeotrope	R-32/125/134a/1234ze(E) (28.0/25.0/20.0/27.0)	A1	25	120,000	400	950
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	1,000
R-500[e]	azeotrope	R-12/152a (73.8/26.2)	A1	7.6	30,000	120	1,000
R-501[d]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	1,000
R-502[e]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	1,000
R-503[e]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	1,000
R-504[d]	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	520	1,000
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220	1,000
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200	1,000
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	390	1,000
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	1,000
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	1,000
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	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	62,000	300	810
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	7.0	27,000	110	590
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	1,000
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000
R-601	$CH_3CH_2CH_2CH_2CH_3$	pentane	A3	0.18	1,000	2.9	600
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600
R-610	ethoxyethane (ethyl ether)	$CH_3CH_2OCH_2CH_3$	—	—	—	—	400
R-611	methyl formate	$HCOOCH_3$	B2	—	—	—	100
R-717	NH_3	ammonia	B2[f]	0.014	320	0.22	25
R-718	H_2O	water	A1	—	—	—	—
R-744	CO_2	carbon dioxide	A1	4.5	40,000	72	5,000
R-1130(E)	CHCl=CHCl	trans-1,2-dichloroethene	B1	0.25	1,000	4	200
R-1132a	CF2=CH2	1,1-difluoroethylene	A2	2.0	13,000	33	500
R-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	200
R-1224yd(Z)	CF3CF=CHCl	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	360	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	A2[f]	4.7	16,000	75	500
R-1234ze(E)	$CF_3CH=CHF$	trans-1,3,3,3-tetrafluoro-1 -propene	A2[f]	4.7	16,000	75	800
R-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7	500
R-1336mzz(Z)	CF3CHCHCF3	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	5.4	13,000	87.0	500

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

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

b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.
c. For installations that are entirely outdoors, use 3-1-0.
d. Class I ozone depleting substance; prohibited for new installations.
e. 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.
f. The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.

Modify proposal:

CHEMICAL REFRIGERANTFORMULACHEMICAL NAME OF BLENDREFRIGERANTCLASSIFICATIONAMOUNT OF REFRIGERANT PER OCCUPIED SPACE[F] DEGREES OF HAZARD

Pounds per 1,000cubic feetppmg/m^3 OEL[e]

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

Code Change No: M89-18

Original Proposal

Section(s): TABLE 1103.1

Proponents: Connor Barbaree, representing ASHRAE (cbarbaree@ashrae.org)

2018 International Mechanical Code

Revise as follows:

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-11[d]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.2	C1,000	2-0-0[b]
R-12[d]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	1,000	2-0-0[b]
R-13[d]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—	1,000	2-0-0[b]
R-13B1[d]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—	1,000	2-0-0[b]
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-32	CH_2F_2	difluoromethane (methylene fluoride)	A2[f]	4.8	36,000	77	1,000	1-4-0
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—	—	—
R-50	CH_4	methane	A3	—	—	—	1,000	—
R-113[d]	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[d]	$CClF_2CClF_2$	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	500	2-1-0

R-142b	CH_3CClF_2	1-chloro-1, 1-difluoroethane	A2	5.1	20,000	83	1,000	2-4-0
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2[f]	4.5	21,000	70	1,000	2-0-0[b]
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	1,000	1-4-0
R-170	CH_3CH_3	ethane	A3	0.54	7,000	8.7	1,000	2-4-0
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	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	0.56	5,300	9.5	1,000	2-4-0
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	41	80,000	660	1,000	—
R-400[d]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	1,000	2-0-0[b]
R-400[d]	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	70,000	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 (45.0/7.0/5.5/2.5)	—	16	57,000	260	1,000	—
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	25	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-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	95,000	340	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]
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	990	—
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	980	—
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	1,000	—
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	94	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	95	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	56	1,000	2-0-0[b]
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	70	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	1,000	—
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	1,000	—
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	1,000	—
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	45,000	190	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	310	1,000	2-0-0[c]
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	970	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	83,000	370	1,000	—
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	1,000	—
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	1,000	—
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.69	5,500	11	1,000	—
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	700	—
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	880	—
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.51	4,500	8.1	950	—
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.6	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	1,000	—
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	1,000	—
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	1,000	—
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.0	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	990	—
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	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	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	580	—
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2[f]	5.1	21,000	81	850	—
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2[f]	4.3	23,000	69	890	—
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2[f]	4.2	16,000	67	930	—
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2[f]	2.5	16,000	39	960	—
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2[f]	2.6	16,000	42	900	—
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2[f]	23	30,000	360	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	890	—
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	830	—
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	-
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)	A2[f]	5.3	18,000	81	520	—
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2[f]	5.3	18,000	81	530	—
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	~~100,000~~ 10,000	440	780	—
R-452B	zeotrope	R-32/125/1234yf (67.0/7.0/26.0)	A2[f]	23	30,000	360	870	-
R-452C	zeotrope	R-32/125/1234yf (12.5/61.0/26.5)	A1	27	100,000	430	800	-
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)	A2[f]	28	16,000	450	690	-
R-454B	zeotrope	R-32/1234yf (68.9/31.1)	A2[f]	22	19,000	360	850	-
R-454C	zeotrope	R-32/1234yf (21.5/78/5)	A2[f]	29	19,000	460	620	-
R-455A	zeotrope	R-744/32/1234yf (3.0/21.5/75.5)	A2[f]	23	30,000	380	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)	A2[f]	25	15,000	400	650	-
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)	A2[f]	23	27,000	360	870	-
R-459B	zeotrope	R-32/1234yf/1234ze(E) (21.0/69.0/10.0)	A2[f]	30	16,000	470	640	-
R-460A	zeotrope	R-32/125/134a/1234ze(E) (12.0/52.0/14.0/22.0)	A1	24	92,000	380	650	-
R-460B	zeotrope	R-32/125/134a/1234ze(E) (28.0/25.0/20.0/27.0)	A1	25	120,000	400	950	-
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	1,000	-
R-500[c]	azeotrope	R-12/152a (73.8/26.2)	A1	7.6	30,000	120	1,000	2-0-0[b]
R-501[d]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	1,000	—
R-502[c]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	1,000	2-0-0[b]
R-503[c]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	1,000	2-0-0[b]
R-504[d]	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	520	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	390	1,000	2-0-0[b]
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	1,000	—
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	1,000	—
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	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	62,000	300	810	-
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	7.0	27,000	110	590	-
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	1,000	1-4-0
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000	2-4-0
R-601	$CH_3CH_2CH_2CH_2CH_3$	pentane	A3	0.18	1,000	2.9	600	—
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600	—
R-610	ethoxyethane (ethyl ether)	$CH_3CH_2OCH_2CH_3$	—	—	—	—	400	—
R-611	methyl formate	$HCOOCH_3$	B2	—	—	—	100	—

R-717	NH_3	ammonia	B2[f]	0.014	320	0.22	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	B1	0.25	1,000	4	200	-
R-1132a	CF2=CH2	1,1-difluoroethylene	A2	2.0	13,000	33	500	-
R-1150	CH_2=CH_2	ethene (ethylene)	A3	—	—	—	200	1-4-2
R-1224yd(Z)	CF3CF=CHCl	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	360	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	A2[f]	4.7	16,000	75	500	—
R-1234ze(E)	CF_3CH=CHF	trans-1,3,3,3-tetrafluoro-1 -propene	A2[f]	4.7	16,000	75	800	—
R-1270	CH_3CH=CH_2	Propene (propylene)	A3	0.1	1,000	1.7	500	1-4-1
R-1336mzz(Z)	CF3CHCHCF3	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	5.4	13,000	87.0	500	-

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

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.
b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.
c. For installations that are entirely outdoors, use 3-1-0.
d. Class I ozone depleting substance; prohibited for new installations.
e. 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.
f. The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.

Reason: The Refrigerant Classifications (except Degrees of Hazard) are determined by ASHRAE SSPC 34 and published in ASHRAE Standard 34. This proposal seeks to update the refrigerant table with the new refrigerants added to Standard 34 since the last code cycle. The reasons for the additions of new refrigerants can be found at https://www.ashrae.org/standards-research–technology/standards-addenda. All proposed changes are either incorporated into ASHRAE Standard 34-2016 or the published addenda to ASHRAE Standard 34-2016 located at the link above.

Bibliography: AHRAE Standard 34-2016
Addenda a, b, c, d, f, w, ak, al, am, an to ASHRAE Standard 34-2016 - https://www.ashrae.org/standards-research--technology/standards-addenda

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Updating the table of refrigerants that could be used in systems does not add labor or material costs because the choice of refrigerant is up to the owner and designer.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

CHEMICAL REFRIGERANTFORMULACHEMICAL NAME OF BLENDREFRIGERANTCLASSIFICATIONAMOUNT OF REFRIGERANT PER OCCUPIED SPACE[F] DEGREES OF HAZARD

Pounds per 1,000cubic feetppmg/m^3 OEL[e]
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

Committee Reason: Approval was based on the proponent's published reason statement. The modification adds an update to the update proposal from ASHRAE 34. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M89-18	**AM**

M8518/M93-18

Date Submitted 2/5/2021	**Section** 1101.1	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** No	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

1101.1.1, 1101.1.2, 1101.6, Table 1103.1, 1104.2.2, 1104.3.3, 1104.3.4, 1105.6.3, 1105.9, 1106.4, 1108.2

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

Modification of multiple sections and Table 1103.1 "Refrigerant Classification Amount and OEL". To address the regulation of ammonia refrigeration.

Rationale

IIAR is an ANSI accredited standards developer with a complete suite of standards to regulate ammonia refrigeration from initial design through decommissioning of systems. IIAR standards adopted by the IMC and IFC comprehensively regulate ammonia refrigeration, and there is no need to continue the complexity of overlapping requirements in the IMC.

When IIAR 2 was completely rewritten in 2014 to become both a code and a standard, a gap analysis was performed with the IMC and other model codes to confirm or facilitate alignment. The resulting IIAR 2 became a comprehensive document, intended to function as a standalone design regulation without reliance on a mechanical code. This is particularly valuable to jurisdictions in the U.S. and abroad that do not adopt a mechanical code.

A similar change was approved for the 2018 Uniform Mechanical Code. The 2018 UMC no longer covers ammonia refrigeration, instead deferring to IIAR standards. Likewise, ASHRAE is processing Addendum A to ASHRAE 15, which deletes ammonia refrigeration requirements from that standard

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1101.1 Scope. This chapter shall govern the design, installation, construction and repair of refrigeration systems that vaporize and liquefy a fluid during the refrigerating cycle. ~~Refrigerant piping design and installation, including pressure vessels and pressure relief devices, shall conform to this code.~~ Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

Add new text as follows:

1101.1.1 Refrigerants other than ammonia. Refrigerant piping design and installation, including pressure vessels and pressure relief devices, for systems containing a refrigerant other than ammonia shall comply with this chapter and ASHRAE 15.

1101.1.2 Ammonia refrigerant. Refrigeration systems using ammonia as the refrigerant shall comply with IIAR 2, IIAR 3, IIAR 4 and IIAR 5, and shall not be required to comply with this chapter.

Delete and substitute as follows:

~~**1101.6 General. Refrigeration systems shall comply with the requirements of this code and, except as modified by this code, ASHRAE 15. Ammonia-refrigerating systems shall comply with this code and, except as modified by this code, ASHRAE 15, IIAR 2, IIAR 3, IIAR 4 and IIAR 5.**~~

1101.6 General. Refrigeration systems shall comply with the requirements of this code and, except as modified by this code, ASHRAE 15. Ammonia-refrigerating systems shall comply with this code and, except as modified by this code, ASHRAE 15, IIAR 2, IIAR 3, IIAR 4 and IIAR 5.

Revise as follows:

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

HEMICAL EFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DE OF HA
				Pounds per 1,000cubic feet	ppm	g/m^3	OEL[e]	
-11[d]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.2	C1,000	2-0
-12[d]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	1,000	2-0
-13[d]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—	1,000	2-0
-13B1[d]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—	1,000	2-0
-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400	1,000	2-0
-22	$CHClF_2$	chlorodifluoromethane	A1	13	59,000	210	1,000	2-0
-23	CHF_3	trifluoromethane (fluoroform)	A1	7.3	41,000	120	1,000	2-0
-30	CH_2Cl_2	dichloromethane (methylene chloride)	B1	—	—	—	—	—
-32	CH_2F_2	difluoromethane (methylene fluoride)	A2[f,g]	4.8	36,000	77	1,000	1-4
-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—	—	—
-50	CH_4	methane	A3	—	—	—	1,000	—
-113[d]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20	1,000	2-0
-114[d]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140	1,000	2-0
-115	$CClF_2CF_3$	chloropentafluoroethane	A1	47	120,000	760	1,000	—
-116	CF_3CF_3	hexafluoroethane	A1	34	97,000	550	1,000	1-0
-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57	50	2-0
-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56	1,000	2-0
-125	CHF_2CF_3	pentafluoroethane	A1	23	75,000	370	1,000	2-0
-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	13	50,000	210	1,000	2-0
-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	0.78	2,600	12	500	2-1
-142b	CH_3CClF_2	1-chloro-1, 1-difluoroethane	A2	5.1	20,000	83	1,000	2-4
-143a	CH_3CF_3	1,1,1-trifluoroethane	A2[f,g]	4.5	21,000	70	1,000	2-0
-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	1,000	1-4
-170	CH_3CH_3	ethane	A3	0.54	7,000	8.7	1,000	2-4
-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	1,000	—
-218	$CF_3CF_2CF_3$	octafluoropropane	A1	43	90,000	690	1,000	2-0
-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	36	84,000	580	1,000	—
-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	21	55,000	340	1,000	2-0
-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190	300	2-0
-290	$CH_3CH_2CH_3$	propane	A3	0.56	5,300	9.5	1,000	2-4
-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	41	80,000	660	1,000	—
-400[d]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	1,000	2-0
-400[d]	zeotrope	R-12/114 (60.0/40.0)	A1	11	30,000	170	1,000	—
-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	6.6	27,000	110	1,000	2-0
-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120	1,000	2-0
-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84	1,000	2-0
-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270	1,000	2-0
-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240	1,000	2-0
-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120	1,000	2-0
-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	70,000	290	1,000	2-0
-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500	1,000	2-0
-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/2.5)	—	16	57,000	260	1,000	—
-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	25	1,000	—
-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300	1,000	2-0
-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330	1,000	2-0
-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290	1,000	2-0
-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250	1,000	2-0
-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280	1,000	2-0
-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	20	95,000	320	1,000	—
-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	95,000	340	1,000	2-0

-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110	1,000	2-0
-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120	1,000	2-0
-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420	1,000	2-0
-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430	1,000	2-0
-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	990	—
-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	980	—
-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	1,000	—
-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	94	1,000	—
-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	6.4	26,000	100	1,000	—
-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	6.0	23,000	95	1,000	—
-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	1,000	—
-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	1,000	—
-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	3.9	14,000	62	1,000	2-0
-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	3.5	13,000	56	1,000	2-0
-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	70	1,000	—
-417C	zeotrope	R-125/134a/600 (19.5/78.8/1.7)	A1	5.4	21,000	87	1,000	—
-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	1,000	—
-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	1,000	—
-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	1,000	—
-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	45,000	190	1,000	2-0
-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280	1,000	2-0
-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330	1,000	2-0
-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290	1,000	2-0
-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250	1,000	2-0
-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290	1,000	2-0
-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260	1,000	2-0
-422E	zeotrope	R-125/134a/600a (58.0/39.3/2.7)	A1	16	57,000	260	1,000	—
-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	310	1,000	2-0
-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	6.2	23,000	100	970	2-0
-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260	1,000	2-0
-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	A1	5.2	20,000	83	990	—
-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	18	79,000	290	1,000	2-1
-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	83,000	370	1,000	—
-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	1,000	—
-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	1,000	—
-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.69	5,500	11	1,000	—
-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	700	—
-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	880	—
-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.51	4,500	8.1	950	—
-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.6	790	—
-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	20	73,000	320	1,000	—
-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	1.1	8,500	17	1,000	—
-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	1,000	—
-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	1,000	—
-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.0	19,000	82	990	—
-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	—
-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	4.7	26,000	76	990	—
-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	1,000	—
-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	0.39	3,200	6.3	1,000	—
-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	—
-443A	zeotrope	R-1270/290/600a (55.0/40.0/5.0)	A3	0.19	1,700	3.1	580	—
-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2 [f, g]	5.1	21,000	81	850	—
-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2 [f, g]	4.3	23,000	69	890	—
-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2 [f, g]	4.2	16,000	67	930	—
-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2 [f, g]	2.5	16,000	39	960	—
-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2 [f, g]	2.6	16,000	42	900	—
-448A	zeotrope	R- 32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)	A1	24	110,000	390	890	—
-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	830	—
-450A	zeotrope	R-134a/1234ze(E) (42.0/58.0)	A1	20	72,000	320	880	—
-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2 [f, g]	5.3	18,000	81	520	—
-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2 [f, g]	5.3	18,000	81	530	—
-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	100,000	440	780	—
-500 [e]	azeotrope	R-12/152a (73.8/26.2)	A1	7.6	30,000	120	1,000	2-0
-501 [d]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	1,000	—
-502 [e]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	1,000	2-0
-503 [e]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	1,000	2-0
-504 [d]	azeotrope	R-32/115 (48.2/51.8)	—	28	140,000	450	1,000	—
-507A	azeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	520	1,000	2-0
-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220	1,000	2-0
-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200	1,000	2-0
-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	390	1,000	2-0

-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	1,000	—
-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	1,000	—
-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	1,000	—
-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320	650	—
-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	1,000	1-4
-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000	2-4
-601	$CH_3CH_2CH_2CH_2CH_3$	pentane	A3	0.18	1,000	2.9	600	—
-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600	—
-610	ethoxyethane (ethyl ether)	$CH_3CH_2OCH_2CH_3$	—	—	—	—	400	—
-611	methyl formate	$HCOOCH_3$	B2	—	—	—	100	—
~~-717~~	~~NH_3~~	~~ammonia~~	~~B2[f]~~	~~0.014~~	~~320~~	~~0.22~~	~~25~~	~~3-3~~
-718	H_2O	water	A1	—	—	—	—	0-0
-744	CO_2	carbon dioxide	A1	4.5	40,000	72	5,000	2-0
-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	200	1-4
-1233zd(E)	$CF_3CH=CHCl$	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85	800	—
-1234yf	$CF_3CF=CH_2$	2,3,3,3-tetrafluoro-1 propene	A2[~~f~~][g]	4.7	16,000	75	500	—
-1234ze(E)	$CF_3CH=CHF$	trans-1,3,3,3-tetrafluoro-1 -propene	A2[~~f~~][g]	4.7	16,000	75	800	—
-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7	500	1-4

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

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

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

c. ~~For installations that are entirely outdoors, use 3-1-0.~~ The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.

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

e. 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.

~~f. The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.~~

1104.2.2 Industrial occupancies and refrigerated rooms. This section applies only to rooms and spaces that: are within industrial occupancies; contain a refrigerant evaporator; are maintained at temperatures below 68°F (20°C); and are used for manufacturing, food and beverage preparation, meat cutting, other processes and storage. Where a machinery room would otherwise be required by Section 1104.2, a machinery room shall not be required where all of the following conditions are met:

1. The space containing the machinery is separated from other occupancies by tight construction with tight-fitting doors.
2. Access is restricted to authorized personnel.
3. Refrigerant detectors are installed as required for machinery rooms in accordance with Section 1105.3.

~~Exceptions~~ Exception:

~~1.~~ Refrigerant detectors are not required in unoccupied areas that contain only continuous piping that does not include valves, valve assemblies, equipment, or equipment connections.

~~2. Where approved alternatives are provided, refrigerant detectors for ammonia refrigeration are not required for rooms or areas that are always occupied, and for rooms or areas that have high humidity or other harsh environmental conditions that are incompatible with detection devices.~~

4. Surfaces having temperatures exceeding 800°F (427°C) and open flames are not present where any Group A2, B2, A3 or B3 refrigerant is used (see Section 1104.3.4).

5. All electrical equipment and appliances conform to Class 1, Division 2, hazardous location classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant ~~, other than ammonia,~~ in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.

6. All refrigerant-containing parts in systems with a total connected compressor power exceeding 100 horsepower (hp) (74.6 kW) except evaporators used for refrigeration or dehumidification, condensers used for heating, control and pressure relief valves for either, low-probability pumps and connecting piping are located either outdoors or in a machinery room.

1104.3.3 All occupancies. The total of all Group A2, B2, A3 and B3 refrigerants ~~other than R-717, ammonia,~~ shall not exceed 1,100 pounds (499 kg) except where approved.

1104.3.4 Protection from refrigerant decomposition. Where any device having an open flame or surface temperature greater than 800°F (427°C) is used in a room containing more than 6.6 pounds (3 kg) of refrigerant in a single independent circuit, a hood and exhaust system shall be provided in accordance with Section 510. Such exhaust system shall exhaust combustion products to the outdoors.

Exception: A hood and exhaust system shall not be required where any of the following apply:

1. The refrigerant is R-~~717, R-~~ 718 or R-744.

2. The combustion air is ducted from the outdoors in a manner that prevents leaked refrigerant from being combusted.

1105.6.3 Ventilation rate. ~~For other than ammonia systems, the mechanical~~ Mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. ~~The minimum required emergency ventilation rate for ammonia shall be 30 air changes per hour in accordance with IIAR2.~~ Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

Delete without substitution:

~~**1105.8 Ammonia discharge. Pressure relief valves for ammonia systems shall discharge in accordance with ASHRAE 15.**~~

Revise as follows:

[F] 1105.9 Emergency pressure control system. ~~Permanently installed refrigeration systems containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant or ammonia~~ Emergency pressure control systems shall be provided ~~with an emergency pressure control system~~ in accordance with Section 605.10 of the International Fire Code.

Delete without substitution:

~~**1106.3 Ammonia room ventilation. Ventilation systems in ammonia machinery rooms shall be operated continuously at the ventilation rate specified in Section 1105.6.3.**~~

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~~**Exceptions:**~~

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1. ~~Machinery rooms equipped with a vapor detector that will automatically start the ventilation system at the ventilation rate specified in Section 1105.6.3, and that will actuate an alarm at a detection level not to exceed 1,000 ppm.~~

2. ~~Machinery rooms conforming to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.~~

Revise as follows:

1106.4 Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.

~~Exceptions~~ Exception:

1. ~~Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3.~~

~~2.~~ Machinery rooms for systems containing Group A2L refrigerants that are in accordance with Section 1106.5.

1108.2 Test gases. Tests shall be performed with an inert dried gas including, but not limited to, nitrogen and carbon dioxide. Oxygen, air, combustible gases and mixtures containing such gases shall not be used.

~~**Exception:** The use of air is allowed to test R-717, ammonia, systems provided that they are subsequently evacuated before charging with refrigerant.~~

Code Change No: M93-18

Original Proposal

Section(s): 1101.1, 1101.1.1 (New), 1101.1.2 (New), 1101.6, TABLE 1103.1, 1104.2.2, 1104.3.3, 1104.3.4, 1105.6.3, 1105.8, 1105.9, 1106.3, 1106.4, 1108.2

Proponents: Jeffrey Shapiro, representing International Institute of Ammonia Refrigeration (jeff.shapiro@intlcodeconsultants.com)

2018 International Mechanical Code

Revise as follows:

1101.1 Scope. This chapter shall govern the design, installation, construction and repair of refrigeration systems that vaporize and liquefy a fluid during the refrigerating cycle. ~~Refrigerant piping design and installation, including pressure vessels and pressure relief devices, shall conform to this code.~~ Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

Add new text as follows:

1101.1.1 Refrigerants other than ammonia. Refrigerant piping design and installation, including pressure vessels and pressure relief devices, for systems containing a refrigerant other than ammonia shall comply with this chapter and ASHRAE 15.

1101.1.2 Ammonia refrigerant. Refrigeration systems using ammonia as the refrigerant shall comply with IIAR 2, IIAR 3, IIAR 4 and IIAR 5, and shall not be required to comply with this chapter.

Delete and substitute as follows:

~~**1101.6 General.** Refrigeration systems shall comply with the requirements of this code and, except as modified by this code, ASHRAE 15. Ammonia-refrigerating systems shall comply with this code and, except as modified by this code, ASHRAE 15, IIAR 2, IIAR 3, IIAR 4 and IIAR 5.~~

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Revise as follows:

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000cubic feet	ppm	g/m^3	OEL[e]	
R-11 [d]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.2	C1,000	2-0-0 [b]
R-12 [d]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	1,000	2-0-0 [b]
R-13 [d]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—	1,000	2-0-0 [b]
R-13B1 [d]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—	1,000	2-0-0 [b]
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-32	CH_2F_2	difluoromethane (methylene fluoride)	A2 [f, g]	4.8	36,000	77	1,000	1-4-0
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—	—	—
R-50	CH_4	methane	A3	—	—	—	1,000	—
R-113 [d]	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 [d]	$CClF_2CClF_2$	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	500	2-1-0
R-142b	CH_3CClF_2	1-chloro-1, 1-difluoroethane	A2	5.1	20,000	83	1,000	2-4-0
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2 [f, g]	4.5	21,000	70	1,000	2-0-0 [b]
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	1,000	1-4-0
R-170	CH_3CH_3	ethane	A3	0.54	7,000	8.7	1,000	2-4-0
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	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	0.56	5,300	9.5	1,000	2-4-0
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	41	80,000	660	1,000	—
R-400 [d]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	1,000	2-0-0 [b]
R-400 [d]	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	70,000	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 (45.0/7.0/5.5/2.5)	—	16	57,000	260	1,000	—
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	25	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-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	95,000	340	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]
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	990	—
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	980	—
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	1,000	—
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	94	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	95	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	56	1,000	2-0-0 [b]
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	70	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	1,000	—
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	1,000	—

R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	1,000	—
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	45,000	190	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	310	1,000	2-0-0 [c]
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	970	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	83,000	370	1,000	—
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	1,000	—
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	1,000	—
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.69	5,500	11	1,000	—
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	700	—
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	880	—
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.51	4,500	8.1	950	—
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.6	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	1,000	—
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	1,000	—
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	1,000	—
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.0	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	990	—
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	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	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	580	—
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2 [f g]	5.1	21,000	81	850	—

R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2 [~~f~~ g]	4.3	23,000	69	890	—	
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2 [~~f~~ g]	4.2	16,000	67	930	—	
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2 [~~f~~ g]	2.5	16,000	39	960	—	
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2 [~~f~~ g]	2.6	16,000	42	900	—	
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	890	—	
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	830	—	
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)	A2 [~~f~~ g]	5.3	18,000	81	520	—	
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2 [~~f~~ g]	5.3	18,000	81	530	—	
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	100,000	440	780	—	
R-500 [e]	azeotrope	R-12/152a (73.8/26.2)	A1	7.6	30,000	120	1,000	2-0-0 [b]	
R-501 [d]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	1,000	—	
R-502 [e]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	1,000	2-0-0 [b]	
R-503 [e]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	1,000	2-0-0 [b]	
R-504 [d]	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	520	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	390	1,000	2-0-0 [b]	
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	1,000	—	
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	1,000	—	
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	1,000	—	
R-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320	650	—	
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	1,000	1-4-0	
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000	2-4-0	
R-601	$CH_3CH_2CH_2CH_2CH_3$	pentane	A3	0.18	1,000	2.9	600	—	
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600	—	
R-610	ethoxyethane (ethyl ether)	$CH_3CH_2OCH_2CH_3$	—	—	—	—	400	—	
R-611	methyl formate	$HCOOCH_3$	B2	—	—	—	100	—	
~~R-717~~	~~NH_3~~	~~ammonia~~	~~B2 [f]~~	~~0.014~~	~~320~~	~~0.22~~	~~25~~	~~3-3-0 [e]~~	
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-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	200	1-4-2	
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	A2 [~~f~~ g]	4.7	16,000	75	500	—	
R-1234ze(E)	$CF_3CH=CHF$	trans-1,3,3,3-tetrafluoro-1 -propene	A2 [~~f~~ g]	4.7	16,000	75	800	—	
R-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7	500	1-4-1	

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

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.
b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.
c. ~~For installations that are entirely outdoors, use 3-1-0.~~ The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.
d. Class I ozone depleting substance; prohibited for new installations.
e. 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.
~~f. The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.~~

1104.2.2 Industrial occupancies and refrigerated rooms. This section applies only to rooms and spaces that: are within industrial occupancies; contain a refrigerant evaporator; are maintained at temperatures below 68°F (20°C); and are used for manufacturing, food and beverage preparation, meat cutting, other processes and storage. Where a machinery room would otherwise be required by Section 1104.2, a machinery room shall not be required where all of the following conditions are met:

1. The space containing the machinery is separated from other occupancies by tight construction with tight-fitting doors.
2. Access is restricted to authorized personnel.
3. Refrigerant detectors are installed as required for machinery rooms in accordance with Section 1105.3.

   ~~Exceptions~~ Exception:

   ~~1.~~ Refrigerant detectors are not required in unoccupied areas that contain only continuous piping that does not include valves, valve assemblies, equipment, or equipment connections.
   ~~2. Where approved alternatives are provided, refrigerant detectors for ammonia refrigeration are not required for rooms or areas that are always occupied, and for rooms or areas that have high humidity or other harsh environmental conditions that are incompatible with detection devices.~~

4. Surfaces having temperatures exceeding 800°F (427°C) and open flames are not present where any Group A2, B2, A3 or B3 refrigerant is used (see Section 1104.3.4).
5. All electrical equipment and appliances conform to Class 1, Division 2, hazardous location classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant ~~, other than ammonia,~~ in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.
6. All refrigerant-containing parts in systems with a total connected compressor power exceeding 100 horsepower (hp) (74.6 kW) except evaporators used for refrigeration or dehumidification, condensers used for heating, control and pressure relief valves for either, low-probability pumps and connecting piping are located either outdoors or in a machinery room.

1104.3.3 All occupancies. The total of all Group A2, B2, A3 and B3 refrigerants ~~other than R-717, ammonia,~~ shall not exceed 1,100 pounds (499 kg) except where approved.

1104.3.4 Protection from refrigerant decomposition. Where any device having an open flame or surface temperature greater than 800°F (427°C) is used in a room containing more than 6.6 pounds (3 kg) of refrigerant in a single independent circuit, a hood and exhaust system shall be provided in accordance with Section 510. Such exhaust system shall exhaust combustion products to the outdoors.

Exception: A hood and exhaust system shall not be required where any of the following apply:

1. The refrigerant is R-~~717, R-~~ 718 or R-744.
2. The combustion air is ducted from the outdoors in a manner that prevents leaked refrigerant from being combusted.

1105.6.3 Ventilation rate. ~~For other than ammonia systems, the mechanical~~ Mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. ~~The minimum required emergency ventilation rate for ammonia shall be 30 air changes per hour in accordance with IIAR2.~~ Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

Delete without substitution:

~~**1105.8 Ammonia discharge. Pressure relief valves for ammonia systems shall discharge in accordance with ASHRAE 15.**~~

Revise as follows:

[F] 1105.9 Emergency pressure control system. ~~Permanently installed refrigeration systems containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant or ammonia~~ Emergency pressure control systems shall be provided ~~with an emergency pressure control system~~ in accordance with Section 605.10 of the International Fire Code.

Delete without substitution:

~~**1106.3 Ammonia room ventilation.** Ventilation systems in ammonia machinery rooms shall be operated continuously at the ventilation rate specified in Section 1105.6.3.~~

~~**Exceptions:**~~

1. ~~Machinery rooms equipped with a vapor detector that will automatically start the ventilation system at the ventilation rate specified in Section 1105.6.3, and that will actuate an alarm at a detection level not to exceed 1,000 ppm.~~
2. ~~Machinery rooms conforming to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.~~

Revise as follows:

1106.4 Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.

~~**Exceptions**~~ **Exception:**

~~1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3.~~

~~2.~~ Machinery rooms for systems containing Group A2L refrigerants that are in accordance with Section 1106.5.

1108.2 Test gases. Tests shall be performed with an inert dried gas including, but not limited to, nitrogen and carbon dioxide. Oxygen, air, combustible gases and mixtures containing such gases shall not be used.

~~**Exception:** The use of air is allowed to test R-717, ammonia, systems provided that they are subsequently evacuated before charging with refrigerant.~~

Reason: IIAR is an ANSI accredited standards developer with a complete suite of standards to regulate ammonia refrigeration from initial design through decommissioning of systems. IIAR standards adopted by the IMC and IFC comprehensively regulate ammonia refrigeration, and there is no need to continue the complexity of overlapping requirements in the IMC.

When IIAR 2 was completely rewritten in 2014 to become both a code and a standard, a gap analysis was performed with the IMC and other model codes to confirm or facilitate alignment. The resulting IIAR 2 became a comprehensive document, intended to function as a standalone design regulation without reliance on a mechanical code. This is particularly valuable to jurisdictions in the U.S. and abroad that do not adopt a mechanical code.

A similar change was approved for the 2018 Uniform Mechanical Code. The 2018 UMC no longer covers ammonia refrigeration, instead deferring to IIAR standards. Likewise, ASHRAE is processing Addendum A to ASHRAE 15, which deletes ammonia refrigeration requirements from that standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
IIAR standards are already adopted by the IMC, and thereby, compliance with these standards is already required. Deferral of ammonia systems to IIAR 2 will reduce the complexity of overlapping regulations and should not impact cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M93-18 **AS**

M8520/M95-18

Date Submitted 2/5/2021	**Section** 1101.2	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Table 1101.2, Reference Standards

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

Establishing a table to identify the standards that apply to the various types of equipment and appliances will assist in uniform application of this code requirement.

Rationale

Establishing a table to identify the standards that apply to the various types of equipment and appliances will assist in uniform application of this code requirement. Adding UL 109, UL 427, UL 474, UL 484, UL 60335-2-89, and UL 60335-2-40, which are standards used in testing and listing refrigeration equipment, will make the code complete.

Approved as Modified

Original Proposal:

2018 International Mechanical Code

Revise as follows:

1101.2 Factory-built equipment and appliances. Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with ~~UL 207, 412, 471 or 1995.~~ the applicable standards specified in Table 1101.2. Such equipment and appliances are deemed to meet the design, manufacture aand factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Add new text as follows:

Table 1101.2
Factory-built equipment and appliances

EQUIPMENT	STANDARD
Refrigeration fittings, including press-connect, flared, and threaded	UL 109 and UL 207
Air conditioning equipment	UL 1995 or UL/CSA 60335-2-40
Packaged terminal air conditioners	UL 484 or UL/CSA 60335-2-40
Split-system air conditioners	UL 1995 or UL/CSA 60335-2-40
Dehumidifiers	UL 474 or UL/CSA 60335-2-40
Unit coolers	UL 412 or UL/CSA 60335-2-89
Commercial refrigerators, freezers, beverage coolers, and walk-in coolers	UL 471 or UL/CSA 60335-2-89
Refrigerating units and walk-in coolers	UL 427 or UL 60335-2-89
Refrigerant-containing components and accessories	UL 207

Add new standard(s) as follows:

UL

109-97: Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service and Marine Use
427-11: Standard for Refrigerating Units
474-15: Standard for Dehumidifiers
484-14: Standard for Room Air Conditioners
60335-2-89-17: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor
UL/CSA 60335-2-40 -17: Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers.

Modify proposal:

EQUIPMENT	STANDARDS
Refrigeration fittings, including press-connect, flared, and threaded	UL 109 and UL 207
Air conditioning equipment	UL 1995 or UL/CSA 60335-2-40
Packaged terminal air conditioners and heat pumps	UL 484 or UL/CSA 60335-2-40
Split-system air conditioners <u>and heat pumps</u>	UL 1995 or UL/CSA 60335-2-40
Dehumidifiers	UL 474 or UL/CSA 60335-2-40
Unit coolers	UL 412 or UL/CSA 60335-2-89
Commercial refrigerators, freezers, beverage coolers, and walk-in coolers	UL 471 or UL/CSA 60335-2-89
Refrigerating units and walk-in coolers	UL 427 or UL 60335-2-89
Refrigerant-containing components and accessories	UL 207

-

Code Change No: M95-18

Original Proposal

Section(s): 1101.2, Table 1101.2 (New), Chapter 15

Proponents: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Mechanical Code

Revise as follows:

1101.2 Factory-built equipment and appliances. Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with ~~UL 207, 412, 471 or 1995.~~ the applicable standards specified in Table 1101.2. Such equipment and appliances are deemed to meet the design, manufacture aand factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

Add new text as follows:

Table 1101.2
Factory-built equipment and appliances

EQUIPMENT	STANDARD
Refrigeration fittings, including press-connect, flared, and threaded	UL 109 and UL 207
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Split-system air conditioners	UL 1995 or UL/CSA 60335-2-40
Dehumidifiers	UL 474 or UL/CSA 60335-2-40
Unit coolers	UL 412 or UL/CSA 60335-2-89
Commercial refrigerators, freezers, beverage coolers, and walk-in coolers	UL 471 or UL/CSA 60335-2-89
Refrigerating units and walk-in coolers	UL 427 or UL 60335-2-89
Refrigerant-containing components and accessories	UL 207

Add new standard(s) as follows:

UL

109-97: Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service and Marine Use
427-11: Standard for Refrigerating Units
474-15: Standard for Dehumidifiers
484-14: Standard for Room Air Conditioners
60335-2-89-17: Household and Similar Electrical Appliances - Safety - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor
UL/CSA 60335-2-40 -17: Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers.

Reason: Establishing a table to identify the standards that apply to the various types of equipment and appliances will assist in uniform application of this code requirement. Adding UL 109, UL 427, UL 474, UL 484, UL 60335-2-89, and UL 60335-2-40, which are standards used in testing and listing refrigeration equipment, will make the code complete.

Cost Impact: The code change proposal will decrease the cost of construction
Reduce costs by providing clarity

Analysis: A review of the standard proposed for inclusion in the code, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

EQUIPMENT	STANDARDS
Refrigeration fittings, including press-connect, flared, and threaded	UL 109 and UL 207
Air conditioning equipment	UL 1995 or UL/CSA 60335-2-40
Packaged terminal air conditioners and heat pumps	UL 484 or UL/CSA 60335-2-40
Split-system air conditioners <u>and heat pumps</u>	UL 1995 or UL/CSA 60335-2-40
Dehumidifiers	UL 474 or UL/CSA 60335-2-40
Unit coolers	UL 412 or UL/CSA 60335-2-89
Commercial refrigerators, freezers, beverage coolers, and walk-in coolers	UL 471 or UL/CSA 60335-2-89
Refrigerating units and walk-in coolers	UL 427 or UL 60335-2-89
Refrigerant-containing components and accessories	UL 207

Committee Reason: This cleans up the table and adds current standards. The modification adds heat pumps. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M95-18 **AM**

M8521/M99-18

Date Submitted 2/5/2021	**Section** 1107	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

1107, TABLE 1107.4 , 1107.5 , TABLE 1107.5 , SECTION 1108 SECTION 1109, Section 1110

Summary of Modification

Proposal to update all refrigerant piping requirements addressing every type of refrigerant system other than ammonia. This proposed change reorganizes and updates the requirements for refrigerant piping.

Rationale

It is the intent of the Refrigerant Piping Committee to submit a similar change to ASHRAE 15 and the UMC. The goal is to update all refrigerant piping requirements addressing every type of refrigerant system other than ammonia.

This proposed change reorganizes and updates the requirements for refrigerant piping. Many of the requirements remain the same as in the current code. The change follows the format used in other chapters in the Mechanical Code and Plumbing Code for listing piping material, joints and connections, and installation requirement.

Section 1107 remains the piping material section, however, the title is changed to be consistent with other chapters. There is no need to repeat refrigerant. Section 1107.1 is the general section indicating that compliance to the section for material requirements. The exception to Section 1107.1 is necessary to clarify that the ammonia piping requirements are regulated by IIAR 2. Without this statement, there could be confusion since Section 1101.6 states to apply IIAR 2 except as modified by this code. The piping requirements do not apply to ammonia systems. Similar exception language appears in Section 1109.1 and 1110.1.

There is currently no section regarding used materials, yet other chapters include requirements for used materials. This section is similar to the used material requirements in other chapters.

Approved as Modified by Public Comment 1

Original Proposal:

2018 International Mechanical Code

Delete and substitute as follows:

~~**SECTION 1107**~~
~~**REFRIGERANT PIPING**~~

-

SECTION 1107
PIPING MATERIAL

-

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.

-

1107.2 Used Materials. Used pipe, fittings, valves and other materials that are to be reused shall be clean and free of foreign materials and shall be approved for reuse.

-

1107.3 Material rating. Materials, joints and connections shall be rated for the operating temperature and pressure of the refrigerant system. Materials shall be suitable for the type of refrigerant and type of lubricant in the refrigerant system. Magnesium alloys shall not be used in contact with any halogenated refrigerants. Aluminum, zinc, magnesium, and their alloys shall not be used in contact with R-40 (methyl chloride).

-

1107.4 Piping materials standards. Refrigerant pipe shall conform to one or more of the standards listed in Table 1107.4. The exterior of the pipe shall be protected from corrosion and degradation.

-

TABLE 1107.4

REFRIGERANT PIPE

Piping Material	Standard (See Chapter 15)
Aluminum Tube	ASTM B210, ASTM B210M, ASTM B491/B491M
Brass (Copper Alloy) Pipe	ASTM B43
Copper Pipe	ASTM B42, ASTM B302
Copper Tube[a]	ASTM B68, ASTM B75, ASTM B88, ASTM B280, ASTM B819
Copper Linesets	ASTM B1003, ASTM B280
Steel Pipe[b]	ASTM A53, ASTM A106
Steel Tube	ASTM A254, ASTM A334

a. Soft annealed copper tubing larger than 1? in. (35 mm) O.D. shall not be used for field assembled refrigerant piping, unless it is protected from mechanical damage.

b. ASTM A53, Type F steel pipe shall not be used for refrigerant lines having an operating temperature less than -20°F (-29°C).

-

1107.4.1 Steel pipe Group A2, A3, B2, and B3. The minimum weight of steel pipe for Group A2, A3, B2, and B3 refrigerants shall be Schedule 80 for sizes 1-1/2 inch or less in diameter.

-

1107.5 Pipe fittings. Refrigerant pipe fittings shall be approved for installation with the piping materials to be installed,and shall conform to one of more of the standards listed in Table 1107.5 or shall be listed and labeled as complying with UL 207.

-

TABLE 1107.5

REFRIGERANT PIPE FITTINGS

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

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1107.5.1 Copper brazed field swaged. The minimum and maximum cup depth of field fabricated copper brazed swaged fitting connections shall comply with Table 1107.5.1.

-

TABLE 1107.5.1

COPPER BRAZED SWAGED CUP DEPTHS

Fitting Size (Inch)	Minimum Depth (Inch)	Maximum Depth (Inch)
1/8	0.15	0.23
3/16	0.16	0.24
1/4	0.17	0.26
3/8	0.20	0.30
1/2	0.22	0.33
5/8	0.24	0.36
3/4	0.25	0.38
1	0.28	0.42
1-1/4	0.31	0.47
1-1/2	0.34	0.51
2	0.40	0.60
2-1/2	0.47	0.71
3	0.53	0.80
3-1/2	0.59	0.89
4	0.64	0.96

1107.6 Valves. Valves shall be of materials that are compatible with the type of piping material, refrigerants, and oils in the system. Valves shall be listed and labeled and rated for the temperatures and pressures of the refrigerant systems in which the valves are installed.

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1107.7 Flexible connectors, expansion and vibration compensators. Flexible connectors and expansion and vibration control devices shall be listed and labeled for use in refrigerant systems.

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SECTION 1108
JOINTS AND CONNECTIONS

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1108.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the refrigerant system when tested in accordance with Section 1110.

-

1108.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved adapter fittings. Joints between dissimilar metallic piping materials shall be made with a dielectric fitting or a dielectric union conforming to dielectric tests of ASSE 1079. Adapter fittings with threaded ends between different materials shall be joined with thread lubricant in accordance with Section 1108.3.4.

-

1108.2 Preparation of pipe ends. Pipe shall be cut square, reamed and chamfered, and shall be free of burrs and obstructions. Pipe ends shall have full-bore openings and shall not be undercut.

1108.3 Joint preparation and installation. Where required by Sections 1108.4 through 1108.9, the preparation and installation of brazed, flared, mechanical, press-connect, soldered, threaded and welded joints shall comply with Sections 1108.3.1 through 1108.3.5.

-

1108.3.1 Brazed joints. Joint surfaces shall be cleaned. An approved flux shall be applied where required by the braze filler metal manufacturer. The piping being brazed shall be purged of air to remove the oxygen and filled with one of the following inert gases: oxygen-free nitrogen, helium, or argon. The piping system shall be pre-purged with an inert gas for a minimum time corresponding to five volume changes through the piping system prior to brazing. The pre-purge rate shall be at a minimum velocity of 100 feet per minute. The inert gas shall be directly connected to the tube system being brazed to prevent the entrainment of ambient air. After the pre-purge, the inert gas supply shall be maintained through the piping during the brazing operation at a minimum pressure of 1.0 psi and a maximum pressure of 3.0 psi. The joint shall be brazed with a filler metal conforming to AWS A5.8.

-

1108.3.2 Mechanical Joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

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1108.3.2.1 Flared Joints. Flared fittings shall be installed in accordance with the manufacturer's instructions. The flared fitting shall be used with the tube material specified by the fitting manufacturer. The flared tube end shall be made by a tool designed for that operation.

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1108.3.2.2 Press-connect joints. Press-connect joints shall be installed in accordance with the manufacturer's instructions.

-

1108.3.3 Soldered joints. Joint surfaces to be soldered shall be cleaned and a flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. Solder joints shall be limited to refrigerant systems using Group A1 refrigerant and having a pressure of less than or equal to 200 psi.

-

1108.3.4 Threaded joints. Threads shall conform to ASME B1.20.1, ASME B1.20.3, ASME B1.13M, or ASME B1.1. Thread lubricant, pipe-joint compound, or thread tape shall be applied on the external threads only and shall be approved for application on the piping material.

-

1108.3.5 Welded joints. Joint surfaces to be welded shall be cleaned by an approved procedure. Joints shall be welded with an approved filler metal.

1108.4 Aluminum tube. Joints between aluminum tubing or fittings shall be brazed, mechanical, press-connect, or welded joints conforming to Section 1108.3.

-

1108.5 Brass (copper alloy) pipe. Joints between brass pipe or fittings shall be brazed, mechanical, press-connect, threaded, or welded joints conforming to Section 1108.3.

-

1108.6 Copper pipe. Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, press-connect, soldered, threaded, or welded joints conforming to Section 1108.3.

-

1108.7 Copper tube. Joints between copper or copper-alloy tubing or fittings shall be brazed, flared, mechanical, press-connect, or soldered joints.

-

1108.8 Steel pipe. Joints between steel pipe or fittings shall be mechanical joints, threaded, press-connect, or welded joints conforming to Section 1108.3.

-

1108.9 Steel tube. Joints between steel tubing or fittings shall be flared, mechanical, press-connect, or welded joints conforming to Section 1108.3.

-

SECTION 1109
REFRIGERANT PIPE INSTALLATION

-

1109.1 General. Refrigerant piping installations, other than R-717 (ammonia) refrigeration systems, shall comply with the requirements of this section. The design of refrigerant piping shall be in accordance with ASME B31.5.

-

1109.2 Piping location. Refrigerant piping shall comply with the installation location requirements of Sections 1109.2.1 through 1109.2.6. Refrigerant piping for group A2L and B2L shall also comply with the requirements of Section 1109.3. Refrigerant piping for group A2, A3, B2 and B3 shall also comply with the requirements of Section 1109.4.

-

1109.2.1 Minimum height. Exposed refrigerant piping installed in open spaces that afford passage shall be not less than 7 feet 3 inches (2210 mm) above the finished floor.

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 (1830 mm) of the refrigerant unit or appliance.
3. Where located in a machinery room complying with Section 1105.

-

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. Interior exit stairway,
3. Interior exit ramp,
4. Exit passageway, or
5. Elevator, dumbwaiter or other shaft containing a moving object.

1109.2.4 Piping in concrete floors. Refrigerant piping installed in concrete floors shall be encased in pipe, conduit, or ducts. The piping shall be protected to prevent damage from vibration, stress and corrosion.

-

1109.2.5 Refrigerant pipe shafts. Refrigerant piping that penetrates two or more floor/ceiling assemblies shall be enclosed in a fire-resistance-rated shaft enclosure. The fire-resistance-rated shaft enclosure shall comply with Section 713 of the International Building Code.

-

Exceptions:

-

1. For systems using R718 refrigerant.
2. Piping in a direct system using Group A1 refrigerant where the refrigerant quantity does not exceed the limits of Table 1103.1 for the smallest occupied space through which the piping passes.
3. Piping located on the exterior of the building where vented to the outdoors.

-

1109.2.6 Exposed piping surface temperature. Exposed piping with ready access having surface temperatures greater than 120°F (49°C) or less than 5°F (-15°C) 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).

-

1109.3 Installation requirements for A2L and B2L refrigerants. Piping systems using Group A2L or B2L refrigerant shall comply with the requirements of Sections 1109.3.1 through 1109.3.3.

-

1109.3.1 Pipe protection. In addition to the requirements of Section 305.5, aluminum, copper, and steel tube used for Group A2L and B2L 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 inches (38 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) shall cover the area of the tube plus the area extending not less than 2 inches beyond both sides of the tube.

-

1109.3.2 Shaft ventilation. Refrigerant pipe shafts with systems using Group A2L or B2L refrigerants shall be naturally or mechanically ventilated. 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 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.

-

TABLE 1109.3.2

SHAFT VENTILATION VELOCITY

Cross Sectional Area of Shaft (sq. in.)	Minimum Ventilation Velocity (feet per minute)
= 20	100
> 20 - = 250	200
> 250 - = 1250	300
> 1250	400

-

1109.3.3 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 on the refrigerant piping or pipe insulation. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group B2L refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The minimum height of lettering of the identification label shall be ½ inch.

-

1109.4 Installation requirements for A2, A3, B2, and B3 refrigerants. Piping systems using Group A2, A3, B2, or B3 refrigerant shall comply with the requirements of Section 1109.4.1 through 1109.4.3.

1109.4.1 Piping material. Piping material for Group A2, A3, B2, or B3 refrigerant located inside the building, except for machinery rooms, shall be copper pipe, brass pipe, or steel pipe. Pipe joints located in areas other than the machinery room shall be welded. Self-contained listed and labeled equipment or appliances shall have piping material based on the listing requirements.

-

1109.4.3 Shaft ventilation. Refrigerant pipe shafts with systems using Group A2, A3, B2, or B3 refrigerants shall be continuously mechanically ventilated. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Mechanically ventilated shafts shall have a minimum airflow velocity as specified in Table 1109.3.2. 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.

-

1109.4.3 Pipe identification. Refrigerant pipe shall be identified with the refrigerant designation and safety group classification of refrigerant used in the piping system and the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For Group B2 and B3 refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The identification shall be at intervals not exceeding 5 feet on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be 1 inch.

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1109.5 Refrigerant pipe penetrations. The annular space between the outside of a refrigerant pipe and the inside of a pipe sleeve or opening in a building envelope wall, floor, or ceiling assembly penetrated by a refrigerant pipe shall be sealed in an approved manner with caulking material, foam sealant or closed with a gasketing system. The caulking material, foam sealant or gasketing system shall be designed for the conditions at the penetration location and shall be compatible with the pipe, sleeve and building materials in contact with the sealing materials. Refrigerant pipes penetrating fire-resistance-rated assemblies or membranes of fire-resistance-rated assemblies shall be sealed or closed in accordance with Section 714 of the International Building Code.

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1109.6 Stress and strain. Refrigerant piping shall be installed so as to prevent strains and stresses that exceed the structural strength of the pipe. Where necessary, provisions shall be made to protect piping from damage resulting from vibration, expansion, contraction, and structural settlement.

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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.

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1109.8 Stop valves. Stop valves shall be installed in specified locations in accordance with Sections 1109.8.1 and 1109.8.2. Stop valves shall be supported in accordance with Section 1109.8.3 and identified in accordance with Section 1109.8.4.

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Exceptions:

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1. Systems that have a refrigerant pump out function capable of storing the entire refrigerant charge in a receiver or heat exchanger.
2. Systems that are equipped with provisions for pump out of the refrigerant using either portable or permanently installed refrigerant recovery equipment.
3. Self-contained listed and labeled systems.

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1109.8.1 Refrigerating systems containing more than 6.6 pounds (3.0 kg) of refrigerant. Stop valves shall be installed in the following locations on refrigerating systems containing more than 6.6 pounds (3.0 kg) of refrigerant:

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1. The suction inlet of each compressor, compressor unit or condensing unit.

2. The discharge outlet of each compressor, compressor unit or condensing unit.

3. The outlet of each liquid receiver.

1109.8.2 Refrigerating systems containing more than 100 pounds (45 kg) of refrigerant. In addition to stop valves required by Section 1109.8.1, systems containing more than 100 pound (45 kg) of refrigerant shall have stop valves installed in the following locations:

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1. Each inlet of each liquid receiver.

2. Each inlet and each outlet of each condenser, where more than one condenser is used in parallel

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Exceptions:

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1. Stop valves shall not be required on the inlet of a receiver in a condensing unit, nor on the inlet of a receiver that is an integral part of the condenser.

2. Systems utilizing nonpositive displacement compressors.

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1109.8.3 Stop valve support. Stop valves shall be supported to prevent detrimental stress and strain on the refrigerant piping system. The piping system shall not be utilized to support stop valves on copper tubing or aluminum tubing 1 inch (25.4 mm) OD or larger in diameter.

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1109.8.4 Identification. Stop valves shall be identified where their intended purpose is not obvious. Where valves are identified by a numbering or lettering system, legend(s) or key(s) for the valve identification shall be located in the room containing the indoor refrigeration equipment. The minimum height of lettering of the identification label shall be ½ inch (12.7 mm).

~~SECTION 1108~~
~~FIELD TEST~~

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SECTION 1110
REFRIGERANT PIPING SYSTEM TEST

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1110.1 General. Refrigerant piping systems, other than R-717 (ammonia) refrigeration systems, that are erected in the field, shall be pressure tested for strength and leak tested for tightness, in accordance with the requirements of this section, after installation and before being placed in operation. Tests shall include both the high and low-pressure sides of each system.

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Exception: Listed and labeled equipment, including compressors, condensers, vessels, evaporators, gas bulk storage tanks, safety devices, pressure gauges and control mechanisms, shall not be required to be tested.

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1110.2 Exposure of refrigerant piping system. Refrigerant pipe and joints installed in the field shall be exposed for visual inspection and testing prior to being covered or enclosed.

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1110.3 Test gases. The medium used for pressure testing the refrigerant system shall be one of the following inert gases: oxygen-free nitrogen, helium, or argon. For R-744 refrigerant systems carbon dioxide shall be allowed as the test medium. For R-718 refrigerant systems water shall be allowed as the test medium. Oxygen, air, combustible gases and mixtures containing such gases shall not be used as test medium. Systems erected on the premises with tubing not exceeding 5/8 inch (15.8 mm) OD shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.

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1110.4 Test apparatus. The means used to pressurize the refrigerant piping system shall have on its outlet side, a test pressure measuring device and either a pressure-limiting device or a pressure-reducing device. The test pressure measuring device shall have an accuracy of ±3 percent or less of the test pressure, and shall have a resolution of 5% or less of the test pressure.

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1110.5 Piping system pressure test and leak 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:

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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 1500 microns for a period of not less than 10 minutes.

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1110.5.1 Joints and refrigerant-containing parts in air ducts. Joints and all refrigerant-containing parts of a refrigerating system located in an air duct of an air-conditioning system that conveys conditioned air to and from human-occupied spaces shall be tested at a pressure of 150 percent of the higher of the design pressure or pressure relief device setting.

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1110.5.2 Limited charge systems. Limited-charge systems with a pressure relief device, erected on the premises, shall be tested at a pressure not less than one and one-half times the pressure setting of the relief device. Listed and labeled limited charge systems shall be tested at the equipment or appliance design pressure.

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1110.6 Booster compressor. Where a compressor protected by a pressure relief device is used as a booster to obtain an intermediate pressure and such compressor discharges into the suction side of another compressor, the booster compressor shall be considered to be a part of the low pressure side of the system.

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1110.7 Centrifugal/nonpositive displacement compressors. Where testing systems using centrifugal or other nonpositive displacement compressors, the entire system shall be considered to be the low pressure-side for test purposes.

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1110.8 Contractor or engineer declaration. The installing contractor or registered design professional of record shall issue a certificate of test to the code official for all systems containing 55 pounds (25 kg) or more of refrigerant. The certificate shall give the test date, name of the refrigerant, test medium, and the field test pressure applied to the high pressure-side and the low pressure-side of the system. The certification of test shall be signed by the installing contractor or registered design professional and shall be made part of the public record.

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Public Comment 1 Proposal:

2018 International Mechanical Code

1109.2 Piping location. Refrigerant piping shall comply with the installation location requirements of Sections 1109.2.1 through ~~1109.2.6~~ 1109.2.7. Refrigerant piping for group A2L and B2L shall also comply with the requirements of Section 1109.3. Refrigerant piping for group A2, A3, B2 and B3 shall also comply with the requirements of Section 1109.4.

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 on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be ½ inch. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2, A3, B2, and B3 refrigerant 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."

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~~**1109.3.3 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 on the refrigerant piping or pipe insulation. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group B2L refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The minimum height of lettering of the identification label shall be ½ inch.~~

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~~**1109.4.3 Pipe identification.** Refrigerant pipe shall be identified with the refrigerant designation and safety group classification of refrigerant used in the piping system and the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For Group B2 and B3 refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The identification shall be at intervals not exceeding 5 feet on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be 1 inch.~~

Code Change No: M99-18

Original Proposal

Section(s): 1107, 1107.1 (New), 1107.2 (New), 1107.3 (New), 1107.4 (New), TABLE 1107.4 (New), 1107.4.1 (New), 1107.5 (New), TABLE 1107.5 (New), 1107.5.1 (New), TABLE 1107.5.1 (New), 1107.6 (New), 1107.7 (New), SECTION 1108 (New), 1108.1 (New), 1108.1.1 (New), 1108.2 (New), 1108.3 (New), 1108.3.1 (New), 1108.3.2 (New), 1108.3.2.1 (New), 1108.3.2.2 (New), 1108.3.3 (New), 1108.3.4 (New), 1108.3.5 (New), 1108.4 (New), 1108.5 (New), 1108.6 (New), 1108.7 (New), 1108.8 (New), 1108.9 (New), SECTION 1109 (New), 1109.1 (New), 1109.2 (New), 1109.2.1 (New), 1109.2.2 (New), 1109.2.3 (New), 1109.2.4 (New), 1109.2.5 (New), 1109.2.6 (New), 1109.3 (New), 1109.3.1 (New), 1109.3.2 (New), TABLE 1109.3.2 (New), 1109.3.3 (New), 1109.4 (New), 1109.4.1 (New), 1109.4.3 (New), 1109.5 (New), 1109.6 (New), 1109.7 (New), 1109.8 (New), 1109.8.1 (New), 1109.8.2 (New), 1109.8.3 (New), 1109.8.4 (New), 1110, 1110.1 (New), 1110.2 (New), 1110.3 (New), 1110.4 (New), 1110.5 (New), 1110.5.1 (New), 1110.5.2 (New), 1110.6 (New), 1110.7 (New), 1110.8 (New)

Proponents: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Daikin US (Chair, Refrigerant Piping Committee) (JBENGINEER@aol.com)

2018 International Mechanical Code

Delete and substitute as follows:

~~**SECTION 1107**~~
~~**REFRIGERANT PIPING**~~

SECTION 1107
PIPING MATERIAL

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.

1107.2 Used Materials. Used pipe, fittings, valves and other materials that are to be reused shall be clean and free of foreign materials and shall be approved for reuse.

1107.3 Material rating. Materials, joints and connections shall be rated for the operating temperature and pressure of the refrigerant system. Materials shall be suitable for the type of refrigerant and type of lubricant in the refrigerant system. Magnesium alloys shall not be used in contact with any halogenated refrigerants. Aluminum, zinc, magnesium, and their alloys shall not be used in contact with R-40 (methyl chloride).

1107.4 Piping materials standards. Refrigerant pipe shall conform to one or more of the standards listed in Table 1107.4. The exterior of the pipe shall be protected from corrosion and degradation.

TABLE 1107.4
REFRIGERANT PIPE

Piping Material	Standard (See Chapter 15)
Aluminum Tube	ASTM B210, ASTM B210M, ASTM B491/B491M
Brass (Copper Alloy) Pipe	ASTM B43

Copper Pipe	ASTM B42, ASTM B302
Copper Tube[a]	ASTM B68, ASTM B75, ASTM B88, ASTM B280, ASTM B819
Copper Linesets	ASTM B1003, ASTM B280
Steel Pipe[b]	ASTM A53, ASTM A106
Steel Tube	ASTM A254, ASTM A334

a. **Soft annealed copper tubing larger than 1⅜ in. (35 mm) O.D. shall not be used for field assembled** refrigerant piping, unless it is protected from mechanical damage.

b. ASTM A53, Type F steel pipe shall not be used for refrigerant lines having an operating temperature less than -20°F (-29°C).

1107.4.1 Steel pipe Group A2, A3, B2, and B3. The minimum weight of steel pipe for Group A2, A3, B2, and B3 refrigerants shall be Schedule 80 for sizes 1-1/2 inch or less in diameter.

1107.5 Pipe fittings. Refrigerant pipe fittings shall be approved for installation with the piping materials to be installed,and shall conform to one of more of the standards listed in Table 1107.5 or shall be listed and labeled as complying with UL 207.

TABLE 1107.5
REFRIGERANT PIPE FITTINGS

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

1107.5.1 Copper brazed field swaged. The minimum and maximum cup depth of field fabricated copper brazed swaged fitting connections shall comply with Table 1107.5.1.

TABLE 1107.5.1
COPPER BRAZED SWAGED CUP DEPTHS

Fitting Size (Inch)	Minimum Depth (Inch)	Maximum Depth (Inch)
1/8	0.15	0.23
3/16	0.16	0.24
1/4	0.17	0.26
3/8	0.20	0.30
1/2	0.22	0.33
5/8	0.24	0.36
3/4	0.25	0.38
1	0.28	0.42
1-1/4	0.31	0.47
1-1/2	0.34	0.51
2	0.40	0.60

2-1/2	0.47	0.71
3	0.53	0.80
3-1/2	0.59	0.89
4	0.64	0.96

1107.6 Valves. Valves shall be of materials that are compatible with the type of piping material, refrigerants, and oils in the system. Valves shall be listed and labeled and rated for the temperatures and pressures of the refrigerant systems in which the valves are installed.

1107.7 Flexible connectors, expansion and vibration compensators. Flexible connectors and expansion and vibration control devices shall be listed and labeled for use in refrigerant systems.

SECTION 1108
JOINTS AND CONNECTIONS

1108.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the refrigerant system when tested in accordance with Section 1110.

1108.1.1 Joints between different piping materials. Joints between different piping materials shall be made with approved adapter fittings. Joints between dissimilar metallic piping materials shall be made with a dielectric fitting or a dielectric union conforming to dielectric tests of ASSE 1079. Adapter fittings with threaded ends between different materials shall be joined with thread lubricant in accordance with Section 1108.3.4.

1108.2 Preparation of pipe ends. Pipe shall be cut square, reamed and chamfered, and shall be free of burrs and obstructions. Pipe ends shall have full-bore openings and shall not be undercut.

1108.3 Joint preparation and installation. Where required by Sections 1108.4 through 1108.9, the preparation and installation of brazed, flared, mechanical, press-connect, soldered, threaded and welded joints shall comply with Sections 1108.3.1 through 1108.3.5.

1108.3.1 Brazed joints. Joint surfaces shall be cleaned. An approved flux shall be applied where required by the braze filler metal manufacturer. The piping being brazed shall be purged of air to remove the oxygen and filled with one of the following inert gases: oxygen-free nitrogen, helium, or argon. The piping system shall be pre-purged with an inert gas for a minimum time corresponding to five volume changes through the piping system prior to brazing. The pre-purge rate shall be at a minimum velocity of 100 feet per minute. The inert gas shall be directly connected to the tube system being brazed to prevent the entrainment of ambient air. After the pre-purge, the inert gas supply shall be maintained through the piping during the brazing operation at a minimum pressure of 1.0 psi and a maximum pressure of 3.0 psi. The joint shall be brazed with a filler metal conforming to AWS A5.8.

1108.3.2 Mechanical Joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1108.3.2.1 Flared Joints. Flared fittings shall be installed in accordance with the manufacturer's instructions. The flared fitting shall be used with the tube material specified by the fitting manufacturer. The flared tube end shall be made by a tool designed for that operation.

1108.3.2.2 Press-connect joints. Press-connect joints shall be installed in accordance with the manufacturer's instructions.

1108.3.3 Soldered joints. Joint surfaces to be soldered shall be cleaned and a flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. Solder joints shall be limited to refrigerant systems using Group A1 refrigerant and having a pressure of less than or equal to 200 psi.

1108.3.4 Threaded joints. Threads shall conform to ASME B1.20.1, ASME B1.20.3, ASME B1.13M, or ASME B1.1. Thread lubricant, pipe-joint compound, or thread tape shall be applied on the external threads only and shall be approved for application on the piping material.

1108.3.5 Welded joints. Joint surfaces to be welded shall be cleaned by an approved procedure. Joints shall be welded with an approved filler metal.

1108.4 Aluminum tube. Joints between aluminum tubing or fittings shall be brazed, mechanical, press-connect, or welded joints conforming to Section 1108.3.

1108.5 Brass (copper alloy) pipe. Joints between brass pipe or fittings shall be brazed, mechanical, press-connect, threaded, or welded joints conforming to Section 1108.3.

1108.6 Copper pipe. Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, press-connect, soldered, threaded, or welded joints conforming to Section 1108.3.

1108.7 Copper tube. Joints between copper or copper-alloy tubing or fittings shall be brazed, flared, mechanical, press-connect, or soldered joints.

1108.8 Steel pipe. Joints between steel pipe or fittings shall be mechanical joints, threaded, press-connect, or welded joints conforming to Section 1108.3.

1108.9 Steel tube. Joints between steel tubing or fittings shall be flared, mechanical, press-connect, or welded joints conforming to Section 1108.3.

SECTION 1109
REFRIGERANT PIPE INSTALLATION

1109.1 General. Refrigerant piping installations, other than R-717 (ammonia) refrigeration systems, shall comply with the requirements of this section. The design of refrigerant piping shall be in accordance with ASME B31.5.

1109.2 Piping location. Refrigerant piping shall comply with the installation location requirements of Sections 1109.2.1 through 1109.2.6. Refrigerant piping for group A2L and B2L shall also comply with the requirements of Section 1109.3. Refrigerant piping for group A2, A3, B2 and B3 shall also comply with the requirements of Section 1109.4.

1109.2.1 Minimum height. Exposed refrigerant piping installed in open spaces that afford passage shall be not less than 7 feet 3 inches (2210 mm) above the finished floor.

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 (1830 mm) of the refrigerant unit or appliance.
> 3. Where located in a machinery room complying with Section 1105.

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. Interior exit stairway,
3. Interior exit ramp,
4. Exit passageway, or
5. Elevator, dumbwaiter or other shaft containing a moving object.

1109.2.4 Piping in concrete floors. Refrigerant piping installed in concrete floors shall be encased in pipe, conduit, or ducts. The piping shall be protected to prevent damage from vibration, stress and corrosion.

1109.2.5 Refrigerant pipe shafts. Refrigerant piping that penetrates two or more floor/ceiling assemblies shall be enclosed in a fire-resistance-rated shaft enclosure. The fire-resistance-rated shaft enclosure shall comply with Section 713 of the International Building Code.

Exceptions:

1. For systems using R718 refrigerant.
2. Piping in a direct system using Group A1 refrigerant where the refrigerant quantity does not exceed the limits of Table 1103.1 for the smallest occupied space through which the piping passes.
3. Piping located on the exterior of the building where vented to the outdoors.

1109.2.6 Exposed piping surface temperature. Exposed piping with ready access having surface temperatures greater than 120°F (49°C) or less than 5°F (-15°C) 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).

1109.3 Installation requirements for A2L and B2L refrigerants. Piping systems using Group A2L or B2L refrigerant shall comply with the requirements of Sections 1109.3.1 through 1109.3.3.

1109.3.1 Pipe protection. In addition to the requirements of Section 305.5, aluminum, copper, and steel tube used for Group A2L and B2L 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 inches (38 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) shall cover the area of the tube plus the area extending not less than 2 inches beyond both sides of the tube.

1109.3.2 Shaft ventilation. Refrigerant pipe shafts with systems using Group A2L or B2L refrigerants shall be naturally or mechanically ventilated. 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 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.

TABLE 1109.3.2
SHAFT VENTILATION VELOCITY

Cross Sectional Area of Shaft (sq. in.)	Minimum Ventilation Velocity (feet per minute)
≤ 20	100
> 20 - **≤ 250**	200
> 250 - **≤ 1250**	300
> 1250	400

1109.3.3 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 on the refrigerant piping or pipe insulation. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group B2L refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The minimum height of lettering of the identification label shall be ½ inch.

1109.4 Installation requirements for A2, A3, B2, and B3 refrigerants. Piping systems using Group A2, A3, B2, or B3 refrigerant shall comply with the requirements of Section 1109.4.1 through 1109.4.3.

1109.4.1 Piping material. Piping material for Group A2, A3, B2, or B3 refrigerant located inside the building, except for machinery rooms, shall be copper pipe, brass pipe, or steel pipe. Pipe joints located in areas other than the machinery room shall be welded. Self-contained listed and labeled equipment or appliances shall have piping material based on the listing requirements.

1109.4.3 Shaft ventilation. Refrigerant pipe shafts with systems using Group A2, A3, B2, or B3 refrigerants shall be continuously mechanically ventilated. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Mechanically ventilated shafts shall have a minimum airflow velocity as specified in Table 1109.3.2. 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.

1109.4.3 Pipe identification. Refrigerant pipe shall be identified with the refrigerant designation and safety group classification of refrigerant used in the piping system and the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For Group B2 and B3 refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The identification shall be at intervals not exceeding 5 feet on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be 1 inch.

1109.5 Refrigerant pipe penetrations. The annular space between the outside of a refrigerant pipe and the inside of a pipe sleeve or opening in a building envelope wall, floor, or ceiling assembly penetrated by a refrigerant pipe shall be sealed in an approved manner with caulking material, foam sealant or closed with a gasketing system. The caulking material, foam sealant or gasketing system shall be designed for the conditions at the penetration location and shall be compatible with the pipe, sleeve and building materials in contact with the sealing materials. Refrigerant pipes penetrating fire-resistance-rated assemblies or membranes of fire-resistance-rated assemblies shall be sealed or closed in accordance with Section 714 of the International Building Code.

1109.6 Stress and strain. Refrigerant piping shall be installed so as to prevent strains and stresses that exceed the structural strength of the pipe. Where necessary, provisions shall be made to protect piping from damage resulting from vibration, expansion, contraction, and structural settlement.

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.

1109.8 Stop valves. Stop valves shall be installed in specified locations in accordance with Sections 1109.8.1 and 1109.8.2. Stop valves shall be supported in accordance with Section 1109.8.3 and identified in accordance with Section 1109.8.4.

Exceptions:

1. Systems that have a refrigerant pump out function capable of storing the entire refrigerant charge in a receiver or heat exchanger.
2. Systems that are equipped with provisions for pump out of the refrigerant using either portable or permanently installed refrigerant recovery equipment.
3. Self-contained listed and labeled systems.

1109.8.1 Refrigerating systems containing more than 6.6 pounds (3.0 kg) of refrigerant. Stop valves shall be installed in the following locations on refrigerating systems containing more than 6.6 pounds (3.0 kg) of refrigerant:

1. The suction inlet of each compressor, compressor unit or condensing unit.
2. The discharge outlet of each compressor, compressor unit or condensing unit.
3. The outlet of each liquid receiver.

1109.8.2 Refrigerating systems containing more than 100 pounds (45 kg) of refrigerant. In addition to stop valves required by Section 1109.8.1, systems containing more than 100 pound (45 kg) of refrigerant shall have stop valves installed in the following locations:

1. Each inlet of each liquid receiver.
2. Each inlet and each outlet of each condenser, where more than one condenser is used in parallel

Exceptions:

1. Stop valves shall not be required on the inlet of a receiver in a condensing unit, nor on the inlet of a receiver that is an integral part of the condenser.
2. Systems utilizing nonpositive displacement compressors.

1109.8.3 Stop valve support. Stop valves shall be supported to prevent detrimental stress and strain on the refrigerant piping system. The piping system shall not be utilized to support stop valves on copper tubing or aluminum tubing 1 inch (25.4 mm) OD or larger in diameter.

1109.8.4 Identification. Stop valves shall be identified where their intended purpose is not obvious. Where valves are identified by a numbering or lettering system, legend(s) or key(s) for the valve identification shall be located in the room containing the indoor refrigeration equipment. The minimum height of lettering of the identification label shall be ½ inch (12.7 mm).

~~SECTION 1108~~
~~FIELD TEST~~

SECTION 1110
REFRIGERANT PIPING SYSTEM TEST

1110.1 General. Refrigerant piping systems, other than R-717 (ammonia) refrigeration systems, that are erected in the field, shall be pressure tested for strength and leak tested for tightness, in accordance with the requirements of this section, after installation and before being placed in operation. Tests shall include both the high and low-pressure sides of each system.

Exception: Listed and labeled equipment, including compressors, condensers, vessels, evaporators, gas bulk storage tanks, safety devices, pressure gauges and control mechanisms, shall not be required to be tested.

1110.2 Exposure of refrigerant piping system. Refrigerant pipe and joints installed in the field shall be exposed for visual inspection and testing prior to being covered or enclosed.

1110.3 Test gases. The medium used for pressure testing the refrigerant system shall be one of the following inert gases: oxygen-free nitrogen, helium, or argon. For R-744 refrigerant systems carbon dioxide shall be allowed as the test medium. For R-718 refrigerant systems water shall be allowed as the test medium. Oxygen, air, combustible gases and mixtures containing such gases shall not be used as test medium. Systems erected on the premises with tubing not exceeding 5/8 inch (15.8 mm) OD shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.

1110.4 Test apparatus. The means used to pressurize the refrigerant piping system shall have on its outlet side, a test pressure measuring device and either a pressure-limiting device or a pressure-reducing device. The test pressure measuring device shall have an accuracy of ±3 percent or less of the test pressure, and shall have a resolution of 5% or less of the test pressure.

1110.5 Piping system pressure test and leak 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:

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 1500 microns for a period of not less than 10 minutes.

1110.5.1 Joints and refrigerant-containing parts in air ducts. Joints and all refrigerant-containing parts of a refrigerating system located in an air duct of an air-conditioning system that conveys conditioned air to and from human-occupied spaces shall be tested at a pressure of 150 percent of the higher of the design pressure or pressure relief device setting.

1110.5.2 Limited charge systems. Limited-charge systems with a pressure relief device, erected on the premises, shall be tested at a pressure not less than one and one-half times the pressure setting of the relief device. Listed and labeled limited charge systems shall be tested at the equipment or appliance design pressure.

1110.6 Booster compressor. Where a compressor protected by a pressure relief device is used as a booster to obtain an intermediate pressure and such compressor discharges into the suction side of another compressor, the booster compressor shall be considered to be a part of the low pressure side of the system.

1110.7 Centrifugal/nonpositive displacement compressors. Where testing systems using centrifugal or other nonpositive displacement compressors, the entire system shall be considered to be the low pressure-side for test purposes.

1110.8 Contractor or engineer declaration. The installing contractor or registered design professional of record shall issue a certificate of test to the code official for all systems containing 55 pounds (25 kg) or more of refrigerant. The certificate shall give the test date, name of the refrigerant, test medium, and the field test pressure applied to the high pressure-side and the low pressure-side of the system. The certification of test shall be signed by the installing contractor or registered design professional and shall be made part of the public record.

Reason: I organized a group of 8 experts in the field of refrigerant piping to help develop this code change. I refer to them as the Refrigerant Piping Committee. However, I am submitting this change as the proponent. In addition to the Committee I created, I circulated a draft to other experts in the field of refrigeration. I received a number of comments through that review. Those comments have been incorporated in the final text that I am submitting.

It is the intent of the Refrigerant Piping Committee to submit a similar change to ASHRAE 15 and the UMC. The goal is to update all refrigerant piping requirements addressing every type of refrigerant system other than ammonia.

This proposed change reorganizes and updates the requirements for refrigerant piping. Many of the requirements remain the same as in the current code. The change follows the format used in other chapters in the Mechanical Code and Plumbing Code for listing piping material, joints and connections, and installation requirement.

Section 1107 remains the piping material section, however, the title is changed to be consistent with other chapters. There is no need to repeat refrigerant. Section 1107.1 is the general section indicating that compliance to the section for material requirements. The exception to Section 1107.1 is necessary to clarify that the ammonia piping requirements are regulated by IIAR 2. Without this statement, there could be confusion since Section 1101.6 states to apply IIAR 2 except as modified by this code. The piping requirements do not apply to ammonia systems. Similar exception language appears in Section 1109.1 and 1110.1.

There is currently no section regarding used materials, yet other chapters include requirements for used materials. This section is similar to the used material requirements in other chapters.

Section 1107.3 is a general requirement for the piping material to be rated for the temperatures, pressures, and type of refrigerant. The aluminum exception for R-40 (methyl chloride) currently appears in Section 1107.5.5. The requirements have been expanded to include zinc and magnesium alloys since these materials are also susceptible to failure from R-40 (methyl chloride). Magnesium alloys cannot be used with any halogenated refrigerants since the material will react and fail. This prohibition has been added.

Section 1107.4 includes a table for listing all of the acceptable piping material. The appropriate standards for the piping material are listed in the table. While the word brass was previously convert to copper alloy throughout the code, ASTM B43 is still identified as a brass pipe standard. Therefore, brass was used with copper alloy included in parenthesis.

The current code has a restriction on the use of mechanical joints with annealed copper tubing. This is a hold over requirement that is out of date. ASME B31.5 has a different limitation. Note 1 to the table includes the requirements listed in ASME B31.5.

Note 2 of the table currently appears in Section 1107.5.1. The requirement remains the same.

Section 1107.5 includes a table of the fitting standards used in refrigerant piping systems. Some of the standards are new to this chapter since the previous requirements were weak with regard to referencing the appropriate fitting standards. There is also a general reference to UL 207. There are refrigerant fittings that do not meet the fitting standard, however, they are listed to UL 207. This is an appropriate standard for specialty type of refrigerant fittings.

Copper tubing is a common material used in refrigerant piping systems. A common joint is a swaged fitting which is made in the field. Since the swaging of copper expands the wall of the pipe, thus weakening the outer tube of the joint where not supported by the joint filler material and inner tube, the depth of the swage must be included. This depth is similar to the brazed fitting cup depths in the ASME B16.50 standard. The maximum depth allows a 50% increase in cup depth. A greater depth will result in too weak a pipe wall.

Section 1107.6 adds requirements for valves. The current code has valve installation requirements but is missing valve material requirements.

Section 1107.7 adds material requirements for flexible connectors and expansion and vibration compensators. These components are required to be listed and labeled for refrigerant systems.

Section 1108 is organized similar to the joints and connections section in Chapter 12. Many of the requirements are new since the current code requirements are not up to date. The section is organized with general requirements in the beginning, followed by joining methods, and completed with piping material allowances of various joining methods.

Section 1108.1 is the general section on joints requiring them to be approved and meet the tightness requirements to pass the system test.

Section 1108.1.1 lists requirements for joints between different materials. A reference to the testing requirements in ASSE 1079 is made in the section for joints between dissimilar metals. The standard has appropriate testing requirements for dielectric tests that can be used on refrigeration piping systems even though the standard appears to address water piping systems.Section 1108.2 is similar to the preparation of pipe ends found in other chapters. The same requirements would apply to refrigerant piping.

Section 1108.3 lists all of the acceptable joining methods. For brazing, there are requirements for using an inert gas inside the piping. This prevents oxidation on the interior of the piping. If there is excessive oxidation, it could result in obstruction of small piping or components in the system, as well as other system chemistry degradation, increasing the probability of future repair work. Reducing the frequency of opening refrigerating systems for repair reduces the exposure to numerous hazards and risks. For many of the joints, a reference to UL 207 is included. This standard covers the various refrigerant joining methods. The press-connect refrigerant fittings are listed to this standard, as are many mechanical joints.

Section 1108.3.4 includes all of the various threads that are used in refrigerant piping systems. This expands the listing of ASME standards for threaded joints.

Sections 1108.4 through 1108.9 list each material and the acceptable joining methods for the particular material.

The piping installation requirements are listed in a separate section from the material and joints and connections. The piping requirements have been expanded to address the necessary safety measures to assure a proper piping installation.

With a greater use of VRV and VRF systems, there is significantly more refrigerant piping installed inside a building. Additionally, with split systems and multi-split systems in multistory residential buildings, there is also a significant amount of piping installed.

There will be an expanded use of Group A2L refrigerants that are low global warming potential refrigerants. These refrigerants were previously listed as a subgroup of A2 refrigerants. As a separate group, the requirements need to be provided to address the installation of piping with Group A2L refrigerants.

The new section on piping is divided into four main subject matters. The first part of the section addresses piping requirements for all types of refrigerants being used. The second part is for Group A2L and B2L refrigerants. The third part is for piping requirements for Group A2, A3, B2, and B3 refrigerants. The last part has additional general requirements for piping installations.

Section 1109.1 includes a reference to ASME B31.5. This standard is currently referenced in Section 1107.1. There is no change regarding the application of ASME B31.5.

Section 1109.2 identifies which sections are applicable to which refrigerant groups.

Section 1109.2.1 is a rewording of the requirements currently found in Section 1107.2.

Section 1109.2.2 is a new section requiring refrigerant piping to be concealed within the building elements. While this is implied in the current code, it is not stated. Section 1109.2.2.1, allowing refrigerant piping to be exposed, is similar to the current allowance specified in Sections 1107.2 and 1107.3. The other allowance would be refrigerant piping located in a machinery room. Exposed piping is anticipated in a machinery room where access is restricted to authorized personnel.

Section 1109.2.3 is similar to current Section 1107.2. One of the changes is the allowance for refrigerant piping to be located in the ceiling of a corridor, hence, not exposed. This appears to be implied, however, when the ceiling space is considered a part of the corridor, it appears to be prohibited. Refrigerant piping, especially for multi-split systems is often installed in the ceiling of a corridor. If the RCL requirements are met, there is no hazard posed to the corridor.

Section 1109.2.4 is a duplication of the requirements currently found in Section 1107.2.1.

Section 1109.2.5 is a new section regulating the requirements for shaft containing refrigerant piping. A fire-resistance-rated shaft will be required when the refrigerant piping connects three or more stories. Other utilities can also be located within the same shaft. There are three exceptions proposed to the shaft requirements in Section 1109.2.5.1, one is when water is use, that is R718 refrigerant. The second is for the use of Group A1 refrigerants provided the smallest space in which the pipe pass meets the RCL requirements for the refrigerant. The last exception is for when the piping is installed on the outside of the building where any leak would vent to atmosphere.

Section 1109.2.6 is also a new requirement. This section is intended to protect an individual from directly contacting a hot or cold refrigerant pipe. The temperatures are based on avoiding burning the skin or causing frostbite or frost damage to the skin. One of the methods of protection would adding insulation around the pipe. This is the most common method of protection for exposed piping.

Section 1109.3 is a new section regulating the installation of piping using Group A2L or B2L refrigerants. These refrigerants are lower flammable, lower burning velocity refrigerants. While the refrigerant will burn, it doesn't ignite or burn very easily. Since it is flammable additional protection requirements are proposed.

Section 1109.3.1 will require continuous protection when the piping is located within 1-1/2 inches of the nearest edge of a member. Currently the code requires this level of protection in certain locations, such as the top plate and bottom plate. This section will require the protection where ever the piping is installed. The protection is intended to prevent the tubing from be punctured by a nail or screw.

Section 1109.3.2 requires ventilation of the shaft in which the refrigerant piping is located. A minimal movement of air will exhaust the leaking refrigerant out of the shaft. The velocity rates identified in Table 1109.3.2 are taken from a peer reviewed paper published by ASME, and ensure that density differences between air and refrigerant will not defeat the purpose to exhaust the released refrigerant out of the shaft, whether in horizontal or vertical shaft orientation.

The ventilation would only be required when there is a leak of refrigerant. A leak detector is required in the shaft to identify when a leak occurs. Another option would be to naturally ventilate the shaft or continuously ventilate the shaft. Since most refrigerants are heavier than air, they tend to move downward. If naturally ventilated, the refrigerant moves to outside the building. An exception to the ventilation requirements would be the use of double wall pipe. While this is not commonly installed, the possibility exists that there will be greater use of double wall pipe.

The final requirement in Section 1109.3.3 specifies the labeling requirements for the piping. Since B2L refrigerant is toxic, there are special requirements to label the pipe as containing toxic refrigerant.

Section 1109.4 has the special requirement for the more flammable and more toxic refrigerants. Section 1109.4.1 requires the systems to be installed using only pipe, not tubing. The added strength of the pipe will reduce any potential leak from a puncture. The exception to this requirement would be self-contained listed equipment. Some refrigerators and similar appliances are using Group A3 refrigerants. However, these appliances are tested and listed.

Section 1109.4.2 requires any shaft with these refrigerants to be continuously ventilated. The same velocity requirements apply to this group of refrigerants as Group A2L and B2L. There is also an exception for double wall pipe.

Section 1109.4.3 specifies the labeling requirements. The labels are similar to what is required in UL/CSA 60335-2-40.

Section 1109.5 is a new section regulating pipe penetrations. Any time a pipe penetrated a wall, floor, or ceiling, it must be sealed to prevent the passage of any refrigerant that may be leaking. There is a direct reference to the building code for penetrations of fire-resistance-rated assemblies.

Section 1109.6 is a new requirement for pipe protection. Similar language has been used for other piping systems in the Mechanical Code and the Plumbing Code. The requirements are also applicable to refrigerant piping.

Sections 1109.7 through 1109.8.4 are rewording and relocation of current Sections 1107.4, 1107.8, 1107.8.1, 1107.8.2, and 1107.8.3.

The Refrigerant Piping Committee spent a considerable amount of time rewriting and discussing the testing requirements. The basis for Section 1110 is the current Section 1108. The key elements of Section 1108 are captured in the new section. The significant differences relate to the test medium, the test equipment, and the pressure and vacuum test.

The test gas is specified as being either oxygen-free nitrogen, helium, or argon. These are the three inert gases used for testing refrigerant piping systems. Carbon dioxide refrigerant systems are permitted to be tested with carbon dioxide. Water refrigerant piping systems are permitted to be tested with water.

For smaller systems, refrigerant contractors have used the refrigerant for testing. This would be permitted for systems having 5/8 inch or smaller tubing.

The accuracy of the test gage is not currently specified. Most test gages used by refrigerant contractors have an accuracy within 2-1/2 percent. The allowance for up to 3 percent takes into consideration other gages that may be used.

For the testing of the system, the Committee believes it is important to run two tests; one is a pressure test, the other is a vacuum test. When testing with internal pressures, a one-way leak in the reverse direction may not be discovered. However, when a vacuum is placed on the system, the leak will be identified. The standard test for refrigerant systems is one hour for pressure and 10 minutes for a vacuum. These tests have been added to the section.

Cost Impact: The code change proposal will increase the cost of construction
The additional testing required for refrigerant piping will take additional time which equates to a high cost for labor.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: This provides direction to the code officials to inspect for proper installations. Workers often braze without nitrogen purge, for example, and there is nothing to cite in current code. The code needs teeth to address bad practices. This adds safety provisions that are not in current code. The testing requirements are a worthy addition to the code. (Vote 6-5)

Assembly Action: **None**

Public Comments

Public Comment 1:

Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Daikin US (jbengineer@aol.com) requests As Modified by Public Comment

2018 International Mechanical Code

1109.2 Piping location. Refrigerant piping shall comply with the installation location requirements of Sections 1109.2.1 through ~~1109.2.6~~ 1109.2.7. Refrigerant piping for group A2L and B2L shall also comply with the requirements of Section 1109.3. Refrigerant piping for group A2, A3, B2 and B3 shall also comply with the requirements of Section 1109.4.

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 on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be ½ inch. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2, A3, B2, and B3 refrigerant 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."

~~**1109.3.3 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 on the refrigerant piping or pipe insulation. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group B2L refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The minimum height of lettering of the identification label shall be ½ inch.~~

~~**1109.4.3 Pipe identification.** Refrigerant pipe shall be identified with the refrigerant designation and safety group classification of refrigerant used in the piping system and the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For Group B2 and B3 refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The identification shall be at intervals not exceeding 5 feet on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be 1 inch.~~

Commenter's Reason: The identification requirements should have been placed in the general piping installation requirements rather than the subsections on A2L and B2L, and A2, A3, B2, and B3. The also assures that Group B1 refrigerants are properly identified.
The remainder of the proposed requirement are unchanged. Only these sections require further clarification.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is an editorial change moving the pipe identification requirements to the general piping section.

Final Action Results

M99-18	**AMPC1**

M8523/M101-18

Date Submitted 2/5/2021	**Section** 1103.2	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

Table 1104.3.2

Summary of Modification

Per proposal the occupancy type "Assembly" in Table 1104.3.2 is incomplete and should be "Public Assembly" to be consistent with occupancy types as defined in Section 1103.2.

Rationale

The occupancy type "Assembly" in Table 1104.3.2 is incomplete and should be "Public Assembly" to be consistent with occupancy types as defined in Section 1103.2.

Approved as Submitted

2018 International Mechanical Code

1103.2 Occupancy classification. Locations of refrigerating systems are described by occupancy classifications that consider the ability of people to respond to potential exposure to refrigerants. Where equipment or appliances, other than piping, are located outside a building and within 20 feet (6096 mm) of any building opening, such equipment or appliances shall be governed by the occupancy classification of the building. Occupancy classifications shall be defined as follows:

1. Institutional occupancy is that portion of premises from which occupants cannot readily leave without the assistance of others because they are disabled, debilitated or confined. Institutional occupancies include, among others, hospitals, nursing homes, asylums and spaces containing locked cells.

2. Public assembly occupancy is that portion of premises where large numbers of people congregate and from which occupants cannot quickly vacate the space. Public assembly occupancies include, among others, auditoriums, ballrooms, classrooms, passenger depots, restaurants and theaters.

3. Residential occupancy is that portion of premises that provides the occupants with complete independent living facilities, including permanent provisions for living, sleeping, eating, cooking and sanitation. Residential occupancies include, among others, dormitories, hotels, multiunit apartments and private residences.

4. Commercial occupancy is that portion of premises where people transact business, receive personal service or purchase food and other goods. Commercial occupancies include, among others, office and professional buildings, markets (but not large mercantile occupancies) and work or storage areas that do not qualify as industrial occupancies.

5. Large mercantile occupancy is that portion of premises where more than 100 persons congregate on levels above or below street level to purchase personal merchandise.

6. Industrial occupancy is that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to manufacture, process or store goods such as chemicals, food, ice, meat or petroleum.

7. Mixed occupancy occurs where two or more occupancies are located within the same building. Where each occupancy is isolated from the rest of the building by tight walls, floors and ceilings and by self-closing doors, the requirements for each occupancy shall apply to its portion of the building. Where the various occupancies are not so isolated, the occupancy having the most stringent requirements shall be the governing occupancy.

Revise as follows:

TABLE 1104.3.2
MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS

TYPE OF REFRIGERATION SYSTEM	**MAXIMUM POUNDS FOR VARIOUS OCCUPANCIES**			
	Institutional	**Public Assembly**	Residential	All other occupancies
Sealed absorption system				
In exit access	0	0	3.3	3.3
In adjacent outdoor locations	0	0	22	22
In other than exit access	0	6.6	6.6	6.6
Unit systems				
In other than exit access	0	0	6.6	6.6

For SI: 1 pound = 0.454 kg.

Code Change No: M101-18

Original Proposal

Section(s): 1103.2, TABLE 1104.3.2

Proponents: Phillip Johnson, representing self (phillip.johnson@daikinapplied.com)

2018 International Mechanical Code

1103.2 Occupancy classification. Locations of refrigerating systems are described by occupancy classifications that consider the ability of people to respond to potential exposure to refrigerants. Where equipment or appliances, other than piping, are located outside a building and within 20 feet (6096 mm) of any building opening, such equipment or appliances shall be governed by the occupancy classification of the building. Occupancy classifications shall be defined as follows:

1. Institutional occupancy is that portion of premises from which occupants cannot readily leave without the assistance of others because they are disabled, debilitated or confined. Institutional occupancies include, among others, hospitals, nursing homes, asylums and spaces containing locked cells.
2. Public assembly occupancy is that portion of premises where large numbers of people congregate and from which occupants cannot quickly vacate the space. Public assembly occupancies include, among others, auditoriums, ballrooms, classrooms, passenger depots, restaurants and theaters.
3. Residential occupancy is that portion of premises that provides the occupants with complete independent living facilities, including permanent provisions for living, sleeping, eating, cooking and sanitation. Residential occupancies include, among others, dormitories, hotels, multiunit apartments and private residences.
4. Commercial occupancy is that portion of premises where people transact business, receive personal service or purchase food and other goods. Commercial occupancies include, among others, office and professional buildings, markets (but not large mercantile occupancies) and work or storage areas that do not qualify as industrial occupancies.
5. Large mercantile occupancy is that portion of premises where more than 100 persons congregate on levels above or below street level to purchase personal merchandise.
6. Industrial occupancy is that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to manufacture, process or store goods such as chemicals, food, ice, meat or petroleum.
7. Mixed occupancy occurs where two or more occupancies are located within the same building. Where each occupancy is isolated from the rest of the building by tight walls, floors and ceilings and by self-closing doors, the requirements for each occupancy shall apply to its portion of the building. Where the various occupancies are not so isolated, the occupancy having the most stringent requirements shall be the governing occupancy.

Revise as follows:

TABLE 1104.3.2
MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS

TYPE OF REFRIGERATION SYSTEM	**MAXIMUM POUNDS FOR VARIOUS OCCUPANCIES**			
	Institutional	**Public Assembly**	Residential	All other occupancies
Sealed absorption system				
In exit access	0	0	3.3	3.3
In adjacent outdoor locations	0	0	22	22
In other than exit access	0	6.6	6.6	6.6
Unit systems				
In other than exit access	0	0	6.6	6.6

For SI: 1 pound = 0.454 kg.

Reason: The occupancy type "Assembly" in Table 1104.3.2 is incomplete and should be "Public Assembly" to be consistent with occupancy types as defined in Section 1103.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
Editorial change only, no technical change so no cost impact.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M101-18 **AS**

M9126/E15-18 Part II

Date Submitted 2/18/2021	**Section** 1105.10	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

1105.10 [BE] (New)

Summary of Modification

The need for rapid escape from refrigeration machinery rooms is not unlike what is needed for Group H Occupancies, which are required by Section 1010.1.10 to have panic hardware on all swinging doors

Rationale

It is appropriate for refrigeration machinery rooms to have panic hardware on means of egress doors to protect occupants because of the risk of a rapid release of hazardous or asphyxiant gases. The need for rapid escape from refrigeration machinery rooms is not unlike what is needed for Group H Occupancies, which are required by Section 1010.1.10 to have panic hardware on all swinging doors. Likewise, IIAR 2 includes this requirement for ammonia refrigeration machinery rooms.

It is also recommended that this section be duplicated in the IMC to ensure that the requirements are not overlooked by machinery room designers. The requirement in the IBC is not readily found as a refrigeration machinery room requirement since it is isolated in the means of egress chapter.

Approved as Submitted

2018 International Mechanical Code

Add new text as follows:

1105.10 [BE] Means of egress. Machinery rooms larger than 1,000 square feet (93 m2) shall have not less than two exits or exit access doorways. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room.

-

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access doorway. An increase in exit access travel distance is permitted in accordance with Section 1017.1.

-

Exit and exit access doorways shall swing in the direction of egress travel and shall be equipped with panic hardware, regardless of the occupant load served. Exit and exit access doorways shall be tight fitting and self-closing.

Code Change No: E15-18 Part II

Original Proposal

Section(s): 1105.10 [BE] (New)

Proponent: Jeffrey Shapiro, representing International Institute of Ammonia Refrigeration (jeff.shapiro@intlcodeconsultants.com)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER OF THESE COMMITTEES.2018 International Building Code

2018 International Mechanical Code

Add new text as follows:

1105.10 [BE] Means of egress. Machinery rooms larger than 1,000 square feet (93 m2) shall have not less than two exits or exit access doorways. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access doorway. An increase in exit access travel distance is permitted in accordance with Section 1017.1.

Exit and exit access doorways shall swing in the direction of egress travel and shall be equipped with panic hardware, regardless of the occupant load served. Exit and exit access doorways shall be tight fitting and self-closing.

Reason: It is appropriate for refrigeration machinery rooms to have panic hardware on means of egress doors to protect occupants because of the risk of a rapid release of hazardous or asphyxiant gases. The need for rapid escape from refrigeration machinery rooms is not unlike what is needed for Group H Occupancies, which are required by Section 1010.1.10 to have panic hardware on all swinging doors. Likewise, IIAR 2 includes this requirement for ammonia refrigeration machinery rooms.

It is also recommended that this section be duplicated in the IMC to ensure that the requirements are not overlooked by machinery room designers. The requirement in the IBC is not readily found as a refrigeration machinery room requirement since it is isolated in the means of egress chapter.

Cost Impact: The code change proposal will increase the cost of construction
For machinery rooms that would not already have been provided with panic hardware on means of egress doors, the requirement to have panic hardware will constitute an increased cost.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

E15-18 Part II	**AS**

M9779/F83-18 Part I

Date Submitted 3/19/2021	**Section** 1106.5.1	**Proponent** Mo Madani
Chapter 11	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

IFC: 605.17.1;
IMC: [F] 1106.5.1)

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

Editorial clarification. The current exception format of IFC Section 605.17 gives this section the appearance of being a circular requirement with Section 605.16 (IMC section are similarly structured).

Rationale

Editorial clarification. The current exception format of IFC Section 605.17 gives this section the appearance of being a circular requirement with Section 605.16 (IMC section are similarly structured). No technical change is intended by this proposal. The revision to Section 605.17.1 is for correlation with Section 605.16 Exception 2, which references Section 605.17 as a "ventilation" requirement only. Leak detection is already required, and the purpose of 605.17.1 is to specify activation of ventilation by the detection system, not to create another requirement to have a detection system. IMC changes are proposed to make the sections consistent. For disclosure, I represent IIAR, which has an interest in the refrigeration industry, but this proposal is not being submitted on IIAR's behalf. I am submitting the proposal based on my personal interest and expertise in the refrigeration industry and my interest in clarity of refrigeration related requirements as a consultant to the ASHRAE 15 Committee.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

~~[F]~~ 1106.5.1 ~~Refrigerant detection system.~~ Ventilation system activation. ~~The machinery room~~ Ventilation shall be ~~provided with a refrigerant detection system. The refrigerant detection system~~ activated by the refrigerant detection system in the machinery room. Refrigerant detection 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% of the LFL.
2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.5.2.
3. The detection, signaling and control circuits shall be supervised.

Code Change No: F83-18 Part I

Original Proposal

Section(s): **IFC: 605.17.1;**
IMC: [F] 1106.5.1)

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD THE IFC COMMITTEE, PART II WILL BE HEARD BY THE IMC COMMITTEE. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THE RESPECTIVE COMMITTEES.

2018 International Fire Code

Revise as follows:

605.17.1 ~~**Refrigerant detection system.**~~ **Ventilation system activation.** ~~The machinery room~~ Ventilation shall be ~~provided with a refrigerant detection system. The refrigerant detection system~~ activated by the refrigerant detection system in the machinery room. Refrigerant detection shall be in accordance with Section 605.8 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 in Section 605.17.3.
3. The detection, signaling and control circuits shall be supervised.

2018 International Mechanical Code

Revise as follows:

~~**[F]**~~ **1106.5.1** ~~**Refrigerant detection system.**~~ **Ventilation system activation.** ~~The machinery room~~ Ventilation shall be ~~provided with a refrigerant detection system. The refrigerant detection system~~ activated by the refrigerant detection system in the machinery room. Refrigerant detection 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% of the LFL.
2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.5.2.
3. The detection, signaling and control circuits shall be supervised.

Reason: Editorial clarification. The current exception format of IFC Section 605.17 gives this section the appearance of being a circular requirement with Section 605.16 (IMC section are similarly structured). No technical change is intended by this proposal. The revision to Section 605.17.1 is for correlation with Section 605.16 Exception 2, which references Section 605.17 as a "ventilation" requirement only. Leak detection is already required, and the purpose of 605.17.1 is to specify activation of ventilation by the detection system, not to create another requirement to have a detection system. IMC changes are proposed to make the sections consistent. For disclosure, I represent IIAR, which has an interest in the refrigeration industry, but this proposal is not being submitted on IIAR's behalf. I am submitting the proposal based on my personal interest and expertise in the refrigeration industry and my interest in clarity of refrigeration related requirements as a consultant to the ASHRAE 15 Committee.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial clarification.

Report of Committee Action
Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved based upon the proponents reason statement. In addition this proposal also clarifies the ventilation systems is required to be activated. (Vote: 14-0)

Assembly Action: **None**

Final Action

F83-18 Part I	**AS**

M9780/F83-18 Part II

Date Submitted	3/19/2021	**Section**	1106.4	**Proponent**	Mo Madani
Chapter	11	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Denied – Consent			**Staff Classification**	Overlap
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

IMC: 1106.4, 1106.5;
IFC: [M]605.17

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

Editorial clarification. The current exception format of IFC Section 605.17 gives this section the appearance of being a circular requirement with Section 605.16 (IMC section are similarly structured).

Rationale

Editorial clarification. The current exception format of IFC Section 605.17 gives this section the appearance of being a circular requirement with Section 605.16 (IMC section are similarly structured). No technical change is intended by this proposal. The revision to Section 605.17.1 is for correlation with Section 605.16 Exception 2, which references Section 605.17 as a "ventilation" requirement only. Leak detection is already required, and the purpose of 605.17.1 is to specify activation of ventilation by the detection system, not to create another requirement to have a detection system. IMC changes are proposed to make the sections consistent. For disclosure, I represent IIAR, which has an interest in the refrigeration industry, but this proposal is not being submitted on IIAR's behalf. I am submitting the proposal based on my personal interest and expertise in the refrigeration industry and my interest in clarity of refrigeration related requirements as a consultant to the ASHRAE 15 Committee.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1106.4 Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.

Exceptions:

1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3.
2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 1106.5.

1106.5 Special requirements for Group A2L refrigerant machinery rooms. Machinery rooms ~~for~~ with systems containing Group A2L refrigerants ~~shall comply with Sections 1106.5.1 through 1106.5.3.~~

–

~~Exception:~~ ~~Machinery rooms conforming to the~~ that do not conform with the Class I, Division 2~~,~~ hazardous location ~~classification~~ electrical requirements of NFPA 70 ~~are not required to~~, as permitted by Section 1106.4 Exception 2, shall comply with Sections 1106.5.1 ~~and 1106.5.2.~~ through 1106.5.3.

Code Change No: F83-18 Part II

Original Proposal

Section(s): **IMC: 1106.4, 1106.5;**
IFC: [M]605.17

Proponents: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD THE IFC COMMITTEE, PART II WILL BE HEARD BY THE IMC COMMITTEE. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THE RESPECTIVE COMMITTEES.

2018 International Mechanical Code

Revise as follows:

1106.4 Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.

Exceptions:

1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3.
2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 1106.5.

1106.5 Special requirements for Group A2L refrigerant machinery rooms. Machinery rooms ~~for~~ with systems containing Group A2L refrigerants ~~shall comply with Sections 1106.5.1 through 1106.5.3.~~

~~**Exception**:~~ ~~Machinery rooms conforming to the~~ that do not conform with the Class I, Division 2~~,~~ hazardous location ~~classification~~ electrical requirements of NFPA 70 ~~are not required to~~, as permitted by Section 1106.4 Exception 2, shall comply with Sections 1106.5.1 ~~and 1106.5.2.~~ through 1106.5.3.

2018 International Fire Code

Revise as follows:

[M] 605.17 Special requirements for Group A2L refrigerant machinery rooms. Machinery rooms with systems containing Group A2L refrigerants ~~shall comply with Sections 605.17.1 through 605.17.3.~~

~~**Exception:**~~ ~~Machinery rooms conforming to the Class 1~~ that do not conform with the Class I, Division 2 hazardous location ~~classification~~ electrical requirements of NFPA 70, as permitted by Section 605.16 Exception 2, shall comply with Sections 605.17.1 through 605.17.3.

Reason: Editorial clarification. The current exception format of IFC Section 605.17 gives this section the appearance of being a circular requirement with Section 605.16 (IMC section are similarly structured). No technical change is intended by this proposal. The revision to Section 605.17.1 is for correlation with Section 605.16 Exception 2, which references Section 605.17 as a "ventilation" requirement only. Leak detection is already required, and the purpose of 605.17.1 is to specify activation of ventilation by the detection system, not to create another requirement to have a detection system. IMC changes are proposed to make the sections consistent. For disclosure, I represent IIAR, which has an interest in the refrigeration industry, but this proposal is not being submitted on IIAR's behalf. I am submitting the proposal based on my personal interest and expertise in the refrigeration industry and my interest in clarity of refrigeration related requirements as a consultant to the ASHRAE 15 Committee.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Editorial clarification.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Action

F83-18 Part II	**AS**

M8529/M107-18

Date Submitted 2/5/2021	**Section** 1203.14.3	**Proponent** Mo Madani
Chapter 12	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

This section does not exist in the 2020 FBC-M.

Summary of Modification

Modifications to text for Section 1203.14.3 "Push-fit fittings", stating fittings shall comply with ASSE 1061 and be used with PE-RT tubing rated for use by the manufacturer.

Rationale

The language in the 2018 edition was not accepted by the 2018 Code Committee because 1) there was no technical evidence presented that there is an issue using certain fittings with EVOH tubing, and 2) stating how a product should not be used is improper code language. Even though the public comment submitted had no technical evidence to support the change, this myth was perpetuated at the Public Comment hearing and won a narrow and poorly attended floor vote. While it should not influence this specific Committee, it should be noted that this language is not in the 2018 IPC, IRC, or any other code in this country where PE-RT tubing applications are listed.

Due to the vast number of joining technologies, the issue of fitting use is addressed in the ASTM standards for PE-RT tubing. These standards require the tubing manufacturer to clearly mark the standard designation of the fitting system(s) for which the tubing is recommended for use. The proposed language will make the installer and code official cognizant of the installation requirements without having to add language of what not to do.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1203.14.3 Push-fit ~~joints~~ fittings. Push-fit ~~joints that create a seal on the outside diameter of the tubing shall not be used with tubing that has an ethylene vinyl alcohol copolymer (EVOH) oxygen barrier layer~~ fittings shall comply with ASSE 1061 and be used with PE-RT tubing that is rated for use with such fittings by the tubing manufacturer.

Code Change No: M107-18

Original Proposal

Section(s): 1203.14.3

Proponents: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Mechanical Code

Revise as follows:

1203.14.3 Push-fit ~~joints~~ fittings. Push-fit ~~joints that create a seal on the outside diameter of the tubing shall not be used with tubing that has an ethylene vinyl alcohol copolymer (EVOH) oxygen barrier layer~~ fittings shall comply with ASSE 1061 and be used with PE-RT tubing that is rated for use with such fittings by the tubing manufacturer.

Reason: The language in the 2018 edition was not accepted by the 2018 Code Committee because 1) there was no technical evidence presented that there is an issue using certain fittings with EVOH tubing, and 2) stating how a product should not be used is improper code language. Even though the public comment submitted had no technical evidence to support the change, this myth was perpetuated at the Public Comment hearing and won a narrow and poorly attended floor vote. While it should not influence this specific Committee, it should be noted that this language is not in the 2018 IPC, IRC, or any other code in this country where PE-RT tubing applications are listed.

Due to the vast number of joining technologies, the issue of fitting use is addressed in the ASTM standards for PE-RT tubing. These standards require the tubing manufacturer to clearly mark the standard designation of the fitting system(s) for which the tubing is recommended for use. The proposed language will make the installer and code official cognizant of the installation requirements without having to add language of what not to do.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal brings the code back to the proper installation language.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 7-4)

Assembly Action: **None**

Final Hearing Results

M107-18 **AS**

M8532/M108-18

Date Submitted 2/5/2021	**Section** 1203.9.3	**Proponent** Mo Madani
Chapter 12	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

This section does not exist in the 2020 FBC-M

Summary of Modification

Modifies text of Section 1203.9.3 "Push-fit fittings", stating that fittings shall comply with ASSE 1061, and that PEX tubing is rated by the manufacturer.

Rationale

The language in the 2018 edition was not accepted by the 2018 Code Committee because 1) there was no technical evidence presented that there is an issue using certain fittings with EVOH PEX tubing, 2) there is a long history of these fittings in use with all PEX tubing, and 3) stating how a product should not be used is improper code language. Even though the public comment submitted had no technical evidence to support the change, this myth was perpetuated at the Public Comment hearing and won a narrow and poorly attended floor vote. While it should not influence this specific Committee, it should be noted that this language is not in the 2018 IPC, IRC, or any other code in this country where PEX tubing applications are listed.
Due to the vast number of joining technologies and PEX manufacturing methods, the issue of fitting use is addressed in the ASTM F876 standard for PEX tubing. ASTM F876 requires the tubing manufacturer to clearly mark the standard designation of the fitting system(s) for which the tubing is recommended for use. The proposed language will make the installer and code official cognizant of the installation requirements without having to add language of what not to do.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1203.9.3 Push-fit ~~joints~~ fittings. Push-fit ~~joints that create a seal on the outside diameter of the tubing shall not~~ fittings shall comply with ASSE 1061 and be used with ~~tubing that has an ethylene vinyl alcohol copolymer (EVOH) oxygen barrier layer~~PEX tubing that is rated for use with such fittings by the tubing manufacturer.

Code Change No: M108-18

Original Proposal

Section(s): 1203.9.3

Proponents: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Mechanical Code

Revise as follows:

1203.9.3 Push-fit ~~joints~~ fittings. Push-fit ~~joints that create a seal on the outside diameter of the tubing shall not~~ fittings shall comply with ASSE 1061 and be used with ~~tubing that has an ethylene vinyl alcohol copolymer (EVOH) oxygen barrier layer~~ PEX tubing that is rated for use with such fittings by the tubing manufacturer.

Reason: The language in the 2018 edition was not accepted by the 2018 Code Committee because 1) there was no technical evidence presented that there is an issue using certain fittings with EVOH PEX tubing, 2) there is a long history of these fittings in use with all PEX tubing, and 3) stating how a product should not be used is improper code language. Even though the public comment submitted had no technical evidence to support the change, this myth was perpetuated at the Public Comment hearing and won a narrow and poorly attended floor vote. While it should not influence this specific Committee, it should be noted that this language is not in the 2018 IPC, IRC, or any other code in this country where PEX tubing applications are listed.

Due to the vast number of joining technologies and PEX manufacturing methods, the issue of fitting use is addressed in the ASTM F876 standard for PEX tubing. ASTM F876 requires the tubing manufacturer to clearly mark the standard designation of the fitting system(s) for which the tubing is recommended for use. The proposed language will make the installer and code official cognizant of the installation requirements without having to add language of what not to do.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
This proposal returns this code to previous language.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval is consistent with the committee recommendation for M107-18. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M108-18	**AS**

M8535/M110-18

Date Submitted	2/5/2021	**Section**	1209.5	**Proponent**	Mo Madani
Chapter	12	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Denied – Consent			**Staff Classification**	Overlap
Commission Action	Pending Review				

Comments

General Comments **No**

Related Modifications

1209.5.1, 1209.5.2

Original text of s. 1209.5 is not consistent with that of the 2020 FBC-M.

Summary of Modification

This proposal is an editorial change that removes the term "thermal barrier" and replaces it with "thermal break" in Section 1209.5.

Rationale

This proposal is an editorial change that removes the term "thermal barrier" and replaces it with "thermal break" in Section 1209.5 of the IMC for radiant floor heating systems. The term "thermal barrier" refers to fire performance requirements; this section is focusing only on the requirement to insulate the floor system. "Thermal barrier" should be used only to describe the protection of a combustible materials from direct exposure to fire.

Approved as Submitted

2018 International Mechanical Code

Revise as follows:

1209.5 ~~Thermal barrier~~ Insulation and thermal break required. Radiant floor heating systems shall be provided with insulation and a thermal ~~barrier~~ break in accordance with Sections 1209.5.1 and 1209.5.2. Insulation R-values for slab-on-grade and suspended floor installation shall be in accordance with the International Energy Conservation Code.

> **Exception:** Insulation shall not be required in engineered systems where it can be demonstrated that the insulation will decrease the efficiency or have a negative effect on the installation.

1209.5.1 Thermal break required. A thermal break shall be provided consisting of asphalt expansion joint materials or similar insulating materials at a point where a heated slab meets a foundation wall or other conductive slab.

Revise as follows:

1209.5.2 ~~Thermal barrier~~ Insulation material marking. Insulating materials utilized in ~~thermal barriers~~ radiant floor heating systems shall be installed such that the manufacturer's R-value mark is readily observable upon inspection.

Code Change No: M110-18

Original Proposal

Section(s): 1209.5, 1209.5.1, 1209.5.2

Proponents: Mike Fischer, Kellen Company, representing The Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Mechanical Code

Revise as follows:

1209.5 ~~Thermal barrier~~ Insulation and thermal break required. Radiant floor heating systems shall be provided with insulation and a thermal ~~barrier~~ break in accordance with Sections 1209.5.1 and 1209.5.2. Insulation R-values for slab-on-grade and suspended floor installation shall be in accordance with the International Energy Conservation Code.

> **Exception:** Insulation shall not be required in engineered systems where it can be demonstrated that the insulation will decrease the efficiency or have a negative effect on the installation.

1209.5.1 Thermal break required. A thermal break shall be provided consisting of asphalt expansion joint materials or similar insulating materials at a point where a heated slab meets a foundation wall or other conductive slab.

Revise as follows:

1209.5.2 ~~Thermal barrier~~ Insulation material marking. Insulating materials utilized in ~~thermal barriers~~ radiant floor heating systems shall be installed such that the manufacturer's R-value mark is readily observable upon inspection.

Reason: This proposal is an editorial change that removes the term "thermal barrier" and replaces it with "thermal break" in Section 1209.5 of the IMC for radiant floor heating systems. The term "thermal barrier" refers to fire performance requirements; this section is focusing only on the requirement to insulate the floor system. "Thermal barrier" should be used only to describe the protection of a combustible materials from direct exposure to fire.
Cost Impact: The code change proposal will not increase or decrease the cost of construction.
The proposal is editorial in nature.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M110-18	**AS**

M8546/M120-18

Date Submitted 2/5/2021 **Chapter** 13	**Section** 1302.3 **Affects HVHZ** Yes	**Proponent** Mo Madani **Attachments** Yes
TAC Recommendation Denied – Consent **Commission Action** Pending Review		**Staff Classification** Overlap

Comments

General Comments **No**

Related Modifications

Table 1302.3, 1302.9, Reference Standards

Original text of this code change is not consistent with that of the 2020 FBC-M.

Summary of Modification

Modified text of Table 1302.3 "Fuel Oil Piping", removing stainless steel tubing. Modifies text of Section 1302.9. Adds new standard.

Rationale

The corrugated stainless steel tubing double-containment system, including termination fittings, is intended for use with fuel oil, as well as motor vehicle, aviation and marine fuels either above or below grade. The intent and design of double containment systems are focused on preventing fuel oil leaks that could result in severe fire hazards.

The corrugated stainless steel primary tubing is a zero-permeation pipe which is highly resistant to corrosion with exceptional crush resistance. The UV stabilized Nylon 12 protective containment layer offers exceptional resistance to hydrocarbons, chemical and water exposure, and carries a 50 psig rating. An EFEP secondary barrier jacket layer is bonded to the Nylon 12 protective layer to offer secondary containment with exceptional permeation resistance for product compatibility. The interstitial space between the tubing and jacket allows continuous monitoring for leak detection, with a 50 psig rating for pressurized systems. The self-flaring fitting provides a metal to metal sealing surface with excellent reliability and is field-attachable using standard hand tools. This class of piping product has been used for a variety of fuels for several years without failure, and is also permitted in the IFGC for similar applications for fuel gas systems (see Section 404.14).

Approved as Modified

Original Proposal:

2018 International Mechanical Code

Revise as follows:

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280; ASME B16.51
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254; ASTM A539
~~Stainless steel tubing~~	~~ASTM A240; UL1369; UL971A~~

Add new text as follows:

1302.9 ~~Corrugated stainless steel tubing containment~~ Piping systems. ~~Corrugated stainless steel tubing that is factory-installed within a non-metallic containment.~~ Aboveground pipe systems shall be listed and labeled in accordance with UL 1369. Underground pipe systems shall be listed and labeled in accordance with ~~or~~ UL 971A.

Add new standard(s) as follows:

ASTM

A240/A240M- 15a: Standard Specification for Chromium and Chromium-nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications

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Modified Proposal:

1302.9 ~~Corrugated stainless steel tubing containment~~ Piping systems. ~~Corrugated stainless steel tubing that is factory-installed within a non-metallic containment~~ Aboveground pipe systems shall be listed and labeled in accordance with UL 1369. Underground pipe systems shall be listed and labeled in accordance with ~~or~~ UL 971A.

TABLE 1302.3

FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280; ASME B16.51
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254; ASTM A539
~~Stainless steel tubing~~	~~ASTM A240; UL1369; UL971A~~

Code Change No: M120-18

Original Proposal

Section(s):TABLE 1302.3, 1302.9 (New), Chapter 15

Proponents: Bob Torbin, OmegaFlex, representing OmegaFlex (bob.torbin@omegaflex.net)

2018 International Mechanical Code

Revise as follows:

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280; ASME B16.51
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254; ASTM A539
~~Stainless steel tubing~~	~~ASTM A240; UL1369; UL971A~~

Add new text as follows:

1302.9 ~~**Corrugated stainless steel tubing containment**~~ **Piping systems.** ~~Corrugated stainless steel tubing that is factory-installed within a non-metallic containment.~~ Aboveground pipe systems shall be listed and labeled in accordance with UL 1369. Underground pipe systems shall be listed and labeled in accordance with ~~or~~ UL 971A.

Add new standard(s) as follows:

ASTM
A240/A240M- 15a: Standard Specification for Chromium and Chromium-nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications

Reason: The corrugated stainless steel tubing double-containment system, including termination fittings, is intended for use with fuel oil, as well as motor vehicle, aviation and marine fuels either above or below grade. The intent and design of double containment systems are focused on preventing fuel oil leaks that could result in severe fire hazards.

The corrugated stainless steel primary tubing is a zero-permeation pipe which is highly resistant to corrosion with exceptional crush resistance. The UV stabilized Nylon 12 protective containment layer offers exceptional resistance to hydrocarbons, chemical and water exposure, and carries a 50 psig rating. An EFEP secondary barrier jacket layer is bonded to the Nylon 12 protective layer to offer secondary containment with exceptional permeation resistance for product compatibility. The interstitial space between the tubing and jacket allows continuous monitoring for leak detection, with a 50 psig rating for pressurized systems. The self-flaring fitting provides a metal to metal sealing surface with excellent reliability and is field-attachable using standard hand tools. This class of piping product has been used for a variety of fuels for several years without failure, and is also permitted in the IFGC for similar applications for fuel gas systems (see Section 404.14).

Cost Impact: The code change proposal will decrease the cost of construction
The use of a listed encasement system results in cost savings because the piping and encasement are installed simultaneously. This avoids the labor cost of separately installing the conduit and piping. In addition, the sealing and venting methods (when required) are also integrated within the encasement system, thus eliminating the need to separately assemble and/or install sealing and venting components within standard conduit.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

1302.9 ~~Corrugated stainless steel tubing containment~~ Piping systems. ~~Corrugated stainless steel tubing that is factory-installed within a non-metallic containment~~ Aboveground pipe systems shall be listed and labeled in accordance with UL 1369. Underground pipe systems shall be listed and labeled in accordance with ~~or~~ UL 971A.

TABLE 1302.3
FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
Copper or copper-alloy pipe	ASTM B42; ASTM B43; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280; ASME B16.51
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254; ASTM A539
~~Stainless steel tubing~~	~~ASTM A240; UL1369; UL971A~~

Committee Reason: Approval was based on the proponent's published reason statement. The modification corrects the problems that were inconsistent with the code currently. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M120-18 **AM**

M9332/RM22-18

88

Date Submitted 2/24/2021
Chapter 2
Section 202
Affects HVHZ Yes
Proponent Mo Madani
Attachments Yes
TAC Recommendation Denied – Consent
Commission Action Pending Review
Staff Classification Correlates Directly

Comments

General Comments **Yes**

Related Modifications

1505.4.3

This code change is already part of the 2020 FBC-R.

Summary of Modification

This code change credits the better performance of whole-building dilution ventilation systems that are distributed, mixed and balanced.

Rationale

Please see attachment

Comment Period History

M9332-G1

Proponent Alan Gremillion **Submitted** 6/24/2021 **Attachments** No

Comment:

Unable to determine cost impact, but if this change reduces the volume of air that is required to be brought into the home, then this could potentially lower construction and operating costs.

Comment Period History

M9332-G2

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change because the FBC-R 7th Edition (2020) already has the provisions.

Approved as modified by public comment 1 (AMPC1)

Orginal MOD

Add new definition(s):

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10% of the total mechanical supply airflow rate.

Revise as follows:

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house + [7.5 × (number of bedrooms + 1)] **(Equation 15-1)**

~~Exception~~ **Exceptions:**

1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).

2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by 25%, provided that all of the following conditions apply:

   2.1. A ducted system supplies recirculated air directly to each bedroom and the largest common area.

   2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four hour period.

   2.3. The whole-house ventilation system is a balanced ventilation system.

-

Public Comment 1:

IRC: (New), M1505.4.3

Craig Conner, representing Self (craig.conner@mac.com); Joseph Lstiburek, representing self (joe@buildingscience.com) requests As Modified by Public Comment

Further modify as follows:

2018 International Residential Code

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate ~~and~~ is within 10% of the total mechanical supply airflow rate ~~are substantially the same~~.

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

Ventilation rate in cubic feet per minute =0.01 ~~×~~ total square foot area of house + ~~7.5×number~~ 7.5 number of bedrooms + 1
(Equation 15-1)

Exceptions:

1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).

2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by ~~25%~~ 30%, provided that ~~all~~ both of the following conditions apply:

   2.1. A ducted system supplies ~~recirculated~~ ventilation air directly to each bedroom and ~~the largest common area.~~
   ~~2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four hour period.~~to one or more of the following rooms:
   2.1.1. Living room
   2.1.2. Dinning room
   2.1.3. Kitchen
   2.2.~~2.3~~ The whole-house ventilation system is a balanced ventilation system.

Code Change No: RM22-18

Original Proposal

Section(s): 202, M1505.4.3

Proponents: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Self (joe@buildingscience.com)

2018 International Residential Code

Add new definition(s):

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10% of the total mechanical supply airflow rate.

Revise as follows:

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house + [7.5 × (number of bedrooms + 1)] **(Equation 15-1)**

~~Exception~~ Exceptions:

1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).
2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by 25%, provided that all of the following conditions apply:
   - 2.1. A ducted system supplies recirculated air directly to each bedroom and the largest common area.
   - 2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four hour period.
   - 2.3. The whole-house ventilation system is a balanced ventilation system.

Reason: This code change credits the better performance of whole-building dilution ventilation systems that are distributed, mixed and balanced.

Distributed, mixed and balanced ventilation is more effective at controlling indoor contaminants than typical exhaust ventilation that provides no distribution and mixing. Ventilation with effective distribution and mixing prevents or minimizes high levels of contaminant concentration in various spaces within houses, especially rooms where people spend a lot of time with doors closed such as bedrooms. Distribution and mixing homogenizes interior conditions reducing potentially harmful high intermittent contaminant concentrations in interior spaces. Complex field testing and contaminate transport software analysis have shown that 70% mixing combined with a 25% reduced balanced ventilation is equally as effective as a typical exhaust ventilation.

This code change does not penalize exhaust ventilation, it justifiably credits balanced ventilation. Exhaust only ventilation should not be given the same indoor air quality credit in energy rating calculations since typical exhaust ventilation systems result in less air change than balanced ventilation systems and do not provide as effective control of contaminants. This code change rectifies that inequity.

Technical justification for this proposed code change can be found in the following links:

https://buildingscience.com/sites/default/files/migrate/pdf/CP-0909_ASHRAE_Calibrated_Multizone_Airflow.pdf
https://buildingscience.com/sites/default/files/migrate/pdf/CP-0908_ASHRAE_Modifying_Ventilation_Airflow.pdf
https://buildingscience.com/sites/default/files/migrate/pdf/CP-0802_Field_Test_Room_to_Room.pdf
http://www.nrcan.gc.ca/energy/efficiency/housing/home-improvements/18633
https://www.nrc-cnrc.gc.ca/ctu-sc/files/doc/ctu-sc/ctu-n15_eng.pdf

Cost Impact: The code change proposal will decrease the cost of construction
Choosing to use a more effective type of ventilation will result in a lower ventilation rate which could reduce both construction and operating costs.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The words "substantially the same" in the definition are subjective. The number of modifications offered indicate the need to revise this proposal in a public comment. (Vote 10-0)

Assembly Action: **None**

Public Comments

Public Comment 1:

IRC: (New), M1505.4.3

Craig Conner, representing Self (craig.conner@mac.com); Joseph Lstiburek, representing self (joe@buildingscience.com) requests As Modified by Public Comment

Further modify as follows:

2018 International Residential Code

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate ~~and~~ is within 10% of the total mechanical supply airflow rate ~~are substantially the same~~.

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

Ventilation rate in cubic feet per minute =0.01 ~~×~~ total square foot area of house + ~~7.5×number~~ 7.5 number of bedrooms + 1
(Equation 15-1)

Exceptions:

1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).
2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by ~~25%~~ 30%, provided that ~~all~~ both of the following conditions apply:
   - 2.1. A ducted system supplies ~~recirculated~~ ventilation air directly to each bedroom and ~~the largest common area.~~
   - ~~2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four hour period.~~ to one or more of the following rooms:
     - 2.1.1. Living room
     - 2.1.2. Dinning room
     - 2.1.3. Kitchen
   - 2.2 ~~2.3~~ The whole-house ventilation system is a balanced ventilation system.

Commenter's Reason: The words "substantially the same" are made less subjective by describing them as "within 10%" as requested by the committee.

The new 2.1 better describes the "largest common area" as the "living room, dining room or kitchen".

The text of exception 2.2 was deleted because the new 2.1 made it redundant and because the previous language of 2.2 was complicated.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This modification still provides potentially reduced construction and operating costs to those who choose to use balanced ventilation.

Final Action

RM22-18	**AMPC1**

M8515/M86-18 Part II

Date Submitted 2/5/2021	**Section** 1402.1	**Proponent** Mo Madani
Chapter 14	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

M2006.1, Reference Standard.

Original text of M2006.1 is not consistent with that of the 2020 FBC-R.

Summary of Modification

The UL Standard for Safety for Heating and Cooling Equipment, UL 1995 will be phased out by the year 2020, and will be replaced by UL 60335-2-40. Requirements include provisions for the most current technology and use of flammable refrigerants, and is currently being used to list new products.

Rationale

The UL Standard for Safety for Heating and Cooling Equipment, UL 1995 will be phased out by the year 2020, and will be replaced by UL 60335-2-40, the Standard for Safety for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers. UL 60335-2-40 is harmonized with requirements in Canada and Europe. These requirements include provisions for the most current technology and use of flammable refrigerants, and is currently being used to list new products. UL 412 and UL 471 will be phased out by the year 2020 and will be replaced by UL 60335-2-89.

Approved as Submitted

2018 International Residential Code

Revise as follows:

M1402.1 General. Oil-fired central furnaces shall conform to ANSI/UL 727. Electric furnaces shall conform to UL 1995 or UL/CSA 60335-2-40.

M2006.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall comply with UL 726. Electric pool and spa heaters shall comply with UL 1261. Pool and spa heat pump water heaters shall comply with UL 1995, UL/CSA 60335-2-40 or CSA C22.2 No. 236.

> **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or CSA C22.2 No. 218.1.

Update standard(s) as follows:

UL/CSA ~~/ANCE 60335-2-40—2012~~60335-2-40—2017: Standard for Household and Similar Electrical Appliances, Part 2: Particular Requirements for ~~Motor-compressors~~ Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

Code Change No: M86-18 Part II

Original Proposal

Section(s): M1402.1, M2006.1, UL Chapter 44, 44 UL

Proponents: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IMC COMMITTEE AND PART II WILL BE HEARD BY THE IRC M/P COMMITTEE. PLEASE SEE THE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Residential Code

Revise as follows:

M1402.1 General. Oil-fired central furnaces shall conform to ANSI/UL 727. Electric furnaces shall conform to UL 1995 or UL/CSA 60335-2-40.

M2006.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall comply with UL 726. Electric pool and spa heaters shall comply with UL 1261. Pool and spa heat pump water heaters shall comply with UL 1995, UL/CSA 60335-2-40 or CSA C22.2 No. 236.

> **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or CSA C22.2 No. 218.1.

Update standard(s) as follows:

UL/CSA ~~/ANCE 60335-2-40—2012~~60335-2-40—2017: Standard for Household and Similar Electrical Appliances, Part 2: Particular Requirements for ~~Motor-compressors~~ Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

Reason: The UL Standard for Safety for Heating and Cooling Equipment, UL 1995 will be phased out by the year 2020, and will be replaced by UL 60335-2-40, the Standard for Safety for Household and Similar Electrical Appliances, Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers. UL 60335-2-40 is harmonized with requirements in Canada and Europe. These requirements include provisions for the most current technology and use of flammable refrigerants, and is currently being used to list new products. UL 412 and UL 471 will be phased out by the year 2020 and will be replaced by UL 60335-2-89.

Cost Impact: The code change proposal will not increase or decrease the cost of construction.
It is not anticipated that the change in the product standards will increase the cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 9-1)

Assembly Action: **None**

Final Hearing Results

M86-18 Part II	**AS**

M9334/RM24-18

Date Submitted 2/24/2021	**Section** 202	**Proponent** Mo Madani
Chapter 15	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

M1505.1, M1505.4.3

Original text of this code change is not consistent with that of the 2020 FBC-R.

FBC-R/M1507.3.3

Summary of Modification

Proposes a ventilation rate credit for balanced systems.

Rationale

Please see attachment

Comment Period History

M9334-G1

Proponent Alan Gremillion **Submitted** 6/24/2021 **Attachments** No

Comment:

Unable to determine cost impact. It is dependent upon the credit that realized with the use of a balanced ventilation system and how this credit impacts the size of the equipment.

Comment Period History

M9334-G2

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change. Denial is requested to allow further study of the overall impact of the changes.

Comment Period History

M9334-G3

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change. Denial is requested to allow further study of the overall impact of the changes.

Comment Period History

M9334-G4

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change to allow further evaluation of the overall impact of the changes and possible consideration in Phase II of the process.

Approved as submitted (AS)

Add new text as follows:

BALANCED VENTILATION SYSTEM. A ventilation system where the total supply airflow and total exhaust airflow are simultaneously within 10% of their average. The balanced ventilation system airflow is the average of the supply and exhaust airflows.

Revise as follows:

M1505.1 General. Where local exhaust or whole-house mechanical ventilation is provided, the ~~equipment~~ ventilation system shall be designed in accordance with this section.

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate ~~as~~ not less than that determined in accordance with Table M1505.4.3(1) or not less than that determined by Equation 15-1.

Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1) **(Equation 15-1)**

Exceptions:

1. Ventilation rate credit. Where a whole-house mechanical balanced ventilation system is provided, the whole-house mechanical ventilation system rate shall be permitted to be adjusted by multiplying the ventilation rate determined in accordance with Table M1505.4.3(1) or by Equation 15-1 by 0.7.

2. Programmed intermittent operation. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1), by Equation 15-1, or by Exception 1 is multiplied by the factor determined in accordance with Table M1505.4.3(2).

Code Change No: RM24-18

Original Proposal

Section(s): 202, M1505.1, M1505.4.3

Proponents: Mike Moore, representing The Home Ventilating Institute (mmoore@newportventures.net)

2018 International Residential Code

Add new text as follows:

<u>**BALANCED VENTILATION SYSTEM.** A ventilation system where the total supply airflow and total exhaust airflow are simultaneously within 10% of their average. The balanced ventilation system airflow is the average of the supply and exhaust airflows.</u>

Revise as follows:

M1505.1 General. Where local exhaust or whole-house mechanical ventilation is provided, the ~~equipment~~ <u>ventilation system</u> shall be designed in accordance with this section.

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate ~~as~~ <u>not less than that</u> determined in accordance with Table M1505.4.3(1) or <u>not less than that determined by</u> Equation 15-1.

Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1) **(Equation 15-1)**

Exceptions:

1. <u>Ventilation rate credit. Where a whole-house mechanical balanced ventilation system is provided, the whole-house mechanical ventilation system rate shall be permitted to be adjusted by multiplying the ventilation rate determined in accordance with Table M1505.4.3(1) or by Equation 15-1 by 0.7.</u>
2. <u>Programmed intermittent operation.</u> The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1)<u>, by Equation 15-1, or by Exception 1</u> is multiplied by the factor determined in accordance with Table M1505.4.3(2).

Reason: This proposal is very similar to a PMGCAC proposal that also proposes a ventilation rate credit for balanced systems. The only difference between the proposals is that this proposal does not reference ASHRAE 62.2 as an optional path.

Balanced mechanical ventilation systems provide superior ventilation to unbalanced systems, and should not be required to provide the same rate as less effective, unbalanced systems to provide equivalent ventilation. This proposed credit for balanced ventilation is a simplified version that was derived from ASHRAE 62.2-2016 Equation 4.2 (published in addendum s). The ASHRAE equation adjusts the balanced whole house ventilation flow rate as a function of building air leakage, building height, and weather and shielding factor (which approximates climate zone). To simplify application of the ASHRAE calculation, we developed a one-size-fits-all balanced system factor using the following methodology:

1. Define a typical new, single-family detached home. The home characteristics were as follows: 2600 ft2; 3-bedroom; heights of 8, 17, and 26 feet above grade for one-, two- and three-story versions of the typical home; and leakage rate of 4.5 ACH50 in CZ 1-2 and 2.5 ACH50 in CZ 3-8. Note: Higher values for air leakage provide larger credits for balanced ventilation systems. To be conservative, we assumed that the average home was slightly tighter than the 2018 IECC maximum leakage rates of 5 ACH50 in CZ 1-2 and 3 ACH50 in CZ 3-8 (i.e., 4.5 ACH50 instead of 5 ACH50 in CZ 1-2 and 2.5 ACH50 instead of 3 ACH50 in CZ 3-8).

2. Calculate the average weather and shielding factor across each climate zone using over 1000 weather stations catalogued in Appendix B of ASHRAE 62.2.
3. Calculate the ASHRAE 62.2-2016 flow rates for balanced and unbalanced systems in the one-, two-, and three-story versions of the typical home across all IECC climate zones using Equation 4.2 and the average weather and shielding factors calculated in step 2.
4. Calculate the percent reduction in the balanced system ventilation rate versus the unbalanced systems' ventilation rate for each case. Apply weightings to the percent reductions for one-, two-, and three-story cases in each climate zone based on average U.S. Census Data (i.e., 44% are assumed to be one-story; 52% are assumed to be two-story; 4% are assumed to be 3-story in each climate zone). Sum the weighted percent reductions for the various stories to develop an estimated percent reduction for each climate zone.

Following is a table that summarizes interim and aggregate results of these steps used to calculate the balanced ventilation system multiplier of 0.7. The weighted average percent reduction in flow rate for balanced systems across each climate zone varied from 22% to 41%. The average percent reduction in flow rate for balanced systems across all scenarios for the typical home is ~30%, resulting in a multiplier of 0.7 in this proposal.

a

Percent Reduction Possible in Ventilation Fan Flow Rate When Specifying Balanced vs. Unbalanced: 4.5 ACH50 in CZ 1-2 & 2.5 ACH50 in CZ 3-8				
	Stories and Distribution			Weighted Average Across All Stories
	44%	52%	4%	
CZ	1-story	2-story	3-story	
1A	31%	42%	50%	38%
2A	30%	41%	49%	37%
2B	34%	46%	55%	41%
3A	18%	25%	29%	22%
3B	20%	27%	32%	24%
3C	21%	28%	34%	25%
4A	20%	27%	32%	24%
4B	24%	33%	39%	29%
4C	23%	31%	36%	27%
5A	23%	31%	37%	28%
5B	24%	33%	39%	29%
6A	25%	34%	40%	30%
6B	27%	37%	44%	33%
7	29%	39%	46%	35%
8	34%	46%	54%	41%
Average of weighted averages				31%

Cost Impact: The code change proposal will decrease the cost of construction
This proposal may decrease the cost of construction by approving specification of balanced systems with lower flow rates.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This is good for the code. The 10% average in the definition is better than RM22-18. This text is understandable and gives guidance for balancing reports. (Vote 10-0)

Assembly Action: **None**

Final Action

RM24-18 **AS**

M9335/RM29-18

Date Submitted 2/24/2021
Chapter 15
Section 1505.4.2
Affects HVHZ Yes
Proponent Mo Madani
Attachments Yes
TAC Recommendation Denied – Consent
Commission Action Pending Review
Staff Classification Correlates Directly

Comments
General Comments **Yes**

Related Modifications

M1505.4.2

This code change is already part of the 2020 FBC-R.

Summary of Modification

Requires controls to include text or a symbol indicating their function.

Rationale

Please see attachment

Comment Period History

M9335-G1

Proponent Alan Gremillion **Submitted** 6/24/2021 **Attachments** No

Comment:

Cost increase = $10

Comment Period History

M9335-G2

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change. Approval would create a conflict as this provision is in the FBC-R 7th Edition (2020) at Section M1507.3.2.

Approved as submitted (AS)

Revise as follows:

M1505.4.2 System controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override. <u>Controls shall include text or a symbol indicating their function.</u>

Code Change No: RM29-18

Original Proposal

Section(s): M1505.4.2

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

M1505.4.2 System controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override. Controls shall include text or a symbol indicating their function.

Reason: Tight dwelling units are being outfitted with code-mandated outdoor air/"whole-house" mechanical ventilation systems. These systems are often simply a bathroom exhaust fan expected to run continuously. The problem is that without a label indicating the system's function, occupants have no idea of the purpose of these systems and are likely to turn them off – thereby increasing the rate of accumulation of harmful indoor pollutants without their knowledge. *At a minimum*, these systems should be labeled to indicate that they are different than a typical bath fan. This proposed language would echo language in ASHRAE 62.2 and also within the 2018 IMC as follows: "403.3.2.4 System controls. Where provided within a dwelling unit, controls for outdoor air ventilation systems shall include text or a symbol indicating the system's function." The language is intended to be flexible enough to allow multiple options for the text or symbol, provided it achieves the intention of conveying that the control is for a system that is not merely a standard bath fan. For example, the Home Ventilating Institute (an industry association representing over 90% of the manufacturers of residential ventilating products in the U.S.), recently developed the following logo for this purpose:

FRESH AIR
VENTILATION SYSTEM
WWW.HVI.ORG/DUV

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction because a label will be required on a switch cover.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The proposal is consistent with the IMC and addresses only the whole house ventilation fans, not other fans. (Vote 8-1)

Assembly Action: **None**

Final Action

RM29-18	AS

M9338/RM33-18

Date Submitted 2/24/2021	**Section** 1601.1.7	**Proponent** Mo Madani
Chapter 16	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Correlates Directly
Commission Action Pending Review		

Comments

General Comments **Yes**

Related Modifications

M1601.1.1.7 (New)

Summary of Modification

Requires building cavities used as plenums to be sealed.

Rationale

Where stud cavities and joist cavities are used for return air, the negative pressure in the cavities can draw in outdoor air at any point where the cavities abut attic spaces, crawl spaces and outside walls. Sealing of the interface with attics, crawls and outside walls will reduce unwanted infiltration of outdoor air and will improve system efficiency.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Comment Period History

M9338-G1

Proponent Alan Gremillion **Submitted** 6/24/2021 **Attachments** No

Comment:

Cost increase = $300 - $500 (Dependent upon length of run)

Comment Period History

M9338-G2

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change.

Approved as submitted (AS)

Add new text as follows:

M1601.1.1.7 **Sealing.** Building cavities used as plenums shall be sealed.

Code Change No: RM33-18

Original Proposal

Section(s): M1601.1.1.7 (New)

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Add new text as follows:

M1601.1.1.7 **Sealing.** Building cavities used as plenums shall be sealed.

Reason: Where stud cavities and joist cavities are used for return air, the negative pressure in the cavities can draw in outdoor air at any point where the cavities abut attic spaces, crawl spaces and outside walls. Sealing of the interface with attics, crawls and outside walls will reduce unwanted infiltration of outdoor air and will improve system efficiency.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction because additional labor and sealants are required

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 8-1)

Assembly Action: **None**

Final Action

RM33-18	**AS**

M9336/RM30-18

Date Submitted 2/24/2021	**Section** 1505.3	**Proponent** Mo Madani
Chapter 18	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

M1505.3

Original text of this code change is not consistent with that of the 2020 FBC-R.

Summary of Modification

requires exhaust fans and whole-house mechanical ventilation fans to be listed and labeled as providing the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.

Rationale

Industry experience and research have shown that "for advertised airflows that are not certified, the actual installed airflow can be a small fraction of the advertised value".1 The 2018 IMC and IRC now require listing and labeling flows in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51 for exhaust equipment serving single dwelling units. This requirement should be expanded to all fans under the scope of the ANSI standard to ensure that flows are reported on an equivalent basis. AMCA and HVI maintain listings of products tested in accordance with the standard.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Approved as submitted (AS)

Revise as follows:

M1505.3 Exhaust equipment. Exhaust ~~equipment serving single dwelling units~~ fans and whole-house mechanical ventilation fans shall be listed and labeled as providing the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.

Code Change No: RM30-18

Original Proposal

Section(s): M1505.3

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

M1505.3 Exhaust equipment. Exhaust ~~equipment serving single dwelling units~~ fans and whole-house mechanical ventilation fans shall be listed and labeled as providing the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.

Reason: Industry experience and research have shown that "for advertised airflows that are not certified, the actual installed airflow can be a small fraction of the advertised value".[1] The 2018 IMC and IRC now require listing and labeling flows in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51 for exhaust equipment serving single dwelling units. This requirement should be expanded to all fans under the scope of the ANSI standard to ensure that flows are reported on an equivalent basis. AMCA and HVI maintain listings of products tested in accordance with the standard.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Bibliography:
1. Singer, B. C., Delp, W. W., Apte, M., & Price, P. N. (2011). Performance of Installed Cooking Exhaust Devices. LBNL-5265E. Berkeley, CA: Lawrence Berkeley National Laboratory.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The proposal refers to fans instead of just equipment. Approval was based on the proponent's published reason statement. (Vote 9-0)

Assembly Action: **None**

Final Action

RM30-18	**AS**

M9357/RM41-18

Date Submitted 2/25/2021	**Section** 2101.1	**Proponent** Mo Madani
Chapter 21	**Affects HVHZ** Yes	**Attachments** Yes
TAC Recommendation Denied – Consent		**Staff Classification** Overlap
Commission Action Pending Review		

Comments

General Comments **No**

Related Modifications

TABLE M2101.1

Summary of Modification

Adds ASTM F3253 to Table M2101.1

Rationale

ASTM's committee on plastics piping recently completed a new Standard, F3253 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems. This new system standard covers both the oxygen barrier PEX tubing as well as the performance and material requirements for the fittings. While this standard essentially mirrors the existing ASTM F876 and F877 PEX standards from a dimensional standpoint and existing fittings interchangeability, it also mandates the inclusion of an oxygen barrier layer with defined pass/fail criteria essentially equal with the industry's long accepted norm of DIN 4726 concerning allowed oxygen permeation. This new standard also requires a minimum pull-out strength test for the fittings not included in ASTM F877 today. The inclusion of this new standard in no way changes the acceptance of the existing ASTM F876 and F877 which will remain in the mechanical hydronics code for the foreseeable future.
This standard's project has been in works for nearly 4 years and represents the work and input from nearly all of the PEX tubing manufacturers in North America. Your support of this proposal is most appreciated.
A similar proposal is being submitted for Chapter 12 of the IMC.

Approved as submitted (AS)

Revise as follows:

TABLE M2101.1

HYDRONIC PIPING AND FITTING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Acrylonitrile butadiene styrene (ABS) plastic pipe	1, 5	ASTM D1527 ASTM F2806 ASTM F2969	Solvent cement joints	—
Chlorinated poly (vinyl chloride) (CPVC) pipe and tubing	1, 2, 3	ASTM D2846	Solvent cement joints, compression joints and threaded adapters	—
Copper and copper-alloy pipe	1	ASTM B42, B43, B302	Brazed, soldered and mechanical fittings threaded, welded and flanged	—
Copper and copper-alloy tubing (Type K, L or M)	1, 2	ASME B16.51, ASTM B75, B88, B135, B251, B306	Brazed, soldered, press-connected and flared mechanical fittings	Joints embedded in concrete shall brazed
Cross-linked polyethylene (PEX)	1, 2, 3	ASTM F876; ASTM F3253	(See PEX fittings)	Install in accordance with manufacture instructions
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	1, 2	ASTM F1281 or CAN/ CSA B137.10	Mechanical, crimp/insert	Install in accordance with manufacture instructions
PEX fittings	ASTM F877 ASTM F1807 ASTM F1960 ASTM F2098 ASTM F2159 ASTM F2735; ASTM F3253	Copper crimp/insert fittings, cold expansion fittings, stainless steel clamp, insert fittings	Install in accordance with manufacturer's instructions	

Polybutylene (PB) pipe and tubing	1, 2, 3	ASTM D3309	Heat-fusion, crimp/insert and compression	Joints in concret shall be heat-fus
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F1282 CSA B 137.9	Mechanical, crimp/insert	—
Polypropylene (PP)	1, 2, 3	ISO 15874 ASTM F2389	Heat-fusion joints, mechanical fittings, threaded adapters, compression joints	—
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F2623 ASTM F2769, CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Raised temperature polyethylene (PE-RT) fittings	1, 2,3	ASTM D3261 ASTM F1807 ASTM F2098 ASTM F2159 ASTM F2735 ASTM F2769 CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Steel pipe	1, 2	ASTM A53 ASTM A106	Brazed, welded, threaded, flanged and mechanical fittings	Joints in concret shall be welded. Galvanized pipe shall not be welded or brazed
Steel tubing	1	ASTM A254	Mechanical fittings, welded	—

For SI: °C = [(°F)-32]/1.8.

a. Use code:

1. Above ground.
2. Embedded in radiant systems.
3. Temperatures below 180°F only.
4. Low temperature (below 130°F) applications only.
5. Temperatures below 160°F only.

b. Standards as listed in Chapter 44.

Code Change No: RM41-18

Original Proposal

Section(s): TABLE M2101.1

Proponents: Gary Morgan, Viega LLC, representing Viega LLC (gary.morgan@viega.us); LANCE MacNevin, Plastics Pipe Institute, representing Plastics Pipe Institute (Lmacnevin@plasticpipe.org)

2018 International Residential Code

Revise as follows:

TABLE M2101.1
HYDRONIC PIPING AND FITTING MATERIALS

MATERIAL	USE CODE [a]	STANDARD [b]	JOINTS	NOTES
Acrylonitrile butadiene styrene (ABS) plastic pipe	1, 5	ASTM D1527 ASTM F2806 ASTM F2969	Solvent cement joints	—
Chlorinated poly (vinyl chloride) (CPVC) pipe and tubing	1, 2, 3	ASTM D2846	Solvent cement joints, compression joints and threaded adapters	—
Copper and copper-alloy pipe	1	ASTM B42, B43, B302	Brazed, soldered and mechanical fittings threaded, welded and flanged	—
Copper and copper-alloy tubing (Type K, L or M)	1, 2	ASME B16.51, ASTM B75, B88, B135, B251, B306	Brazed, soldered, press-connected and flared mechanical fittings	Joints embedded in concrete shall be brazed
Cross-linked polyethylene (PEX)	1, 2, 3	ASTM F876; <u>ASTM F3253</u>	(See PEX fittings)	Install in accordance with manufacturer's instructions
Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	1, 2	ASTM F1281 or CAN/ CSA B137.10	Mechanical, crimp/insert	Install in accordance with manufacturer's instructions

PEX fittings		ASTM F877 ASTM F1807 ASTM F1960 ASTM F2098 ASTM F2159 ASTM F2735; ASTM F3253	Copper crimp/insert fittings, cold expansion fittings, stainless steel clamp, insert fittings	Install in accordance with manufacturer's instructions
Polybutylene (PB) pipe and tubing	1, 2, 3	ASTM D3309	Heat-fusion, crimp/insert and compression	Joints in concrete shall be heat-fused
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F1282 CSA B 137.9	Mechanical, crimp/insert	—
Polypropylene (PP)	1, 2, 3	ISO 15874 ASTM F2389	Heat-fusion joints, mechanical fittings, threaded adapters, compression joints	—
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F2623 ASTM F2769, CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Raised temperature polyethylene (PE-RT) fittings	1, 2,3	ASTM D3261 ASTM F1807 ASTM F2098 ASTM F2159 ASTM F2735 ASTM F2769 CSA B137.18	Copper crimp/insert fitting, stainless steel clamp, insert fittings	—
Steel pipe	1, 2	ASTM A53 ASTM A106	Brazed, welded, threaded, flanged and mechanical fittings	Joints in concrete shall be welded. Galvanized pipe shall not be welded or brazed.
Steel tubing	1	ASTM A254	Mechanical fittings, welded	—

For SI: °C = [(°F)-32]/1.8.

a. Use code:
   1. Above ground.
   2. Embedded in radiant systems.
   3. Temperatures below 180°F only.
   4. Low temperature (below 130°F) applications only.
   5. Temperatures below 160°F only.

b. Standards as listed in Chapter 44.

Reason: ASTM's committee on plastics piping recently completed a new Standard, F3253 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems. This new system standard covers both the oxygen barrier PEX tubing as well as the performance and material requirements for the fittings. While this standard essentially mirrors the existing ASTM F876 and F877 PEX standards from a dimensional standpoint and existing fittings interchangeability, it also mandates the inclusion of an oxygen barrier layer with defined pass/fail criteria essentially equal with the industry's long accepted norm of DIN 4726 concerning allowed oxygen permeation. This new standard also requires a minimum pull-out strength test for the fittings not included in ASTM F877 today. The inclusion of this new standard in no way changes the acceptance of the existing ASTM F876 and F877 which will remain in the mechanical hydronics code for the foreseeable future.

This standard's project has been in works for nearly 4 years and represents the work and input from nearly all of the PEX tubing manufacturers in North America. Your support of this proposal is most appreciated.

A similar proposal is being submitted for Chapter 12 of the IMC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of this new standard simply offers an alternative product that uses products which are relatively identical in cost today to existing pipe and fitting materials.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval was based on the proponent's published reason statement. (Vote 10-0)

Assembly Action: **None**

Final Action

RM41-18 **AS**

TAC: Mechanical

Total Mods for **Mechanical** in **: 3**

Total Mods for report: 97

Sub Code: Mechanical

M8452/M25-18

95

Date Submitted 2/3/2021
Chapter 4

Section 403.3.1.1
Affects HVHZ Yes

Proponent Mo Madani
Attachments Yes

TAC Recommendation Pulled of Consent by Interested Entity
Commission Action Pending Review

Staff Classification Correlates Directly

Comments

General Comments **No**

Related Modifications

Table 403.3.1.1

Approved as Submitted

Summary of Modification

This proposal seeks to update the existing ventilation rate table in the IMC. Standard 62.1 is the source material for this table, and this updates table 403.3.1.1 to match the appropriate ventilation rates in 62.1-2016.

Rationale

This update is based on technical justification from the ASHRAE process and makes the table consistent with the exhaust rates in Section 403.3.2.3. (Vote 11-0)

Approved as Submitted

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT[2 a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT[2 a]	EXHAUST AIRFLOW RATE CFM/FT[2 a]
Correctional facilities				
Booking/waiting	50	7.5	0.06	—
Cells				
without plumbing fixtures	25	5	0.12	—
with plumbing fixtures[g]	25	5	0.12	1
Day room	30	5	0.06	—
Dining halls (see “Food and beverage service”)	—	—	—	—
Guard stations	15	5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	0.12	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	~~25~~ 5	~~—~~ 0.12	—
Storage, pick up	30	7.5	0.12	—
Education				
Art classroom[g]	20	10	0.18	0.7
Auditoriums	150	5	0.06	—
Classrooms (ages 5-8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Computer lab	25	10	0.12	—
Corridors (see “Public spaces”)	—	—	—	—
Day care (through age 4)	25	10	0.18	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Locker/dressing rooms[g]	—	—	—	0.25
Media center	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—

Music/theater/dance	35	10	0.06	—
Science laboratories[g]	25	10	0.18	1
Smoking lounges[b]	70	60	—	—
Sports locker rooms[g]	—	—	—	0.5
Wood/metal shops[g]	20	10	0.18	0.5
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking)b	20	7.5	0.12	0.7
Hotels, motels, resorts and dormitories				
Bathrooms/toilet—private[g]	—	—	—	25/50f
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas	20	5	0.06	—
Gambling casinos	120	7.5	0.18	—
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	5	0.06	—
Offices				
Conference rooms	50	5	0.06	—
Main entry lobbies	10	5	0.06	—
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Kitchens[b]	—	—	—	~~25~~ 50/100f
Living areas[c]	Based on number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms[g]	—	—	—	~~20~~ 25/50f
Public spaces				
Corridors	—	—	0.06	—
Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—

Shower room (per shower head)g	—	—	—	50/20f
Smoking lounges[b]	70	60	—	—
Toilet rooms — public[g]	—	—	—	50/70e
Retail stores, sales floors and showroom floors				
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Sales	15	7.5	0.12	—
Shipping and receiving	2	10	0.12	—
Smoking lounges[b]	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see “Storage”)	—	10	0.06	—
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Nail salons[b, h]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2
Pet shops (animal areas)b	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Bowling alleys (seating areas)	40	10	0.12	—
Disco/dance floors	100	20	0.06	—
Game arcades	20	7.5	0.18	—
Gym, stadium, arena (play area)	7	20	0.18	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Ice arenas without combustion engines	—	—	0.3	0.5
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Storage				
Repair garages, enclosed parking garages[b,d]	—	—	—	0.75
Refrigerated warehouses/freezers	—	10	—	0.75
Warehouses	—	10	0.06	—
Theaters				

Auditoriums (see "Education")	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Computer (without printing)	4	5	0.06	—
Copy, printing rooms	4	5	0.06	0.5
Darkrooms	—	—	—	1
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) -32]/1.8, 1 square foot = 0.0929 m^2.

a. Based on net occupiable floor area.

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404.

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g.. Mechanical exhaust is required and recirculation from such spaces is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a source capture system capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon

Code Change No: M25-18

Original Proposal

Section(s): TABLE 403.3.1.1

Proponents: Connor Barbaree, ASHRAE, representing ASHRAE (cbarbaree@ashrae.org)

2018 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} a	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} a	EXHAUST AIRFLOW RATE CFM/FT^{2} a
Correctional facilities				
Booking/waiting	50	7.5	0.06	—
Cells				
without plumbing fixtures	25	5	0.12	—
with plumbing fixtures[g]	25	5	0.12	1
Day room	30	5	0.06	—
Dining halls (see "Food and beverage service")	—	—	—	—
Guard stations	15	5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	0.12	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	~~25~~ 5	~~—~~ 0.12	—
Storage, pick up	30	7.5	0.12	—
Education				
Art classroom[g]	20	10	0.18	0.7
Auditoriums	150	5	0.06	—
Classrooms (ages 5-8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Computer lab	25	10	0.12	—
Corridors (see "Public spaces")	—	—	—	—

Day care (through age 4)	25	10	0.18	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Locker/dressing rooms[g]	—	—	—	0.25
Media center	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Music/theater/dance	35	10	0.06	—
Science laboratories[g]	25	10	0.18	1
Smoking lounges[b]	70	60	—	—
Sports locker rooms[g]	—	—	—	0.5
Wood/metal shops[g]	20	10	0.18	0.5
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking)b	20	7.5	0.12	0.7
Hotels, motels, resorts and dormitories				
Bathrooms/toilet—private[g]	—	—	—	25/50f
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas	20	5	0.06	—
Gambling casinos	120	7.5	0.18	—
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	5	0.06	—
Offices				
Conference rooms	50	5	0.06	—
Main entry lobbies	10	5	0.06	—
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Kitchens[b]	—	—	—	~~25~~ <u>50</u>/100f
Living areas[c]	Based on number of bedrooms. First bedroom, 2; each additional bedroom, 1	0.35 ACH but not less than 15 cfm/person	—	—
Toilet rooms and bathrooms[g]	—	—	—	~~20~~ <u>25</u>/50f
Public spaces				
Corridors	—	—	0.06	—

Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—
Shower room (per shower head)g	—	—	—	50/20f
Smoking lounges[b]	70	60	—	—
Toilet rooms — public[g]	—	—	—	50/70e
Retail stores, sales floors and showroom floors				
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Sales	15	7.5	0.12	—
Shipping and receiving	2	10	0.12	—
Smoking lounges[b]	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see "Storage")	—	10	0.06	—
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Nail salons[b, h]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2
Pet shops (animal areas)b	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Bowling alleys (seating areas)	40	10	0.12	—
Disco/dance floors	100	20	0.06	—
Game arcades	20	7.5	0.18	—
Gym, stadium, arena (play area)	7	20	0.18	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Ice arenas without combustion engines	—	—	0.3	0.5
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Storage				

Repair garages, enclosed parking garages[b,d]	—	—	—	0.75
Refrigerated warehouses/freezers	—	10	—	0.75
Warehouses	—	10	0.06	—
Theaters				
Auditoriums (see "Education")	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Computer (without printing)	4	5	0.06	—
Copy, printing rooms	4	5	0.06	0.5
Darkrooms	—	—	—	1
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) -32]/1.8, 1 square foot = 0.0929 m^2.

a. Based on net occupiable floor area.
b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).
c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
d. Ventilation systems in enclosed parking garages shall comply with Section 404.
e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
g.. Mechanical exhaust is required and recirculation from such spaces is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).
h. For nail salons, each manicure and pedicure station shall be provided with a source capture system capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

Reason: This proposal seeks to update the existing ventilation rate table in the IMC. Standard 62.1 is the source material for this table, and this updates table 403.3.1.1 to match the appropriate ventilation rates in 62.1-2016.

Bibliography:
ASHRAE Standard 62.1-2016

Cost Impact: This proposal revises ventilation rates for specific spaces within varying occupancy classifications. For systems where the exhaust airflow rate was increased, these systems also had a minimum and maximum ventilation rate based on the frequency of occupation within that space. The exhaust airflow values that were increased were the minimum values for kitchens and restrooms. These spaces are infrequently occupied, leading to the maximum value of exhaust ventilation being required. Therefore, this proposal does increase the cost of construction.

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Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: This update is based on technical justification from the ASHRAE process and makes the table consistent with the exhaust rates in Section 403.3.2.3. (Vote 11-0)

Assembly Action: **None**

Final Hearing Results

M25-18 **AS**

M9296/RM10-18

96

Date Submitted 2/24/2021
Chapter 14

Section 1411.6
Affects HVHZ Yes

Proponent Mo Madani
Attachments Yes

TAC Recommendation Pulled of Consent by Interested Entity
Commission Action Pending Review

Staff Classification Correlates Directly

Comments
General Comments **Yes**

Related Modifications

M1411.6

This code change is already part of the 2020 FBC-R.

TAC Action - Approved as Submitted - Consent

Summary of Modification

Revises the section for consistency with the Chapter 11 energy provisions.

Rationale

This change is simply for consistency with the Chapter 11 energy provisions. The two insulation requirements did not match and caused confusion.
This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Comment Period History

M9296-G1

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:
The Florida Home Builders Association (FHBA) requests approval of this code change.

Approved as submitted (AS)

Revise as follows:

M1411.6 Insulation of refrigerant piping. Piping and fittings for refrigerant vapor (suction) lines shall be insulated with insulation having a thermal resistivity of not less than R-4 3 and having external surface permeance not exceeding 0.05 perm [2.87 ng/(s • m^2 • Pa)] when tested in accordance with ASTM E96.

Code Change No: RM10-18

Original Proposal

Section(s): M1411.6

Proponents: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

M1411.6 Insulation of refrigerant piping. Piping and fittings for refrigerant vapor (suction) lines shall be insulated with insulation having a thermal resistivity of not less than R-~~4~~ 3 and having external surface permeance not exceeding 0.05 perm [2.87 ng/(s • m^2 • Pa)] when tested in accordance with ASTM E96.

Reason: This change is simply for consistency with the Chapter 11 energy provisions. The two insulation requirements did not match and caused confusion.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: R-3 insulation is readily available and used. This change is consistent with Chapter 11 provisions for insulation. (Vote 9-0)

Assembly Action: **None**

Final Action

RM10-18	**AS**

M9314/RM11-18

Date Submitted	2/24/2021	**Section**	1411.8	**Proponent**	Mo Madani
Chapter	14	**Affects HVHZ**	Yes	**Attachments**	Yes
TAC Recommendation	Pulled of Consent by Interested Entity			**Staff Classification**	Correlates Directly
Commission Action	Pending Review				

Comments

General Comments **Yes**

Related Modifications

M1411.8 (New)

TAC Action - Approved as Submitted - Consent

Summary of Modification

Adds new section "Support of Refrigerant Piping"

Rationale

This proposal will require support of the Refrigerant piping which vibrates and that can lead to damage of piping and joints from vibration and stress. Unfortunately many refrigerant pipes are not supported from the condenser, or the only support is foam , caulking in the walls penetration. This proposal will require supporting of the piping to ensure safety, reduce piping ,and joints damage from vibration and stress.

Comment Period History

M9314-G1

Proponent Michael Silvers (FRSA **Submitted** 6/16/2021 **Attachments** No

Comment:

FRSA request a Motion to Approve: FRSA urges the TAC to approve the provision of this Mod in the TAC's recommendations to the Commission and that it should be incorporated into the FBC.

Comment Period History

M9314-G2

Proponent Alan Gremillion **Submitted** 6/24/2021 **Attachments** No

Comment:

Cost increase = $40

Mechanical contractor will now be required to install blocks on or near the equipment pad to strap the refrigerant line to in lieu of laying the lines on the ground or floating them above the ground from the condenser to the home.

Comment Period History

M9314-G3

Proponent Joseph Belcher **Submitted** 6/28/2021 **Attachments** No

Comment:

The Florida Home Builders Association (FHBA) requests denial of this code change.

Approved as Modified (AM)

Add new text as follows:

M1411.8 Support of Refrigerant piping. Refrigerant piping & tubing shall be securely fastened to a permanent support within 6 feet of the compressor and within 3 feet of each subsequent bend or angle.

Committee Action: **Approved as Modified**

Modify proposal as follows:

M1411.8 Support of Refrigerant piping. Refrigerant piping & tubing shall be securely fastened to a permanent support within 6 feet of the ~~compressor~~ condensing unit. ~~and within 3 feet of each subsequent bend or angle.~~

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Code Change No: RM11-18

Original Proposal

Section(s): M1411.8 (New)

Proponents: Howard Ahern, Airex Manufacturing, representing Airex Manufacturing (howard.ahern@airexmfg.com)

2018 International Residential Code

Add new text as follows:

M1411.8 Support of Refrigerant piping. Refrigerant piping & tubing shall be securely fastened to a permanent support within 6 feet of the compressor and within 3 feet of each subsequent bend or angle.

Reason: This proposal will require support of the Refrigerant piping which vibrates and that can lead to damage of piping and joints from vibration and stress. Unfortunately many refrigerant pipes are not supported from the condenser, or the only support is foam , caulking in the walls penetration. This proposal will require supporting of the piping to ensure safety, reduce piping ,and joints damage from vibration and stress.

Bibliography:
Howard Ahern representing Airex Manufacturing National Sales and Technical Manager

Cost Impact: The code change proposal will decrease the cost of construction
The piping should already be supported.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify proposal as follows:

M1411.8 Support of Refrigerant piping. Refrigerant piping & tubing shall be securely fastened to a permanent support within 6 feet of the ~~compressor~~ condensing unit. ~~and within 3 feet of each subsequent bend or angle.~~

Committee Reason: Approval was based on the proponent's published reason statement. The modification deletes the support within 3 feet of bends which was extreme. (Vote 10-0)

Assembly Action: **None**

Final Action

RM11-18	AM