M2-21

Original Proposal

IMC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

International Mechanical Code

2021 International Mechanical Code

Revise as follows:

CONDENSING UNIT. ~~A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.~~
A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more power-driven compressors, condensers, liquid receivers (where required) and factory-supplied accessories.

Reason: There are two different definitions in the I-codes for “condensing unit”. The IECC definition does not identify the compressors as “power-driven”, whereas the IMC definition does. The proposed common definition for use in the I-codes is an amalgamation of the IECC and IMC definitions, which also correlate with the definition of this term in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.

For information purposes, the following are the other definitions:

From the**IECC: CONDENSING UNIT**. A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively cooled, or water-cooled), condenser fans and motors(where used) and factory-supplied accessories.
From the IMC: CONDENSING UNIT. A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.

From ASHRAE 15: CONDENSING UNIT a combination of one or more power-driven compressors, condensers, liquid receivers (when required), and regularly furnished accessories. From UL 60335-2-40: CONDENSING UNIT factory-made assembly that includes one or more motor-compressors, CONDENSER in cooling mode and motor-driven fan, blower or pump to circulate the heat transfer fluid through the CONDENSER with associated operational controls in addition to the necessary wiring

A change in Group B will be needed for IECC

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal only provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This is editorial and is important to have consistency within the family of I-codes. (Vote: 7-4)

Final Hearing Results

M3-21

Original Proposal

IMC: SECTION 202 (New)

Proponents: Tim Earl, GBH International, The Gypsum Association (tearl@gbhinternational.com)

2021 International Mechanical Code

Add new definition as follows:

GYPSUM BOARD

. A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing.

GYPSUM WALLBOARD

. A gypsum board used primarily as an interior surfacing for building structures.

Reason: This defines terms already used in the code, using definitions already in the IBC and proposed for several other I-Codes this cycle that are also harmonized to ASTM and the industry.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a simple terminology update with no impact on cost.

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: The committee felt that terms currently defined in other I-codes should be revised in the code of origin before being duplicated in this code. The change should come back after that is accomplished. (Vote: 8-3)

Public Comments

Public Comment 1

Proponents: Tim Earl, GBH International, The Gypsum Association (tearl@gbhint.com) requests As Submitted

Commenter's Reason: These terms are used in the IMC and should be defined there. Some committee members questioned the harmonization of the terms across the I-codes. However, as one committee member pointed out, some of those terms are in sections to be addressed in Group B. In order to achieve complete harmonization across the codes, this change must be approved first, to match already drafted changes for Group B codes.

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction
This is a terminology update with no impact on cost.

Final Hearing Results

M4-21 Part I

Original Proposal

IMC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Delete and substitute as follows:

~~**HEAT PUMP.** A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.~~

HEAT PUMP.

A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

Reason: There are two different definitions in the I-codes for “heat pump”. The IRC definition identifies heat pumps as an appliance, and the IMC identifies heat pumps as are refrigeration system. This definition is clarifying that a heat pump could be either an appliance or a refrigeration system. This definition is also simplified that a heat pump is transferring heat into a space or substance. The reference to “beneficial purpose” in the IMC is commentary. The proposed new common definition is closely aligned with the term used in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.
For information purposes, the following are the other definitions:

From the IRC: [MP] HEAT PUMP. An appliance having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.

From the IMC: HEAT PUMP. A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.

From ASHRAE 15: HEAT PUMP a refrigerating system used to transfer heat into a space or substance.
From UL 60335-2-40: HEAT PUMP appliance which takes up heat at a certain temperature and releases heat at a higher temperature

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee agrees this is editorial. Based on the reason statement, the definition is clarifying and is closely aligned with the term used in the two refrigeration standards referenced in the I-codes (ASHRAE 15 and UL 60335-2-40). (Vote: 6-5)

Final Hearing Results

M4-21 Part I AS

M4-21 Part II

Original Proposal

IRC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Residential Code

Delete and substitute as follows:

~~**[MP] HEAT PUMP.** An *appliance* having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.~~

[MP] HEAT PUMP.

A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

Reason: There are two different definitions in the I-codes for “heat pump”. The IRC definition identifies heat pumps as an appliance, and the IMC identifies heat pumps as are refrigeration system. This definition is clarifying that a heat pump could be either an appliance or a refrigeration system. This definition is also simplified that a heat pump is transferring heat into a space or substance. The reference to “beneficial purpose” in the IMC is commentary. The proposed new common definition is closely aligned with the term used in the two refrigeration standards referenced in the I-codes, ASHRAE 15 and UL 60335-2-40.
For information purposes, the following are the other definitions:

From the IRC: [MP] HEAT PUMP. An appliance having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid or other sources.

From the IMC: HEAT PUMP. A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a second substance at a higher temperature for a beneficial purpose.

From ASHRAE 15: HEAT PUMP a refrigerating system used to transfer heat into a space or substance.
From UL 60335-2-40: HEAT PUMP appliance which takes up heat at a certain temperature and releases heat at a higher temperature

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: The definition is not consistent for the consumer trying to do construction, which may be the homeowner. (6-5)

Public Comments

Public Comment 1

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (pmgcac@iccsafe.org) requests As Submitted

Commenter's Reason: M4-21 Part I was approved as submitted. For consistency between the IRC mechanical and the IMC. A term that is used throughout the I-codes should have the same definition. This proposal needs to be approved for consistency. There was no opposing testimony on this proposal.
The PMGCAC is puzzled by the Committee's published reason statement for disapproval. We do not understand why "consumers" or "homeowners" would be confused by the revised definition in a *code*. Code definitions are only for support of the code text where that defined term is used.

One committee member mentioned that the revised definition does not meet the "Websters" definition... Here is Webster's definition (note the underline):

": an apparatus for heating or cooling (such as a building) by transferring heat by mechanical means from or to an external reservoir (such as the ground, water, or outside air)"

From the Energy.gov webpage on Heat Pumps:

"For climates with moderate heating and cooling needs, heat pumps offer an energy-efficient alternative to furnaces and air conditioners. Like your refrigerator, heat pumps use electricity to move heatfrom a cool space to a warm space, making the cool space cooler and the warm space warmer. During the heating season, heat pumps move heatfrom the cool outdoors into your warm house and during the cooling season, heat pumps move heat from your cool house into the warm outdoors. Because they move heat rather than generate hea,t heat pumps can provide equivalent space conditioning at as little as one quarter of the cost of operating conventional heating or cooling appliances."

We urge the voters to approve this proposal to make terminology consistent across the codes and in agreement with other standards.

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction
This proposal is only a clarification of a definition.

Final Hearing Results

M4-21 Part II AS

M5-21

Original Proposal

IMC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

LOWER FLAMMABLE LIMIT (REFRIGERANT) (LFL). The minimum concentration of refrigerant ~~that is~~ at which a flame is capable of propagating ~~a flame~~ through a homogeneous mixture of refrigerant and air under specific test conditions in accordance with ASHRAE 34.

Reason: The current definition implies that it is the concentration that is the substance capable of propagating the flame, instead of the flame being what is capable. This proposal clarifies that the flame propagation is determined under specific test conditions in ASHRAE 34.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The clarification of this definition does not change what is required by the code and as such, it doesn't change the materials or labor required to comply with the code.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The current definition implies that it is the concentration that is the substance capable of propagating the flame, instead of the flame being what is capable. This proposal clarifies that the flame propagation is determined under specific test conditions in ASHRAE 34. (Vote: 7-4)

Final Hearing Results

M5-21 AS

M6-21

Original Proposal

IMC: SECTION 202

Proponents: Tim Earl, GBH International, GBH International (tearl@gbhinternational.com)

2021 International Mechanical Code

Revise as follows:

NONCOMBUSTIBLE MATERIALS. A material that passes ASTM E136. ~~Materials that, when tested in accordance with ASTM E136, have not fewer than three of four specimens tested meeting all of the following criteria:~~

1. ~~The recorded temperature of the surface and interior thermocouples shall not at any time during the test rise more than 54ºF (30ºC) above the furnace temperature at the beginning of the test.~~

2. ~~There shall not be flaming from the specimen after the first 30 seconds~~.

3. ~~If the weight loss of the specimen during testing exceeds 50 percent, the recorded temperature of the surface and interior thermocouples shall not at any time during the test rise above the furnace air temperature at the beginning of the test, and there shall not be flaming of the specimen.~~

Reason: This proposal revises the definition of NONCOMBUSTIBLE to match the other codes. The current definition contains specific test details taken from ASTM E136 which is unnecessary. ASTM E136 contains clear pass/fail criteria, so the new definition is accurate, and consistent with the other ICC codes which were revised last cycle.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This simply revises the definition to make it simpler, with no impact on cost.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal revises the definition of NONCOMBUSTIBLE to match the other codes. The standard will align with definition done during last cycle, defining material that passes ASTM. (Vote: 11-0)

Final Hearing Results

M6-21 AS

M8-21 Part I

Original Proposal

IMC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A THREE PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART III WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Delete and substitute as follows:

~~**REFRIGERANT.** A substance utilized to produce refrigeration by its expansion or vaporization.~~

REFRIGERANT.

The fluid used for heat transfer in a refrigeration system that undergoes a change of state to absorb heat

Reason: There are three different definitions in the I-codes for “refrigerant”. This proposal is to use the current definition for the term in the IFC. The IFC definition provides the best detail as to what a refrigerant is, and aligns with ASHRAE 15, which is referenced in the IMC. The IRC and IMC definitions are not as precise.

For information purposes, the following are the other definitions:

From the IRC: [MP] REFRIGERANT. A substance used to produce refrigeration by its expansion or evaporation.

From the IMC: REFRIGERANT. A substance utilized to produce refrigeration by its expansion or vaporization.

From ASHRAE 15: REFRIGERANT the fluid used for heat transfer in a refrigerating system; the refrigerant absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a change of state.

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

This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Necessary for correlation of other ICC I-codes and aligns with ASHRAE 15, which is referenced in the IMC.. (Vote: 10-0)

Final Hearing Results

M8-21 Part I AS

M8-21 Part II

Original Proposal

IFC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A THREE PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART 3 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Fire Code

Revise as follows:

REFRIGERANT.

The fluid used for heat transfer in a refrigeration system; ~~the refrigerant~~ that undergoes a change of state to absorb heat.

Reason: There are three different definitions in the I-codes for "refrigerant". This proposal is to use the current definition for the term in the IFC. The IFC definition provides the best detail as to what a refrigerant is, and aligns with ASHRAE 15, which is referenced in the IMC. The IRC and IMC definitions are not as precise.
For information purposes, the following are the other definitions:

From the IRC: [MP] REFRIGERANT. A substance used to produce refrigeration by its expansion or evaporation.

From the IMC: REFRIGERANT. A substance utilized to produce refrigeration by its expansion or vaporization.

From ASHRAE 15: REFRIGERANT the fluid used for heat transfer in a refrigerating system; the refrigerant absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a change of state.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action — As Submitted

Committee Reason: This proposal was approved to make the definitions consistent between the IFC, IMC and IRC. (Vote: 13-1)

Final Hearing Results

M8-21 Part II — AS

M8-21 Part III

Original Proposal

IRC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A THREE PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE AND PART 3 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Residential Code

Delete and substitute as follows:

~~**[MP] REFRIGERANT.** A substance used to produce refrigeration by its expansion or evaporation.~~
[MP] REFRIGERANT.
The fluid used for heat transfer in a refrigeration system that refrigerant undergoes a change of state to absorb heat.

Reason: There are three different definitions in the I-codes for "refrigerant". This proposal is to use the current definition for the term in the IFC. The IFC definition provides the best detail as to what a refrigerant is, and aligns with ASHRAE 15, which is referenced in the IMC. The IRC and IMC definitions are not as precise.
For information purposes, the following are the other definitions:

From the IRC: [MP] REFRIGERANT. A substance used to produce refrigeration by its expansion or evaporation.

From the IMC: REFRIGERANT. A substance utilized to produce refrigeration by its expansion or vaporization.

From ASHRAE 15: REFRIGERANT the fluid used for heat transfer in a refrigerating system; the refrigerant absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a change of state.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
[MP] REFRIGERANT. The fluid used for heat transfer in a refrigeration system that ~~refrigerant~~ undergoes a change of state to absorb heat.

Committee Reason: For the modification: The modification makes more sense. It correlates between the codes and clarifies the IRC definition.
For the proposal as modified: It will correlate between the three codes. (11-0)

Final Hearing Results

M8-21 Part III AM

M9-21

Original Proposal

IMC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

REFRIGERANT SAFETY GROUP CLASSIFICATION. The ~~alphabetical/numerical~~ alphanumeric designation that indicates both the toxicity and flammability classifications of refrigerants in accordance with ASHRAE 34.

Delete without substitution:

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

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

Reason: This proposal clarifies that the method for determining the various flammability and toxicity classifications are in accordance with Chapter 6 of ASHRAE 34. Relocating the definitions for “flammability classification” and “toxicity classification” as sub-definitions directly under the definition “refrigerant safety classification” provides for easier use and application of the code. These two relocated terms only apply to the main definition.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity as to what specific conditions differentiate between the various flammability and toxicity classes of refrigerants.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

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

Class 1. Indicates a refrigerant with no flame propogation.

Class 2. Indicates a refrigerant with low flammability.

Class 2L. Indicates a refrigerant with low flammability and low burning velocity.

Class 3. Indicates a refrigerant with high flammability.

TOXICITY CLASSIFICATION (REFRIGERANT). An alphabetical designation used to identify thetoxicityof refrigerants. Class A indicates a refrigerant with low toxicity. Class B indicates arefrigerant with high toxicity.

Committee Reason: This proposal clarifies that refrigerant safety group classifications are determined in accordance with ASHRAE 34.

The modification appropriately relocates the definitions for “flammability classification” and “toxicity classification” as sub-definitions directly under the definition “refrigerant safety classification” provides for easier use and application of the code. These two relocated terms only apply to the main definition.(Vote: 10-0, 1 abstained)

Final Hearing Results	
M9-21	AM

M10-21 Part I

Original Proposal

IMC: SECTION 202; IFC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

REFRIGERATION ~~REFRIGERATING~~ SYSTEM

.

A combination of interconnected parts in which a refrigerant is enclosed and ~~refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant~~ is circulated for the purpose of extractingthen rejecting heat.

Reason: The proposal will better correlate the I-Codes with the industry standards, ASHRAE 15, for using the term refrigeration system rather than refrigerating systems. No technical change is intended.

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

This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee agreed that he proposal will better correlate the I-Codes with the industry standards, ASHRAE 15, for using the term refrigeration system rather than refrigerating systems. (Vote: 10-0)

Final Hearing Results

M10-21 Part I AS

M10-21 Part II

Original Proposal

IRC: SECTION 202

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE AND FIRE CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Revise as follows:

[MP]
~~REFRIDGERATING~~ REFRIGERATION SYSTEM

.
A combination of interconnected parts ~~forming a closed circuit~~ in which refrigerant is enclosed and is circulated for the purpose of extracting, then rejecting, heat. ~~A direct refrigerating system is one in which the evaporator or condenser of the refrigerating system is in direct contact with the air or other substances to be cooled or heated. An indirect refrigerating system is one in which a secondary coolant cooled or heated by the refrigerating system is circulated to the air or other substance to be cooled or heated.~~

Reason: The proposal will better correlate the I-Codes with the industry standards, ASHRAE 15, for using the term refrigeration system rather than refrigerating systems. No technical change is intended.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change proposal will not increase or decrease the cost of construction. This proposal provides clarity and consistency for the use of this term throughout the I-codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Correlates the I-codes under one definition. (11-0)

Final Hearing Results

M10-21 Part II AS

M12-21

Original Proposal

IMC: TABLE 305.4

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

TABLE 305.4 PIPING SUPPORT SPACING[a]

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
ABS pipe	4	10[c]
Aluminum pipe and tubing	10	15
Cast-iron pipe[b]	5	15
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing	8	10
CPVC pipe or tubing, 1 inch and smaller	3	10[c]
CPVC pipe or tubing, 1 1/4-inches and larger	4	10[c]
Lead pipe	Continuous	4
~~PB pipe or tubing~~	~~2 2/3 (32 inches)~~	~~4~~
PE-RT 1 inch and smaller	2 2/3 (32 inches)	10[c]
PE-RT 1 1/4 inches and larger	4	10[c]
PEX tubing 1 inch and smaller	2 2/3 (32 inches)	10[c]
PEX tubing 1 1/4 inches and larger	4	10[c]
Polypropylene (PP) pipe or tubing, 1 inch and smaller	2 2/3 (32 inches)	10[c]
Polypropylene (PP) pipe or tubing, 1 1/4 inches and larger	4	10[c]
PVC pipe	4	10[c]
Steel pipe	12	15
Steel tubing	8	10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. See Section 301.18.

b. The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.

c. Mid-story guide.

Reason: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015. The referenced product standard, ASTM D3309 “Polybutylene (PB) Plastic Hot- and Cold-Water Distribution Systems” was withdrawn in 2010.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
PB pipe or tubing is no longer available and has already been removed from other sections of the IMC.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was approved As Submitted, as there is no need for Polybutylene (PB) tubing to be referenced in code. Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015. The referenced product standard, ASTM D3309 “Polybutylene (PB) Plastic Hot- and Cold-Water

Distribution Systems" was withdrawn in 2010.(Vote: 10-0 w/ 1 abstained)

Final Hearing Results

M12-21	AS

M13-21

Original Proposal

IMC: 306.5

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

2021 International Mechanical Code

Revise as follows:

306.5 Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge or landing platform not less than ~~30 inches (762 mm~~). 42 inches (1067 mm)
2. Ladders shall have rung spacing not less than 10 inches (254 mm) andnot to exceed 14 inches (356 mm) on center. The uppermost rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.
3. Ladders shall have a toe spacing not less than~~6 inches (152 mm)~~ 7 inches (178 mm) and not more than 12 inches (305 mm) deep
4. There shall be not less than~~18 inches (457 mm)~~ 7 inches (178 mm) and not more than 12 inches (305 mm)between rails.
5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.
8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.
9. Ladders shall be protected against corrosion by *approved* means.
10. Access to ladders shall be provided at all times.

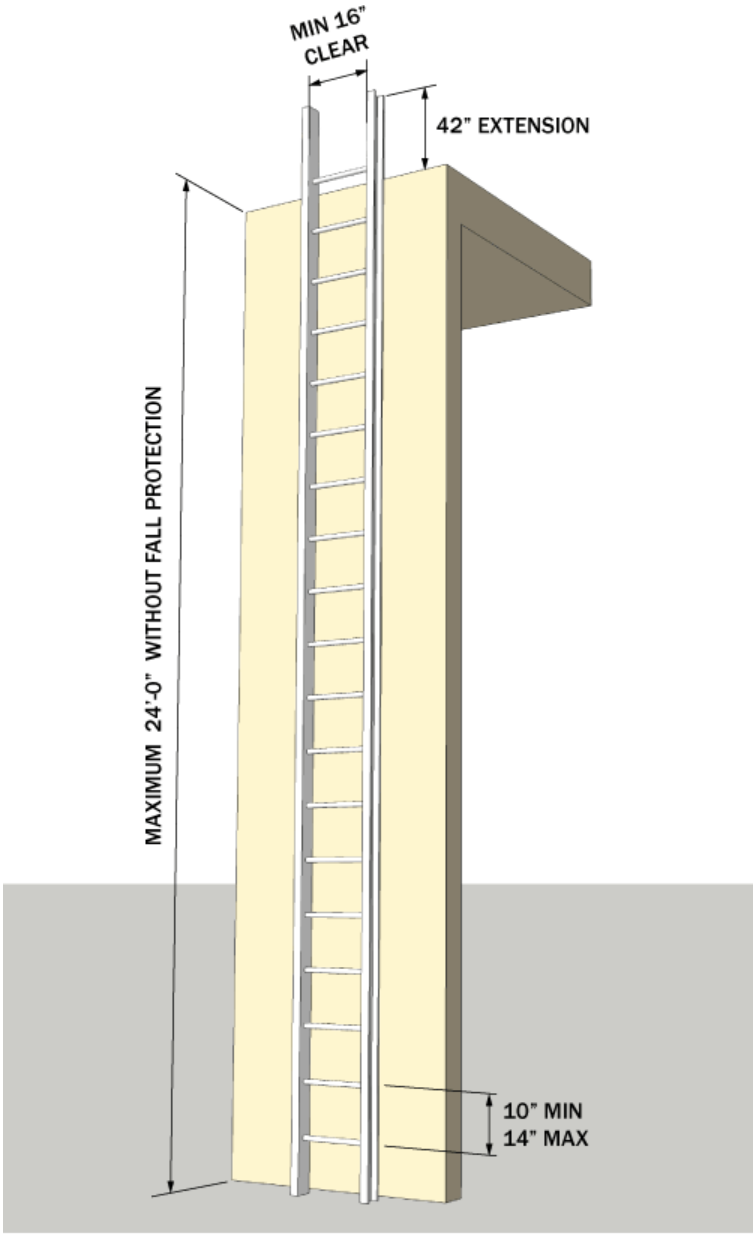
Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 *occupancies*.

Reason: · In 2018 OSHA revised its permanent ladder standards. Its time to revise the code to prevent confusion among designers and code officials as to what dimensions should be followed. Item #1 can be located in OSHA Standard Section 1910.23 (d) (7). Item 2 in Section 1910.27 (b) (1) (ii), Item 3 in Section1910.23 (12) (i). and item 4 in 1910.23 (b) (4).

· The American Ladder Institute estimates that about 500,000 ladder accidents happen each year in this country resulting in almost 300

deaths and 11 billion in medical costs. Its important for the code to keep up with the changing Standard in the name of safety.



Ladder Design Criteria - be sure to check the latest OSHA regulations

Cost Impact: The code change proposal will increase the cost of construction
There may be slight increases in cost as some of the dimensions have increased such as side rail height etc.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

306.5 Equipment and appliances on roofs or elevated structures.

Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a building such that personnel will have

to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge or landing platform not less than). 42 inches (1067 mm)
2. Ladders shall have rung spacing not less than 10 inches (254 mm) and not to exceed 14 inches (356 mm) on center. The uppermost rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.
3. Ladders shall have a toe spacing not less than 7 inches (178 mm) and not more than 12 inches (305 mm) deep
4. There shall be not less than ~~7 inches (178 mm) and not more than 12 inches (305 mm) between rails. 18 inches (547 mm)~~16 inches (406 mm) between rails.
5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.
8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.
9. Ladders shall be protected against corrosion by *approved* means.
10. Access to ladders shall be provided at all times.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 *occupancies*.

FLOOR MODIFICATION # 2607

Committee Reason: Aligning equipment access requirements with OSHA requirements is critical. The modification corrects a typographical error between 3 & 4. (Vote: 10-0 w/ 1 abstained)

Final Hearing Results

M13-21 AM

M14-21

Original Proposal

IMC: 306.5

Proponents: Guy McMann, Jefferson County Govt., Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us); Nancy Swearengin, Pikes Peak Regional Building Department, Self

2021 International Mechanical Code

Revise as follows:

306.5 Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center. The uppermost rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be not less than 18 inches (457 mm) between rails.
5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.
8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.
9. Ladders shall be protected against corrosion by *approved* means.
10. Access to ladders shall be provided at all times.
11. <u>Top landing required. The ladder shall be provided with a clear and unobstructed landing on the exit side of the roof hatch having a minimum space of 30 inches deep and be of the same width as the hatch.</u>

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 *occupancies*.

Reason: Safety for personnel is paramount. A person must have an area at the roof hatch opening that allows them to safely get onto and off of the roof.

- Without the proposed change the code official has nothing with which to enforce any requirement for a safe landing area for people attempting to access or exit the roof.

- The top of the permanent ladder is often 16 feet or more above the ground.
- Personnel should not be required to hang onto the top of a ladder, open the roof hatch and then try to figure out a safe way to step onto a roof.
- Balancing on the edge of the roof hatch opening is not an acceptable option for entry onto or exit off of a roof.
- Personnel should not find themselves staring into a parapet wall only inches from the roof hatch opening.
- Workers are often carrying supplies, wearing backpacks filled with tools or standing at the hatch using a rope to pull needed service items up to the roof. Not having a place to stand or set down tools, backpacks or repair parts at the top of the ladder creates a serious hazard.
- People are required to get on roofs in all types of weather including when it is raining and snowing. Roofs, especially rubber and metal ones, are slick and difficult to navigate when there is any type of moisture on them. Personnel deserve a safe area upon which to stand when getting onto or off of the roof.
- The ladder to the roof is often located in a dark area of the building. Upon opening the hatch personnel can momentarily be blinded by the sun and by reflections off of the roofing material. Not having a safe way to access the roof creates even more of a hazard.
- It is difficult to find the ladder rungs when coming through a roof hatch onto the fixed ladder. Not having a safe place to stand on the roof when attempting to find a ladder rung makes a difficult situation a dangerous one.

OSHA states that 20 percent of all fatal and lost workdays in general industry are due to falls from ladders. The American Ladder Institute estimates that about 500,000 ladder accidents occur annually in the United States resulting in almost 300 fatalities and $11 billion in injury costs.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There should be no additional cost associated with properly placing a roof hatch in a safe manner.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee approved this proposal as it does address a safety issue, however the committee also agreed the proposal should come back in the public comment process to address any conflicts with OSHA and to provide similar language in the IBC. (Vote: 6-5)

Final Hearing Results

M14-21 AS

M16-21

Original Proposal

IMC: 401.4, 501.3.1

Proponents: Mike Moore, Stator LLC, Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

401.4 Intake opening location. Air intake openings shall comply with all of the following:

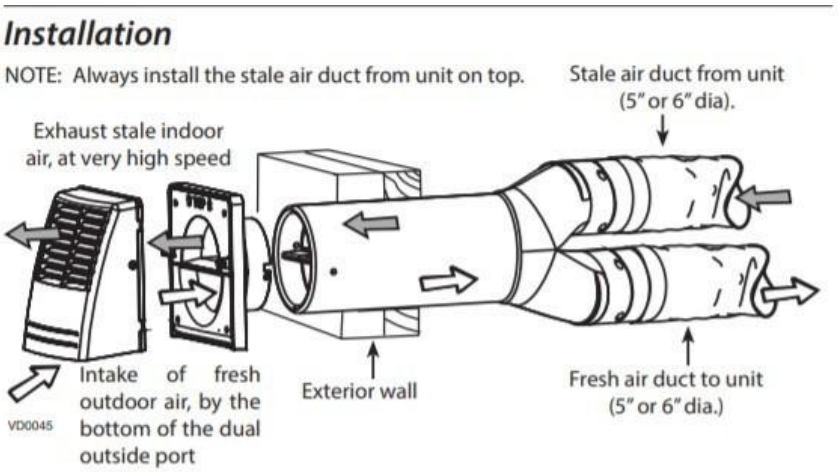
1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, 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. 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 *appliance* manufacturer's instructions.
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. 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 *appliance* manufacturer's instructions.
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: Factory-built intake/exhaust combination termination fittings are regularly provided by manufacturers and installed by builders to separate mechanical air intakes from mechanical exhaust serving dwelling unit or sleeping unit mechanical ventilation systems. The included image from a ventilation system manufacturer's installation instructions provides an example of a typical fitting serving this purpose.



IMC Sections 401.4 and 501.3.1 approve the use of "approved factory-built intake/exhaust combination termination fittings" to separate the air streams associated with mechanical intake air openings and living space exhaust air, when the fitting is provided in accordance with manufacturer's instructions. Similarly, Section G2407.1 of the Fuel Gas Code (see below for reference) approves the use of concentric vent termination fittings to separate combustion air from flue gases provided that such fittings are installed "in accordance with the appliance manufacturer's instructions". Like the Fuel Gas Code's treatment of concentric vent termination fittings, no special approval should be required for factory-built intake/exhaust combination termination fittings when installed in accordance with appliance manufacturer's instructions.

Fuel Gas Code reference: "G2407.1 (304.1) General ..... Direct-vent appliances, gas appliances of other than natural draft design, vented gas appliances not designated as Category I and appliances equipped with power burners, shall be provided with combustion, ventilation and dilution air in accordance with the appliance manufacturer's instructions."

Cost Impact: The code change proposal will decrease the cost of construction
Removing requirements for special approval of factory-built intake/exhaust combination termination fittings can be expected to reduce labor costs for builders, contractors, and code officials.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was approved as submitted based on the proponent reason statement. Factory-built intake/exhaust combination termination fittings are regularly provided by manufacturers and installed by builders to separate mechanical air intakes from mechanical exhaust serving dwelling unit or sleeping unit mechanical ventilation systems. Special approval should not be required for these types of fittings when installed in accordance with the manufacturer installation instructions. (Vote: 6-5)

Public Comments

Public Comment 1

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (pmgcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Mechanical Code

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

Commenter's Reason: The PMGCAC believes that use of the word "fan" instead of "appliance" will better clarify the intent of this proposal that factory-built intake/exhaust combination terminations are approved when recognized for use by the manufacturer of the connected ventilation fan.
In the case that a voter is not familiar with these terminations, which were first approved in the 2021 IMC, 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 by 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). These results are aligned with ASHRAE 62.2 approval of such devices, which limits cross-contamination to 10%, as verified by the manufacturer. Approval of this proposed modification is expected to result in an easier path to approval for these more affordable and architecturally flexible terminations.

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.

Cost Impact: The net effect of the Public Comment and code change proposal will decrease the cost of construction
This PC is aligned with the intent of the original proposal that was approved by the committee and can decrease the cost of construction for the same reasons provided in the original proposal.

Final Hearing Results

M16-21 AMPC1

M19-21

Original Proposal

IMC: 403.3.1, 403.3.2, 403.3.2.1

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

403.3.1 Other buildings intended to be occupied. The design of local exhaust systems and ventilation systems for outdoor air for *occupancies* other than Group R-2, R-3 and R-4 ~~three stories and less above grade plane~~ shall comply with Sections 403.3.1.1 through 403.3.1.4.

403.3.2 Group R-2, R-3 and R-4 occupancies~~, three stories and less~~. The design of local exhaust systems and ventilation systems for outdoor air in Group R-2, R-3 and R-4 *occupancies* ~~three stories and less in height above grade plane~~ shall comply with Sections 403.3.2.1 through 403.3.2.5.

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.

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

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

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 airflow 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 percent 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.

Reason: Prior to 2015, the IMC used the same mechanical ventilation outdoor airflow rate calculation procedure for all R-2, R-3, and R-4 dwelling units. Beginning in 2015, a new calculation procedure was introduced in the IMC for low-rise R-2, R-3, and R-4 dwelling units. This 2015 calculation procedure was based on the airflow equation used in ASHRAE 62.2-2010, which was developed for leaky, detached,

single-family homes (bad assumption!). Applying this ventilation equation and associated assumptions to tight, attached, low-rise R-2, R-3, and R-4 dwelling units results in extremely low flow rates that are a fraction of what was previously required by the IMC (1/3 less), what is currently required by ASHRAE 62.2 (1/3 less), and what is currently required by ASHRAE 62.1 (1/2 less).
Since 2015, ASHRAE 62.2 has revised its airflow rate calculation procedure for attached dwelling units, based on infiltration assumptions that are relevant to attached dwelling units, and the result is much closer to that required by required by the 2012 IMC for all private dwelling units and by the 2021 IMC for all private dwelling units that are not in low-rise R-2, R-3, and R-4 buildings. The rate required for IMC low-rise R-2, R-3, and R-4 dwelling units should also be revised to avoid under-ventilation that can lead to poor IAQ and negative health outcomes. Avoiding under-ventilating is especially important for IAQ in high-density multifamily dwelling units.

Following are calculations showing the outdoor airflow rate (QOA) required by various methods and demonstrating the deficiency of the ventilation rates for IMC low-rise R-2, R-3, and R-4 dwelling units. The rate calculated is for a 2-bedroom, 800 ft2 apartment with 8 ft ceilings (volume = 6400 ft3)

Method A: 2015-2021 IMC, dwelling units in low-rise R-2, R-3, and R-4 buildings (same equation used in ASHRAE 62.2-2010):

QOA = 0.01 cfm/ft2*ConditionedFloorArea + 7.5*(NumberBedrooms + 1)

= 0.01*800 + 7.5*(2+1)

= 8 + 22.5

= 30.5 cfm [This rate is 1/3 less than the 2012 IMC, 1/3 less than ASHRAE 62.2-2019, and ½ less than ASHRAE 62.1-2019]

Method B: 2012 IMC, all private dwelling units (same equation used in 2021 IMC for all private dwelling units that are not in low-rise R-2, R-3, and R-4 buildings):

QOA = Max [0.35 ACH, (15 cfm/person)*(2 persons for first bedroom and 1 person for second bedroom)]

= Max [0.35ACH*(6400 ft3)*(1-hr/60-min), 45]

= Max [37, 45]

= 45 cfm

Method C: ASHRAE 62.2-2019, all non-transient vertically attached dwelling units

QOA = 0.03 cfm/ft2*ConditionedFloorArea + 7.5*(NumberBedrooms + 1)

= 0.03*800 + 7.5*(2+1)

= 24 + 22.5

= 46.5 cfm [This method is proposed within this proposal. Note that this method produces values that are very close to those in Method B (i.e., the 2012 IMC for all private dwelling units and the 2021 IMC for all private dwelling units that are not in low-rise R-2, R-3, and R-4 buildings]

Method D: ASHRAE 62.1-2019, all transient dwelling units:

QOA = 0.06 cfm/ft2*ConditionedFloorArea + (5 cfm/person)*(2 persons for first bedroom and 1 person for second bedroom)

= 0.06*800 + 5*3

= 0.06*800 + 5*3

= 48 + 15

= 63 cfm

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website

at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 38.

Cost Impact: The code change proposal will increase the cost of construction

An increase in required ventilation rate could, in some situations, require a “step up” to the next size of ventilation equipment or a “step up” to the next duct size in some parts of systems. Generally, next size “step-ups” will have some increased material costs but this would not always be the case for every project.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

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}= ~~0.01~~ 0.03 A_{floor} +7.5(N_{br}+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 airflow 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 percent 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.

Committee Reason: The proposal has passed as modified as the language is trying to align with ASHRAE 62.2 to avoid underventilation of spaces. (Vote: 7-4)

Final Hearing Results

M19-21 AM

M20-21

Original Proposal

IMC: TABLE 403.3.1.1

Proponents: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., Adult Changing Table Committee (JBEngineer@aol.com)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1 MINIMUM VENTILATION RATES

Portions of table not shown remain unchanged.

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]
Public spaces				
Corridors	—	—	0.06	—
Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1.0
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]	—	—	—	50/20 [f]
Smoking lounges [b]	70	60	—	—
Toilet rooms — public [g]	—	—	—	50/70 [e]
Room with adult changing station			[d]	50/70 [e]

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 • 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 or adult changing station. 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 . 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: This change is being submitted by the Adult Changing Table Committee of ICC A117.1. There are proposals to the Building Code and Plumbing Code related to the adult changing stations. The Committee believed that the ventilation requirements in the Mechanical Code needed to address the additional ventilation for an adult changing station. Since the station involves the changing of adult diapers, it was believed that the ventilation should mirror the requirements for a public toilet room. The proposed change is consistent with the ventilation required for each water closet and urinal. It adds "adult changing station" as the third item for determining the ventilation rate.

Cost Impact: The code change proposal will increase the cost of construction
This change will mandate a level of ventilation of a rooms having an adult changing station. The net increase in ventilation will add cost to construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal provides ventilation levels for adult change tables that are appropriate. (Vote: 11-0)

Final Hearing Results

M20-21 AS

M21-21

Original Proposal

IMC: TABLE 403.3.1.1

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

2021 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]
Animal Facilities				
Animal exam room (veterinary office)	20	10	0.12	-
Animal imaging (MRI/CT/PET)	20	10	0.18	0.9
Animal operating rooms	20	10	0.18	3.00
Animal postoperative recovery room	20	10	0.18	1.50
Animal preparation rooms	20	10	0.18	1.50
Animal procedure room	20	10	0.18	2.25
Animal surgery scrub	20	10	0.18	1.50
Large-animal holding room	20	10	0.18	2.25
Necropsy	20	10	0.18	2.25
Small-animal cage room (static cages)	20	10	0.18	2.25
Small-animal-cage room (ventilated cages)	20	10	0.18	1.50
Correctional facilities				
Booking/waiting	50	7.5	0.06	—
Cells without plumbing fixtures with plumbing fixtures [g]	25 25	5 5	0.12 0.12	— 1.0
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	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	1.0
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	—
Break rooms	25	5	0.06	-
Cafeteria, fast food	100	7.5	0.18	—
Coffee stations	20	5	0.06	-
Corridors	-	-	0.06	-
Dining rooms	70	7.5	0.18	—

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *R* CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *R* CFM/FT	EXHAUST AIRFLOW RATE CFM/FT
Kitchens (cooking) [b]	20	7.5	0.12	0.7
Occupiable storage rooms for liquids or gels	2	5	0.12	-
Hotels, motels, resorts and dormitories				
Bathrooms/toilet—private [g]	—	—	—	25/50 [f]
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	—
Laundry rooms, central	10	5	0.12	-
Laundry rooms within dwelling units	10	5	0.12	-
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	5	0.06	—
Offices				
Break rooms	50	5	0.12	-
Conference rooms	50	5	0.06	—
Main entry lobbies	10	5	0.06	—
Occupiable storage rooms for dry materials	2	5	0.06	-
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Outpatient healthcare facilities [i, j]				
Birthing room	15	10	0.18	-
Class 1 imaging room	5	5	0.12	-
Dental operatory [k]	20	10	0.18	-
General examination room	20	7.5	0.12	-
Other dental treatment areas	5	5	0.06	-
Physical therapy exercise area	7	20	0.18	-
Physical therapy individual room	20	10	0.06	-
Physical therapeutic pool area	-	-	0.48	-
Prosthetics and orthotics room	20	10	0.18	-
Psychiatric consultation room	20	5	0.06	-
Psychiatric examination room	20	5	0.06	-
Psychiatric group room	50	5	0.06	-
Psychiatric seclusion room	5	10	0.06	-
Speech therapy room	20	5	0.06	-
Urgent care examination room	20	7.5	0.12	-
Urgent care observation room	20	5	0.06	-
Urgent care treatment room	20	7.5	0.18	-
Urgent care triage room	20	10	0.18	-
Private dwellings, single and multiple				
Garages, common for multiple units [b]	—	—	—	0.75
Kitchens [b]	—	—	—	50 /100 [f]
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]	—	—	—	25 /50 [f]
Public spaces				
Corridors	—	—	0.06	—
Courtrooms	70	5	0.06	—
Elevator car	—	—	—	1.0
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]	—	—	—	50/20 [f]
Smoking lounges [b]	70	60	—	—
Toilet rooms — public [g]	—	—	—	50/70 [e]
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
Banks or lobbies	15	7.5	0.06	-
Barber	25	7.5	0.06	0.5
Beauty salons [b]	25	20	0.12	0.6

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *R* CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *R* CFM/FT	EXHAUST AIRFLOW RATE CFM/FT
Embalming room[b]	—	—	—	2.0
Nail salons [b , n]	25	20	0.12	0.6
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	—	—	0.30	0.5
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Storage				
Refrigerated warehouses/freezers (<50°F)	—	10	—	0.75
Repair garages, enclosed parking garages[b, d]	—	—	—	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	—	—	—	1.0
Manufacturing where hazardous materials are not used	7	10	0.18	-
Manufacturing where hazarous materials are used (excludes heavy industrial and chemical processes)	7	10	0.18	-
Meat processing [c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Sorting, packing, light assembly	7	7.5	0.12	-
Telephone closets	-	-	0.00	-

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 . 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.

i. Outpatient facilities to which the rates apply are freestanding birth centers, urgent care centers, neighborhood clinics and physicians' offices, Class 1 imaging facilities, outpatient psychiatric facilities, outpatient rehabilitation facilities, and outpatient dental facilities.

j. The requirements of this table provide for acceptable IAQ. The requirements of this table do not address the airborne transmission or airborne viruses, bacteria, and other infectious contagions.

k. These rates are intended only for outpatient dental clinics where the amount of nitrous oxide is limited. They are not intended for dental operatories in institutional buildings where nitrous oxide is piped.

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 62.1-2019.

Bibliography: ASHRAE Standard 62.1-2019, Ventilation for Acceptable Indoor Air Quality

Cost Impact: The code change proposal will decrease the cost of construction
This proposal revises ventilation rates for specific spaces within varying occupancy classifications. However, this does not dictate system design to meet those requirements and therefore does not increase the cost of construction.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

407.1 General.

Mechanical ventilation for ambulatory care facilities and Group I-2*occupancies* shall be designed and installed in accordance with this code, ASHRAE/ASHE 170 and NFPA 99.

CHAPTER15REFERENCED STANDARDS

Revise as follows:

ASHRAE ASHRAE/ASHE	ASHRAE1791 Tullie Circle NE Atlanta, GA 30329

~~170—2017~~ 170-2021	Ventilation of Health Care Facilities

Committee Reason: This proposal appropriately updates 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 62.1-2019. The modification updates the edition year of the ASHRAE/ ASHE 170-2021 Standard. (Vote: 11-0)

Final Hearing Results

M22-21

Original Proposal

IMC: TABLE 403.3.1.1

Proponents: Andrew Klein, Self Storage Association (andrew@asklein.com)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.1.1 MINIMUM VENTILATION RATES

Portions of table not shown remain unchanged.

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]
Storage				
Refrigerated warehouses/freezers	—	10	—	0.75
Repair garages, enclosed parking garages[b, d]	—	—	—	0.75
Warehouses[l]	—	10	0.06	—

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 • 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 . 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.

i. <u>The occupiable floor area in warehouses shall not include the floor area of self-storage units, floor areas under rack storage, or designated palletized storage floor areas.</u>

Reason: This proposal clarifies the application of Section 403.3.1.1, regarding required minimum outdoor airflow rates, in storage occupancies. The current code language is inconsistently applied when there are fixed storage areas that do not change without a permit. Examples of such floor areas may include those dedicated to high-piled rack storage, self-storage facility units that are not fully partitioned

off from interior corridors, and other floor areas that are designated solely for storage.
Ignoring the volume taken up by storage and the thermal mass it provides in helping with temperature regulation results in the oversizing of HVAC equipment, increasing energy use and limiting the effectiveness of humidity control that properly-sized systems provide. By adding this footnote, the minimum outdoor airflow rates for occupiable space in storage occupancies can be properly calculated and consistently enforced.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is simply a clarificatoin of how occupiable floor area in storage occupancies is to be calculated. This code change proposal will decrease the cost of construction from when the occupiable floor area in warehouses was incorrectly calculated, due to smaller mechanical system requirements.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee agreed that this was a reasonable approach based upon the proponent reason statement. This proposal clarifies the application of Section 403.3.1.1, regarding required minimum outdoor airflow rates, in storage occupancies. The current code language is inconsistently applied when there are fixed storage areas that do not change without a permit. Examples of such floor areas may include those dedicated to high-piled rack storage, self-storage facility units that are not fully partitioned off from interior corridors, and other floor areas that are designated solely for storage.(Vote: 8-3)

Final Hearing Results

M22-21 AS

M23-21

Original Proposal

IMC: SECTION 202, 403.3.2.1

Proponents: Mike Moore, Stator LLC, Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

BALANCED VENTILATION SYSTEM

.

~~Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10 percent of the total mechanical supply airflow rate.~~ A ventilation system where the total mechanical supply airflow and total mechanical exhaust airflow are simultaneously within 10 percent of their average. The balanced ventilation system airflow is the average of the mechanical supply and mechanical exhaust airflows.

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.

$$Q_{OA} = 0.01 A_{floor} + 7.5(N_{br} + 1)$$ **(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 airflow 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 percent 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~~ *system*.

Reason: The 2021 versions of the IMC and IRC introduced a 30% ventilation rate credit for dwelling units with systems providing balanced ventilation. Because these changes were based on the approval of multiple proposals, their approval resulted in different definitions for *balanced ventilation* and *balanced ventilation system* across the IRC and IMC. This proposal and its companion proposal to the IRC are

correlation proposals that will align the terminology, definitions, and their application across both codes. The change that is proposed in Section 403.3.2.1 is italicizing the word "system" within the phrase "*balanced ventilation system*" so that the user is directed to the corresponding definition.

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

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: The proposal is poorly worded using words such as "average". It is not clearly defined text and is confusing, implying that air force rate should be within 10% of their average. (Vote: 11-0)

Public Comments

Public Comment 1

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (pmgcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Mechanical Code

BALANCED VENTILATION SYSTEM.
~~A ventilation system where the total mechanical supply airflow and total mechanical exhaust airflow are simultaneously within 10 percent of their average. The balanced ventilation system airflow is the average of the mechanical supply and mechanical exhaust airflows.~~

A ventilation system that simultaneously supplies outdoor air to and exhausts air from a space, where the mechanical supply airflow rate and the mechanical exhaust airflow rate are each within 10% of the average of the two airflow rates.

Commenter's Reason: The PMGCAC worked with the proponent to revise the language in response to the IMC Committee's comments. All parties agree that this definition better clarifies the meaning of the current term. The PMGCAC and the proponent are submitting a coordinating public comment to revise the IRC definition under RM16.

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction
This change is a non-substantive clarification of an existing definition.

Final Hearing Results

M23-21 AMPC1

M24-21

Original Proposal

IMC: TABLE 403.3.2.3

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

TABLE 403.3.2.3 MINIMUM REQUIRED LOCAL EXHAUST RATES FOR GROUP R-2, R-3 AND R-4 OCCUPANCIES

AREA TO BE EXHAUSTED	EXHAUST RATE CAPACITY
Kitchens	100 cfm intermittent or ~~25~~ 50 cfm continuous
Bathrooms and toilet rooms	50 cfm intermittent or ~~20~~ 25 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m^3/s.

Reason: Consistency with IMC Table 403.3.1.1 (which is consistent with ASHRAE 62.1)
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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 39.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Builders specifying exhaust equipment that is sized to meet the intermittent rate requirement will see no increase in the cost of construction. Builders specifying in-suite exhaust equipment that is sized to meet the continuous rate should also see no increase in the cost of exhaust fans, which typically have a nominal rated flow of at least 50 cfm. Builders electing to use central exhaust equipment serving multiple dwelling units and using the continuous rate may see an increase in the cost of equipment; however, such equipment is often provisioned with high speed settings that can achieve flow rates that are 2-3x that provided by the low speed setting. So, there are multiple paths to implement this code change proposal without increasing the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Proposal correctly aligns Tables 403.3.1.1 with Table 403.3.2.3. (Vote: 11-0)

Final Hearing Results

M25-21

Original Proposal

IMC: SECTION 403, 403.4 (New), 403.4.1 (New), 403.4.2 (New)

Proponents: Mark Lessans, Johnson Controls, Johnson Controls (mark.lessans@jci.com)

2021 International Mechanical Code

SECTION 403
MECHANICAL VENTILATION

Add new text as follows:

403.4 Clean Air Delivery Capability. Each mechanical system shall meet the requirements in 403.4.1. Each occupiable space shall meet the requirements in 403.4.2.

Exception: Occupiable spaces where 100% of the supply air meets High-efficiency Particulate Air filtration.

403.4.1 Airflow for Increased Filtration. Mechanical systems shall be sized to accommodate a design airflow at a total static pressure drop which assumes the utilization of a supply air filter with a Minimum Efficiency Reporting Value of no less than 13.

403.4.2 Zonal Filtration or Disinfection Capability. Each occupiable space shall have 120-volt receptacles which provide at least 0.2 watts per square foot of occupiable space above the requirements of the National Electrical Code to support supplemental air cleaning devices.

Exception: Rooms with less than 500 square feet of occupiable space.

Reason: This proposal seeks to “ready” buildings for retrofits and other changes if indoor clean air delivery needs to be increased – such as in response to mitigating an airborne contaminant – per ASHRAE and CDC guidance on reopening buildings during the COVID-19 pandemic. If the mechanical system is not designed with a MERV 13 filter, it would at least be sized to accommodate the use of one later on without having to redesign or replace the system. This is important, as MERV 13 filters are often at the balance point between filtration effectiveness and energy efficiency. However, these filters are thicker and have a larger airflow resistance when compared to conventional filters, and often existing systems cannot accommodate them. This proposal also requires that occupiable spaces be equipped with the electrical infrastructure needed to increase clean air delivery at the zonal level, such as using a HEPA room air cleaning machine.

Cost Impact: The code change proposal will increase the cost of construction
These additional requirements will result in a modest increase in construction costs, but this cost pales in comparison to the burden of adding them post-construction.

Public Hearing Results

Committee Action **As Modified**

Committee Modification: APPENDIX DClean Air Delivery
~~403.4~~ D101 Clean Air Delivery Capability.

Each mechanical system shall meet the requirements in ~~403.4.1~~Section D101.1. Each occupiable space shall meet the requirements in

~~403.4.2~~Section D101.2.

Exceptions:

1. Group R occupancies.
2. Occupiable spaces where 100% of the supply air meets High-efficiency Particulate Air filtration.
3. Rooms with less than 500 square feet of occupiable space.

~~403.4101.1~~ D101.1 Airflow for Increased Filtration.

Mechanical systems shall be sized to accommodate a design airflow at a total static pressure drop which assumes the utilization of a supply air filter with a Minimum Efficiency Reporting Value of no less than 13.

~~403.4.2~~ D101.2 Zonal Filtration or Disinfection Capability.

Each occupiable space greater than 500 square feet shall have at least one 125-volt, single-phase, 15- or 20-ampere receptacle outlet installed in an accessible location for the cord-and-plug connection of a supplemental air cleaning appliance. One additional receptacle outlet shall be installed for each additional 1000 square feet of occupiable space. The installation shall comply with NFPA 70. ~~shall have 120-volt receptacles which provide at least 0.2 watts per square foot of occupiable space above the requirements of the National Electrical Code to support supplemental air cleaning devices.~~ which provide at least 0.2 watts per square foot of occupiable space above the requirements of the National Electrical Code to support supplemental air cleaning devices.

Committee Reason: The committee has appropriately agreed that current code language must be clarified between residential and commercial in the appendix, Exempt Group 8 and electrical equipment. This proposal also requires that occupiable spaces be equipped with the electrical infrastructure needed to increase clean air delivery at the zonal level. The modifications further clarify acceptable industry practices and gives opportunities for jurisdictions. (Vote: 6-5)

Public Comments

Public Comment 1

Proponents: John Catlett, J.D. Catlett Consulting, LLC, BOMA International (catlettcodeconsulting@gmail.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

D101 Clean Air Delivery Capability . Each mechanical system shall meet the requirements in D101.1. ~~Each occupiable space shall meet the requirements in D101.2.~~

Exceptions:

1. Group R occupancies.
2. Occupiable spaces where 100% of the supply air meets High-efficiency Particulate Air filtration.

~~**D101.2 Zonal Filtration or Disinfection Capability .** Each occupiable space greater than 500 square feet shall have at least one 125-volt, single-phase, 15- or 20-ampere receptacle outlet installed in an accessible location for the cord-and-plug connection of a supplemental air cleaning appliance. One additional receptacle outlet shall be installed for each additional 1000 square feet of occupiable space. The installation shall comply with NFPA 70.~~

Commenter's Reason: BOMA supported the proposal as originally written as long as it was an appendix item. It provides good guidance to building owners who may choose to prepare for future pandemic needs or could be adopted locally by choice.
BOMA is deeply involved with the ICC Pandemic Task Force. It has been made clear that not all diseases that could potentially rise to

pandemic status can be treated the same. So the proposal provides an option to consider for new or altered buildings.

However, a floor modification was added at the last minute that added the proposed deleted language.

The additional electrical outlet is not needed. Period. If it were, it should be added to the NEC, not the mechanical code.

The consumption associated with individual room air filtration systems is no more than normal cord and plug connected appliances that are already covered under the general load calculation found in the NEC. No evidence was provided to support the need. Portable heaters, small desk refrigerators, fans and similar devices do not require additional load calculation as they are assumed in the general calculation. The only benefit of the proposal is to the electrical manufacturing, suppliers, and installers.

The cost/benefit is just not there. We ask that the proposal be modified to remove the electrical outlets and additional calculation.

Cost Impact: The net effect of the Public Comment and code change proposal will decrease the cost of construction
This public comment will decrease the cost of compliance. The additional electrical outlet will serve no purpose other than a cost increase. Should there be a consideration of the actual need for the dedicated outlets, this should be considered by the appropriate NFPA 70 committee and not the ICC Mechanical Code Committee.

Public Comment 2

Proponents: Jeffrey Shapiro, International Code Consultants, IIAR (jeff.shapiro@intlcodeconsultants.com) requests As Modified by Public Comment

Further modify as follows:

2021 International Mechanical Code

D101 Clean Air Delivery Capability. ~~Each~~ In Groups A, B, E and I occupancies,each mechanical system shall meet the requirements in D101.1. Each occupiable space in such occupancies shall meet the requirements in D101.2.

~~Exceptions~~Exception:

~~1. Group R occupancies.~~

~~2.~~ Occupiable spaces where 100% of the supply air meets High-efficiency Particulate Air filtration.

Commenter's Reason: The proposed requirements are an over-reach for factory, storage, high-hazard, industrial, mercantile, and utility occupancies and should not apply in any case, even though they are already relegated to an optional appendix. Residential occupancies were already exempted, so this public comment just retained that exemption.

Cost Impact: The net effect of the Public Comment and code change proposal will decrease the cost of construction
Reducing the scope of application for this appendix will result in cost savings for occupancies that are not included.

Final Hearing Results
M25-21 AMPC1,2

M26-21

Original Proposal

IMC: 405.2 (New), 405.2.1 (New), 405.2.2 (New), 405.2.3 (New), 405.2.3.1 (New)

Proponents: Mark Lessans, Johnson Controls, Johnson Controls (mark.lessans@jci.com)

International Mechanical Code

2021 International Mechanical Code

Add new text as follows:

405.2 Demand Control Ventilation. Each occupiable space shall be equipped with a carbon dioxide sensor which meets the requirements in 405.2.1 and 405.2.3. Mechanical equipment serving each zone(s) shall be equipped with controls which meet the requirements in 405.2.2.

405.2.1 Carbon Dioxide Sensor Performance Specifications. Each carbon dioxide sensor installed in accordance with Section 405.2 shall meet the following carbon dioxide measurement specifications as certified by the equipment manufacturer:

1. Range lower bound less than or equal to 400 parts per million
2. Range upper bound greater than or equal to 2,000 parts per million
3. Accuracy within ±75 parts per million at a reading of 1,000 parts per million
4. Output resolution less than or equal to 5 parts per million

405.2.2 Mechanical System Controls. Controls installed in accordance with Section 405.2 shall:

1. Receive data from the carbon dioxide sensor in the occupiable zone(s) at least once per 5 minutes
2. Be calibrated to provide pre-established outdoor airflow rates, or be equipped with the necessary instrumentation to measure outdoor airflow
3. Be capable of adjusting the outdoor airflow in response to an adjustable outdoor airflow setpoint
4. Increase the amount of outdoor air provided to each occupiable zone until the carbon dioxide level in each occupiable zone falls below a maximum threshold as defined by the user

405.2.3 Ventilation Rate Alarming. When carbon dioxide levels are above a maximum level as defined by the user, sensors installed in accordance with Section 405.2 shall alert the occupants with a visual and audible indication in the zone or through a building monitoring system.

405.2.3.1 Default Carbon Dioxide Threshold Level. The threshold level for carbon dioxide measurement above which triggers an alert in accordance with Section 405.2.3 shall be set to 1,100 parts per million by default.

Reason: Several recently published studies[1,2] have demonstrated that a large portion of indoor occupied spaces to not meet minimum requirements for ventilation as set in ASHRAE Standard 62.1, and have documented the impacts on occupant health, comfort, and productivity. Additionally, providing adequate ventilation is the most effective first step in mitigating the transmission of viruses carried by airborne particulates, an issue that has been highlighted during the COVID-19 pandemic.

This proposal seeks to ensure building occupants have access to adequate ventilation by bringing Demand Control Ventilation (DCV) to each occupiable zone and managing carbon dioxide levels – the best proxy we have for determining inadequate ventilation and/or above-

normal occupancy. The proposal requires that every occupiable zone have a basic CO2 sensor, that the CO2 sensor communicate with the building mechanical system, and that the mechanical system be capable of adjusting airflow rates to keep CO2 levels (and therefore ventilation adequacy) within acceptable levels. It also requires that the CO2 sensor notify either the occupants, or the building manager, when ventilation is inadequate. This can be especially helpful first step in helping building occupants understand when indoor may be at unhealthy levels and take mitigating action.

If successfully deployed, this proposal would go a long way toward maintaining adequate ventilation, as well as assist in saving energy by preventing overventilation of spaces.

Bibliography: [1]University of California at Davis, Ventilation rates in California classrooms: Why many recent HVAC retrofits are not delivering sufficient ventilation, January 2020
[2]United States Government Accountability Office, School Districts Frequently Identified Multiple Building Systems Needing Updates or Replacement, June 2020

Cost Impact: The code change proposal will increase the cost of construction
This proposal will increase the cost of construction as additional sensors will be required.

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: The proponent references studies tied to school facilities only. Providing demand control ventilation to each occupiable space is too broad. (Vote: 11-0)

Public Comments

Public Comment 1

Proponents: Mark Lessans, Johnson Controls, Johnson Controls (mark.lessans@jci.com) requests As Modified by Public Comment

Modify as follows:

2021 International Mechanical Code

~~**405.2 Demand Control Ventilation.** Each occupiable space shall be equipped with a carbon dioxide sensor which meets the requirements in 405.2.1 and 405.2.3. Mechanical equipment serving each zone(s) shall be equipped with controls which meet the requirements in 405.2.2.~~

~~**405.2.1 Carbon Dioxide Sensor Performance Specifications.** Each carbon dioxide sensor installed in accordance with Section 405.2 shall meet the following carbon dioxide measurement specifications as certified by the equipment manufacturer:~~

1. ~~Range lower bound less than or equal to 400 parts per million~~
2. ~~Range upper bound greater than or equal to 2,000 parts per million~~
3. ~~Accuracy within ±75 parts per million at a reading of 1,000 parts per million~~
4. ~~Output resolution less than or equal to 5 parts per million~~

~~**405.2.2 Mechanical System Controls.** Controls installed in accordance with Section 405.2 shall~~:

1. ~~Receive data from the carbon dioxide sensor in the occupiable zone(s) at least once per 5 minutes~~

2. ~~Be calibrated to provide pre-established outdoor airflow rates, or be equipped with the necessary instrumentation to measure outdoor airflow~~
3. ~~Be capable of adjusting the outdoor airflow in response to an adjustable outdoor airflow setpoint~~
4. ~~Increase the amount of outdoor air provided to each occupiable zone until the carbon dioxide level in each occupiable zone falls below a maximum threshold as defined by the user~~

~~**405.2.3 Ventilation Rate Alarming.** When carbon dioxide levels are above a maximum level as defined by the user, sensors installed in accordance with Section 405.2 shall alert the occupants with a visual and audible indication in the zone or through a building monitoring system.~~

~~**405.2.3.1 Default Carbon Dioxide Threshold Level.** The threshold level for carbon dioxide measurement above which triggers an alert in accordance with Section 405.2.3 shall be set to 1,100 parts per million by default.~~

Appendix D Clean Air Delivery

User Note . *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.*
About this appendix: *Appendix D provides criteria for an increased protection level for occupant health by delivering and monitoring clean air in occupied areas of the certain buildings.*

D101 Demand control ventilation . Group A, B, E and I occupancies shall be equipped with a minimum of one carbon dioxide sensor for every 500 square feet of occupiable space. Carbon dioxide sensors installed in accordance with this section shall meet the requirements in Sections D101.1 and D101.3. Mechanical equipment serving each zone(s) shall be equipped with controls which meet the requirements in Section D101.2.

Exception: Occupiable zones less than 500 square feet.

D101.1 Carbon dioxide sensor performance specifications . Each carbon dioxide sensor installed in accordance with Section D101 shall meet the following carbon dioxide measurement specifications as certified by the equipment manufacturer:

1. Range lower bound less than or equal to 400 parts per million
2. Range upper bound greater than or equal to 2,000 parts per million
3. Accuracy within ±75 parts per million at a reading of 1,000 parts per million
4. Output resolution less than or equal to 20 parts per million

D101.2 Mechanical system controls . Controls for the mechanical equipment installed in accordance with Section D101 shall:

1. Receive data from the carbon dioxide sensor in the occupiable zone(s) at least once per 5 minutes
2. Be calibrated to provide pre-established outdoor airflow rates, or be equipped with the necessary instrumentation to measure the outdoor airflow rate
3. Be capable of adjusting the outdoor airflow rate in response to an adjustable outdoor airflow setpoint
4. Increase the amount of outdoor air provided to each occupiable zone until the carbon dioxide level in each occupiable zone falls below a maximum threshold as defined by the user

D101.3 Carbon dioxide detection threshold level . The default detection threshold level for carbon dioxide measurement above which triggers an alert in accordance with Section D101.4 shall be set to 1,100 parts per million. The end user can modify the detection threshold level based on specific operations and needs.

D101.4 Carbon dioxide detection threshold level exceeded . When carbon dioxide levels exceed the detection threshold level established in Section D101.3, the mechanical equipment shall modify the outdoor airflow rate as required in Section D101.2. When the carbon dioxide concentration remains above the detection threshold level for a period of 30 minutes or more, the occupants in the zone shall be alerted by approved audible and visual notification devices or through a building monitoring system.

Commenter's Reason: The code development committee disapproved this proposal because it was too broad in its application. This Public Comment contains revisions to address the committee's concerns in addition to clarifications.
First, the committee agreed with moving this proposal to a new Appendix D. Appendix D is created along with renumbering of sections as appropriate. The standard appendix note is added indicating that as an appendix chapter, these provisions will only apply when specifically referenced in the adopted ordinance.

Second, this Public Comment limits application of these requirements. The requirements are only applicable to Groups A, B, E and I occupancies. These occupancies fall into similar characteristics for level of hazard and occupant density. Industrial type facilities such as Groups F, H and S are not included. Additionally, the exception eliminates the requirements for occupiable spaces where the air handling zone is less than 500 square feet.

Third, a revision is added to limit the number of carbon dioxide sensing devices to one per 500 square feet. This eliminates the need for a device in every room or space.

Fourth, clarification is added in Section D101.4 as far the actions required when excess levels of carbon dioxide are detected.

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction
This Public Comment moves the code change proposal into an Appendix, thus making the requirements not mandatory, and not increasing or decreasing the cost of construction.

Final Hearing Results

M26-21 AMPC1

M28-21

Original Proposal

IMC: 501.3.1

Proponents: Brent Ursenbach, West Coast Code Consultants, Inc, Utah Governor's Office of Energy Development (brentu@wc-3.com)

2021 International Mechanical Code

Revise as follows:

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, except where the exhaust opening is located not less than 1 foot (305 mm) above the gravity air intake opening into buildings for all *occupancies* other than Group U; and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.
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: With the increased popularity of multi-family units, many times with limited wall areas on the front and back of these dwellings, quite often it's difficult to find sufficient wall area to locate terminations compliant with the exhaust opening 3' clearance requirements in this section. The exhaust from dryers, bath fans and domestic ranges is not considered noxious or hazardous, and poses little if any health risk. Taking into account the buoyancy of the exhaust air, the chance of the exhaust air migrating down into an opening is minimal to none. Imagine the simplification of the exhaust duct installation if terminations were allowed above windows with this 1' clearance requirement.

In IFGC 503.8 clearance requirements for direct vent gas appliance from these openings are in many cases less than these requirements for these environment exhausts. In fact the requirement for a through the wall direct vent termination < 10,000 Btu/hr. is 6" in any direction. These gas vents exhaust hazardous productions of combustion to outside, not *environment air.*

Meeting the current requirements often adds extra elbows and pipe to the exhaust duct system, reducing the airflow through the duct. This is a wasted expense of no value.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal reduces materials and labor expense required to offset exhaust duct terminations away from windows.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed As Submitted based on the proponent reason statement. With the increased popularity of multi-family units, many times with limited wall areas on the front and back of these dwellings, quite often it's difficult to find sufficient wall area to locate terminations compliant with the exhaust opening 3' clearance requirements in this section. The exhaust from dryers, bath fans and domestic ranges is not considered noxious or hazardous, and poses little if any health risk. Taking into account the buoyancy of the exhaust air, the chance of the exhaust air migrating down into an opening is minimal to none.
Imagine the simplification of the exhaust duct installation if terminations were allowed above windows with this 1' clearance requirement.

In IFGC 503.8 clearance requirements for direct vent gas appliance from these openings are in many cases less than these requirements for these environment exhausts. In fact the requirement for a through the wall direct vent termination < 10,000 Btu/hr. is 6" in any direction. These gas vents exhaust hazardous productions of combustion to outside, not *environment air.*

Meeting the current requirements often adds extra elbows and pipe to the exhaust duct system, reducing the airflow through the duct. This is a wasted expense of no value.
(Vote: 9-2)

Final Hearing Results

M28-21 AS

M29-21 Part I

Original Proposal

IMC: 501.6 (New)

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Add new text as follows:

501.6 Common ducts. The discharge from exhaust fans serving separate dwelling or sleeping units shall not be connected to a common duct or shaft, except where the common duct or shaft is maintained at a negative pressure.

Reason: Exhaust ducts that are under positive pressure cannot be joined because the airflow from one fan will leak out through the fan that is not running. Only if the fans that share an exhaust duct are all running simultaneously, could backflow be prevented. Backdraft dampers in common exhaust fans have a significant leakage rate, thus the fan that is not running will see backflow from the common duct and the exhaust air from one space will dump into another space. If the fans discharge to a common exhaust shaft that is under negative pressure, there is no problem and this proposal would not prevent that arrangement. It is extremely undesirable (and unthinkable) to use a common duct for fans that serve different dwelling and sleeping units because odors, smoke, pathogens, chemical irritants, etc. would be carried from one unit to another.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 4.

Cost Impact: The code change proposal will increase the cost of construction

This proposal will increase the cost of construction only where the cost of an additional roof, wall or soffit penetration is more than the cost of larger common ducts, tee and wye fittings, fasteners, sealants and hangers and the extra labor to assemble common duct arrangements. This proposal will increase the cost of construction if additional roof or wall penetrations cost more than combined exhaust discharge ducts. Combining ducts into a common duct adds material costs, as does making roof and wall penetrations.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Positive pressure would be problematic in negative pressure environments. Exhaust ducts that are under positive pressure cannot be joined because the airflow from one fan will leak out through the fan that is not running. Only if the fans that share an exhaust duct are all running simultaneously, could backflow be prevented. Backdraft dampers in common exhaust fans have a significant leakage rate, thus the fan that is not running will see backflow from the common duct and the exhaust air from one space will dump into another space. If the fans discharge to

a common exhaust shaft that is under negative pressure, there is no problem and this proposal would not prevent that arrangement. It is extremely undesirable (and unthinkable) to use a common duct for fans that serve different dwelling and sleeping units because odors, smoke, pathogens, chemical irritants, etc. would be carried from one unit to another.

(Vote: 11-0)

Final Hearing Results

M29-21 Part I AS

M31-21

Original Proposal

IMC: 504.10

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

2021 International Mechanical Code

Revise as follows:

504.10 Commercial clothes dryers. The installation of dryer exhaust ducts serving commercial clothes dryers shall comply with the *appliance* manufacturer's installation instructions. Exhaust fan motors installed in exhaust systems shall be located outside of the airstream. In multiple installations, the fan shall operate continuously or be interlocked to operate when any individual unit is operating. Ducts shall have a minimum *clearance* of 6 inches (152 mm) to combustible materials. Clothes dryer transition ducts used to connect the*appliance* to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm) in length and shall be *listed* and *labeled* in accordance with UL 2158A ~~for the application~~. Transition ducts shall not be concealed within construction.

Reason: Clothes dryer transition ducts for both domestic and commercial applications are required to be listed and labeled. Section 504.9.3 requires UL 2158A for listing these types of ducts to UL 2158A for domestic installations. This proposal would also require UL 2158A in Section 504.10 for commercial installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code already requires these products to be listed and labeled. This proposal clarifies what standard is used.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal adds the appropriate UL standard for commercial clothes dryer installations. (Vote: 8-1)

Final Hearing Results

M31-21 AS

M32-21

Original Proposal

IMC: 505.3, 505.7 (New), 505.8 (New)

Proponents: John Williams, Healthcare Committee (ahc@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

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 airtight and shall be equipped with a backdraft damper. Installations in Group I-1 and I-2 *occupancies* shall be in accordance with~~the *International Building Code* and Section 904.14 of the International Fire Code~~ this section and Section 505.7 or 505.8.

Exceptions:

1. ~~In other than Groups I-1 and I-2, where~~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.

Add new text as follows:

505.7 Group I-1 Occupancies. In Group I-1 occupancies, hood installations over domestic cooking equipment shall be installed in accordance with one of the following:

1. Domestic hoods over cooktops and ranges installed in accordance with Section 420.9 of the International Building Code shall comply with the following:
   1.1. Protection from fire shall be in accordance with Section 904.14 of the International Fire code.
   1.2. Mechanical ventilation shall be provided to the rooms or spaces containing the cooking facility in accordance with Section 403.3.1.
   1.3. Hood systems shall have a minimum air flow of 500 cfm (14,000 L/min).
   1.4. Listed and labeled ductless range hoods shall have a charcoal filter to reduce smoke and odors.
2. Commercial kitchen hoods complying with Section 507 shall be provided over cooktops and ranges serving greater than 30 care recipients.

505.8 Group I-2 Occupancies. In Group I-2 Occupancies, Hood installations over domestic cooking equipment shall be installed in accordance with one of the following:

1. Domestic hoods over cooktops and ranges installed in accordance with Section 407.2.7 of the International Building Code shall comply with the following:
   1.1. Protection from fire shall be in accordance with Section 904.14 of the International Fire code.
   1.2. Mechanical ventilation shall be provided to the rooms or spaces containing the cooking facility in accordance with Section 407.
   1.3. Hood systems shall have a minimum air flow of 500 cfm (14,000 L/min).
   1.4. Listed and labeled ductless range hoods shall have a charcoal filter to reduce smoke and odors.

2. Commercial kitchen hoods complying with Section 507 shall be provided over cooktops and ranges serving greater than 30 care recipients.

Reason: In I-1 and I-2 Occupancies, Section 407.2.6 and 420.8 set up a number of safeguards that allow for meal preparation for up to 30 care recipients. These cooking operations are on a lower scale than commercial cooking facilities and do not generate the same level of smoke and vapors. The aroma of food cooking is beneficial to the care recipients who live in I-1 and I-2 occupancies as it stimulates appetite and signals them that mealtime is near.
The hoods in question are not your standard domestic range hood. Hoods for I-1 and I-2 Occupancies must comply with Section 904.14 of the *International Fire Code*. This section requires hoods that are listed and labeled per UL 300A, have fire suppression built in, and have an interlock that cuts the fuel or power source upon activation of the extinguishing system. Stovetops must also have a timer that automatically turns off the cooking device after 120 minutes, preventing unattended cooking.

Federal Guidelines that govern I-2 Occupancies permit recirculating hoods with a charcoal filter and also require a higher airflow rate. This added language is being added to allow equivalent facilitation.

For commercial cooking facilities, compliance with NFPA 96 is required. However, NFPA 96 (Chapter 13) allows for the use of re-circulating hoods in commercial cooking operations, there is no justification to prohibit the use in these domestic uses.The issue at hand is that sometimes, especially in a renovation of a multi-story building, it can be impractical or impossible to run an exhaust duct to the outside. By requiring a vented hood, it would prevent many communities from being able to provide better food quality and a social experience that can be critical to quality of life.

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 2020 the CHC held several virtual meeting, 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 CHC.

Cost Impact: The code change proposal will decrease the cost of construction
The cost of a domestic hood is less than a commercial hood and associate duct work.

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: The committee agrees that the the proposal language as written is problematic in this section and is missing the option of ducted installations for domestic hoods provided over cook tops. (Vote: 11-0)

Public Comments

Public Comment 1

Proponents: John Williams, Healthcare Committee (ahc@iccsafe.org) requests As Modified by Public Comment

Replace as follows:

2021 International Mechanical Code

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 airtight and shall be equipped with a backdraft damper. Installations in Group I-1 and I-2 *occupancies* shall be in accordance with the *International Building Code* and Section 904.14 of the International Fire Code and Section 505.7 or 505.8.

Exceptions:

1. ~~In other than Groups I-1 and I-2, where~~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.

505.7 Group I-1 Occupancies . In Group I-1 Occupancies, hood installations over domestic cooking equipment installed in accordance with Section 420.9 of the International Building Code shall comply with the following:

1. Range hoods shall have a minimum air flow rate of 500 cfm. (14,000 L/min).
2. Mechanical ventilation shall be provided to the rooms or spaces containing the domestic cooking equipment in accordance with Section 403.3.1.
3. Range hood exhaust shall discharge to the outdoors.

   Exception: A listed and labeled ductless range hood shall be permitted where a charcoal filter is provided in the hood to reduce smoke and odors.

505.8 Group I-2 Occupancies . In Group I-2 Occupancies, hood installations over domestic cooking equipment installed in accordance with Section 407.2.7 of the International Building Code shall comply with the following:

1. Range hoods shall have a minimum air flow rate of 500 cfm. (14,000 L/min).
2. Mechanical ventilation shall be provided to the rooms or spaces containing the domestic cooking equipment in accordance with Section 403.3.1.
3. Range hood exhaust shall discharge to the outdoors.

   Exception: A listed and labeled ductless range hood shall be permitted where a charcoal filter is provided in the hood to reduce smoke and odors.

Commenter's Reason: The intent of this code change is to allow listed and labeled ductless domestic range hoods, that meet specific criteria, over domestic cooking appliances in limited applications for I-1 and I-2 Occupancies. This Public Comment proposal addresses the comments the CHC heard from the committee and opponents:
First, we were told it was confusing to bring the language referencing commercial kitchen hoods into Section 505, which only addresses domestic cooking, so we have removed that language. This doesn't change any requirements when using commercial appliances, or

prevent a designer from choosing to provide a type 1 hood over a domestic range.

Secondly, we heard that it was not clear in the initial proposal that it was a choice between ducting to the outdoors OR using a ductless (re-circulating) exhaust hood in these applications. For this reason, we have changed the ductless hood to be an exception to the requirement to vent to the outdoors. There are some conditions that arise, that make it difficult, or impossible, to vent a hood to the outdoors. We feel that this proposal is providing the adequate levels of safety for I-1 and I-2 care recipients, whether vented or ductless.

Please keep in mind that, by referencing Section 420.9 and Section 407.2.7 of the International Building Code, the range hoods in question are used only over domestic cooking appliances (cooktops and ranges) and are located either within individual dwelling units (I-1 only), in kitchens serving 30 or fewer care recipients, or in areas like a Physical Therapy or staff break room. The sections referenced also require additional safeguards like staff access to turn on the appliance and a timer that shuts off the appliance after 120 minutes, if not attended. These cooking provisions have been in the Codes since 2015, for nursing homes.

Further, the reference to the International Fire Code points to the requirement for fire suppression to be built into the hood, with manual activation and interconnection that turns off the cooking appliance. As I-1 and I-2 Occupancies are already required to be sprinkled, this brings another level of safety. NFPA data, NIST Special Report 1066 and further research by NIST (TN 1969), has shown that a single residential sprinkler head can extinguish a cooking oil fire in a skillet.

The addition of the charcoal filter in the ductless hood was meant to address the concerns from opponents on smoke, vapors and particulate matter being circulated through the space. This charcoal filtration matches the requirements in NFPA 96 for ductless (re-circulating) Commercial Kitchen hoods. NFPA 96 does allow for ductless hoods in commercial cooking applications. Keep in mind that the application this proposal addresses is only serving up to 30 residents total, which is at a much lower rate of meal service than a typical restaurant or other commercial application.

Setting the airflow requirement through the hood at 500 cfm, this matches the federal guidelines for this type of cooking operation and does a better job of capturing any fumes, grease laden vapors, etc from cooking operations. Standard domestic range hoods typically only provide 220 – 375 cfm so this is a significant increase. Several research studies have shown that higher air flow rates result in higher capture efficiencies and provide better indoor air quality.

Further, per Section 505.4, any exhaust hood over 400 cfm is required to be provided with equivalent make-up air systems. This ensures that sufficient fresh air is being brought into the space to offset impacts of cooking operations. The requirement in this text for mechanical ventilation, not natural ventilation, reinforces this requirement and ensures that adequate ventilation will be provided to mitigate air quality concerns.

This is the last part of a package of code changes around cooking that recognize what has been “done for years” in I-1 Assisted Living and I-2 Nursing Home occupancies but to get it in the codes as a consistent and safe application nationwide and so that AHJ’s have one set of rules that are easier to enforce. The Center for Medicare and Medicaid Services (CMS), who oversee Hospitals, Nursing Homes and Ambulatory Care Occupancies has allowed these cooking applications with re-circulating domestic range hoods since 2012. The CHC was established to work towards bringing the I-Codes in line with the Federal Guidelines and enable the I-codes to stand as an equivalent option. This code change is a needed piece to this equivalency status.

Example kitchen

Example kitchen

Range with timer control and grease collecting hood.

Bibliography: Singer, Brett C. 2011 Experimental Evaluation of Installed Cooking Exhaust Fan Performance, Lawrence Berkeley National Lab, LBNL-4183E

EPA website: https://www.epa.gov/indoor-air-quality-iaq/improving-indoor-air-quality

EPA Indoor Air Plus Program: https://www.epa.gov/sites/production/files/2018-03/documents/indoor_airplus_fillable_verification_checklist.pdf

Cost Impact: The net effect of the Public Comment and code change proposal will decrease the cost of construction
The cost of a domestic hood is less than a commercial hood and associate duct work.

Final Hearing Results

M32-21 AMPC1

M34-21

Original Proposal

IMC: 506.2

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

506.2 Corrosion protection. Ducts and exhaust equipment exposed to the outside atmosphere or subject to a corrosive environment shall be protected against corrosion in an *approved* manner.

Reason: Any portion of the commercial kitchen hood ventilation duct system and exhaust equipment that is exposed to the outside atmosphere, regardless of whether for Type I or Type II applications, should be protected against corrosion.
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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3B.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Exhaust equipment (such as fans) that are*listed* for outdoor service are already protected against corrosion. The proposal is stating what is already required through the listing of the equipment. The equipment isn't any different than what is being selected for outdoor service.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal passed based on the proponent reason statement that exhaust equipment exposed to the exterior would have to be protected against corrosion. (Vote: 6-5)

Final Hearing Results

M34-21 AS

M35-21

Original Proposal

MC: (New), 506.3, 506.3.1, 506.3.1.1, 506.3.2, 506.3.2.1, 506.3.2.2, 506.3.2.3, 506.3.2.4, 506.3.2.5, 506.3.3, 506.3.4, 506.3.5, 506.3.7, 506.3.7.1, 506.3.8, 506.3.8.1, 506.3.8.2, 506.3.9, 506.3.10, 506.3.11, 506.3.11.1, 506.3.11.2, 506.3.11.3, 506.3.12, 506.3.13, 506.5.1.2, 506.5.2, 506.5.4, 507.1 [IFC 606.2] , 507.2.4, 506.3.1.2

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Add new definition as follows:

GREASE DUCT

.

A duct serving a Type I hood, or cooking appliances equipped with integral down-draft exhaust systems that produce grease, to convey grease-laden air from the hood or cooking appliance directly to the outdoors.

Revise as follows:

506.3 ~~Ducts serving Type I hoods~~ Grease duct systems. ~~Type I exhaust ducts shall be independent of all other exhaust systems except as provided in Section 506.3.5. Commercial kitchen~~ *Grease* duct systems ~~serving Type I hoods~~ shall be designed, constructed and installed in accordance with Sections 506.3.1 through 506.3.13.3.

Delete without substitution:

~~506.3.1 Duct materials.~~ ~~Ducts serving Type I hoods shall be constructed of materials in accordance with Sections 506.3.1.1 and 506.3.1.2.~~

Revise as follows:

506.3.1.1 506.3.1 Grease duct materials. Grease ducts ~~serving Type I hoods~~ shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) or stainless steel not less than 0.0450 inch (1.14 mm) (No. 18 gage) in thickness.

Exception: Factory-built commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978 and installed in accordance with Section 304.1.

~~506.3.2~~ Joints, seams and penetrations of grease ducts. Joints, seams and penetrations of grease ducts shall be made with a continuous liquid-tight weld or braze made on the external surface of the grease duct system.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.
2. Internal welding or brazing shall not be prohibited provided that the joint is formed or ground smooth and is provided with ready access for inspection.
3. Factory-built commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978 and installed in accordance with Section 304.1.

506.3.2.1 Grease ~~Duct~~ duct joint types. Grease duct ~~Duct~~ joints shall be butt joints, welded flange joints with a maximum flange depth of $^1/_2$ inch (12.7 mm) or overlapping duct joints of either the telescoping or bell type. Overlapping joints shall be installed to prevent ledges and obstructions from collecting grease or interfering with gravity drainage to the intended collection point. The difference between the inside cross-sectional dimensions of overlapping sections of duct shall not exceed $^1/_4$ inch (6.4 mm). The length of overlap for overlapping duct joints shall not exceed 2 inches (51 mm).

506.3.2.2 Grease ~~Duct~~ duct-to-hood joints. Grease ~~Duct~~ duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, accessible for inspection, and without grease traps.

Exceptions: This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:
   1.1. The ~~hood duct opening~~ the exhaust outlet of the hood shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees (1.57 rad) from the plane of the opening.
   1.2. The grease duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the grease duct not less than 1 inch (25 mm) above the bottom end of the duct.
   1.3. A gasket rated for use at not less than 1,500ºF (816ºC) is installed between thegrease duct flange and the top of the hood.
   1.4. The grease duct-to-hood joint shall be secured by stud bolts not less than $^1/_4$ inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. The bolts and nuts shall be secured with lockwashers.
2. *Listed* and *labeled grease* duct-to-hood collar connections installed in accordance with Section 304.1.

506.3.2.3 Grease ~~Duct~~ duct-to-exhaust fan connections. Grease ~~Duct~~ duct-to-exhaust fan connections shall be flanged and gasketed at the base of the fan for vertical discharge fans; shall be flanged, gasketed and bolted to the inlet of the fan for side-inlet utility fans; and shall be flanged, gasketed and bolted to the inlet and outlet of the fan for in-line fans. Gasket and sealing materials shall be rated for continuous duty at a temperature of not less than 1,500ºF (816ºC).

506.3.2.4 Vibration isolation. A vibration isolation connector for connecting a grease duct to a fan shall consist of noncombustible packing in a metal sleeve joint of *approved* design or shall be a coated-fabric flexiblegrease duct connector *listed* and *labeled* for the application. Vibration isolation connectors shall be installed only at the connection of a grease duct to a fan inlet or outlet.

506.3.2.5 Grease duct test. Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Grease ducts ~~Ducts~~ shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ~~ductwork~~ grease ducts from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid tight.

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section ~~odf uctwork~~ grease ducts to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire grease duct system, including the hood-to-duct connection. The grease duct ~~work~~ system shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.

506.3.3 Grease duct supports. Grease duct bracing and supports shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code* . Bolts, screws, rivets and other mechanical fasteners shall not penetrate grease duct walls.

506.3.4 Air velocity. Grease duct systems ~~serving a Type I hood~~ shall be designed and installed to provide an air velocity within thegrease duct system of not less than 500 feet per minute (2.5 m/s).

Exception: The velocity limitations shall not apply within grease duct transitions utilized to connect grease ducts to differently sized or shaped openings in hoods and fans, provided that such transitions do not exceed 3 feet (914 mm) in length and are designed to prevent the trapping of grease.

506.3.5 Separation of grease duct system. A separate grease duct system shall be provided for each Type I hood. A separate grease duct system is not required where all of the following conditions are met:

1. All interconnected hoods are located within the same story.
2. All interconnected hoods are located within the same room or in adjoining rooms.

3. Interconnecting grease ducts do not penetrate assemblies required to be fire-resistance rated.
4. The grease duct system does not serve solid-fuel-fired *appliances*.

506.3.7 Prevention of grease accumulation in grease ducts. ~~Duct~~ Grease 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 grease 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.

506.3.7.1 Grease duct reservoirs. Grease duct reservoirs shall:

1. Be constructed as required for the grease duct they serve.
2. Be located on the bottom of the horizontal grease duct or the bottommost section of the grease duct riser.
3. Extend across the full width of thegrease duct and have a length of not less than 12 inches (305 mm).
4. Have a depth of not less than 1 inch (25 mm).
5. Have a bottom that slopes to a drain.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the grease duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer’s instructions where manufactured devices are utilized.

506.3.8 Grease duct cleanouts and openings. Grease duct cleanouts and openings shall comply with all of the following:

1. Grease ducts shall not have openings except where required for the operation and maintenance of the system.
2. Sections of grease ducts that are inaccessible from the hood or discharge openings shall be provided with cleanout openings spaced not more than 20 feet (6096 mm) apart and not more than 10 feet (3048 mm) from changes in direction greater than 45 degrees (0.79 rad).
3. Cleanouts and openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the grease duct.
4. Cleanout doors shall be installed liquid tight.
5. Door assemblies including any frames and gaskets shall be approved for the application and shall not have fasteners that penetrate the grease duct.
6. Gasket and sealing materials shall be rated for not less than 1,500ºF (816ºC).
7. Listed door assemblies shall be installed in accordance with the manufacturer’s instructions.

506.3.8.1 Personnel entry. Where a grease duct ~~ductwork~~ is large enough to allow entry of personnel, not less than one*approved* or *listed* opening having dimensions not less than 22 inches by 20 inches (559 mm by 508 mm) shall be provided in the horizontal sections, and in the top of vertical risers. Where such entry is provided, the grease duct and its supports shall be capable of supporting the additional load, and the cleanouts specified in Section 506.3.8 are not required.

506.3.8.2 Cleanouts serving in-line fans. A cleanout shall be provided for both the inlet side and outlet side of an in-line fan except where a grease duct does not connect to the fan. Such cleanouts shall be located within 3 feet (914 mm) of the fan duct connections.

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 thegrease 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. Be located at grease reservoirs.
7. Be located within 3 feet (914 mm) of horizontal discharge fans.

506.3.10 Underground grease duct installation. Underground grease duct installations shall comply with all of the following:

1. Underground grease ducts shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) and shall be coated to provide protection from corrosion or shall be constructed of stainless steel having a minimum thickness of 0.0450 inch (1.140 mm) (No. 18 gage).
2. The underground grease duct system shall be tested and approved in accordance with Section 506.3.2.5 prior to coating or placement in the ground.
3. The underground grease duct system shall be completely encased in concrete with a minimum thickness of 4 inches (102 mm).
4. Ducts shall slope toward grease reservoirs.
5. A grease reservoir with a cleanout to allow cleaning of the reservoir shall be provided at the base of each verticalgrease duct riser.
6. Cleanouts shall be provided with access to permit cleaning and inspection of thegrease duct in accordance with Section 506.3.
7. Cleanouts in horizontal grease ducts shall be installed on the topside of thegrease duct.
8. Cleanout locations shall be legibly identified at the point of access from the interior space.

506.3.11 Grease duct enclosures. A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed space shall be enclosed from the point of penetration to the outlet terminal. In-line exhaust fans not located outdoors shall be enclosed as required for grease ducts. A grease duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code* . The grease duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Grease duct ~~Duct~~ enclosures shall be a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with Section 506.3.11.2 or a factory-built grease duct enclosure assembly in accordance with Section 506.3.11.3. Grease duct ~~Duct~~ enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Fire dampers and smoke dampers shall not be installed in grease ducts.

Exception: A grease duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

506.3.11.1 Shaft enclosure. Grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a*clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (152 mm). Shaft ~~Duct~~ enclosures shall be sealed around the grease duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

506.3.11.2 Field-applied grease duct enclosure. Grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a *listed* and *labeled* field-applied grease duct enclosure material, systems, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the grease duct shall be continuously covered on all sides from the point at which the grease duct originates to the outlet terminal. Grease duct ~~Duct~~ penetrations shall be protected with a through-penetration firestop system tested and *listed* in accordance with ASTM E814 or UL 1479 and having a “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions. Partial application of a field-applied grease duct enclosure shall not be installed for the sole purpose of reducing

clearances to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

506.3.11.3 Factory-built grease duct enclosure assemblies. Factory-built grease ducts incorporating integral enclosure materials shall be *listed* and *labeled* for use as grease duct enclosure assemblies specifically evaluated for such purpose in accordance with UL 2221. Grease duct ~~Duct~~ penetrations shall be protected with a through-penetration firestop system tested and*listed* in accordance with ASTM E814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure assembly and firestop system shall be installed in accordance with the listing and the manufacturer's instructions.

506.3.12 Grease duct fire-resistive access opening. Where cleanout openings are located ingrease ducts within a fire-resistance-rated enclosure, access openings shall be provided in the enclosure at each cleanout point. Access openings shall be equipped with tight-fitting sliding or hinged doors that are equal in fire-resistive protection to that of the shaft or enclosure. An *approved* sign shall be placed on access opening panels with wording as follows: "ACCESS PANEL. DO NOT OBSTRUCT."

506.3.13 Exhaust outlets ~~serving Type I hoods.~~ Exhaust outlets for grease ducts ~~serving Type I hoods~~ shall conform to the requirements of Sections 506.3.13.1 through 506.3.13.3.

506.5.1.2 In-line fan location. Where enclosed grease duct systems are connected to in-line fans not located outdoors, the fan shall be located in a room or space having the same fire-resistance rating as the grease duct enclosure. Access shall be provided for servicing and cleaning of fan components. Such rooms or spaces shall be ventilated in accordance with the fan manufacturer's installation instructions.

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.
2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with UL 762.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*.
4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. Where enclosed grease duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.
5. *Clearances* shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
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. Grease duct ~~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). Grease ducts ~~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.

506.5.4 Exhaust fan mounting. Upblast fans serving Type I hoods and installed in a vertical or horizontal position shall be hinged, supplied with a flexible weatherproof electrical cable to permit inspection and cleaning and shall be equipped with a means of restraint to limit the swing of the fan on its hinge. The grease duct system ~~ductwork~~ shall extend not less than 18 inches (457 mm) above the roof surface.

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, grease 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.

507.2.4 Type I supports. Type I hoods shall be secured in place by noncombustible supports. Type I hood supports shall be adequate for the applied load of the hood, the unsupported grease duct system ~~ductwork~~, the effluent loading and the possible weight of personnel working in or on the hood.

~~**506.3.1.2**~~ **508.1.2 Makeup air ducts.** *Makeup air* ducts connecting to or within 18 inches (457 mm) of a Type I hood shall be constructed and installed in accordance with Sections 603.1, 603.3, 603.4, 603.9, 603.10 and 603.12. Duct insulation installed within 18 inches (457 mm) of a Type I hood shall be noncombustible or shall be *listed* for the application.

Reason: This proposal addresses four issues for the purpose of clarifying the code. There are no technical substantive changes.

1. **Terminology** – The term "grease ducts" is a common term throughout the IMC, used 60 times throughout Sections 506 and 507. By definition, a "duct serving Type I hoods" is a "grease duct". It is redundant for the code to state "grease ducts serving Type I hoods", because they have no other purpose. This proposal clarifies the code by clearly defining what a "grease duct" is, and by using the term consistently in all the locations that apply to these specific types of ducts. The term "ductwork" is replaced with "grease duct" or "grease duct system", depending on the context of each application, in order to provide clarity.
2. **Grease ducts independent of other exhaust systems –** Section 506.3.5 already requires grease ducts to be independent of all other exhaust systems, except where four conditions are met. This is unnecessary language in the code, because the second sentence of this Section already requires compliance of these grease ducts to Section 506.3.5. This also removes a conflict, because there are no exceptions to Section 506.3.5.
3. **Ducts for cooking appliances equipped with integral down-draft exhaust systems**- Exception 3 of Section 507.1 exempts

cooking appliances equipped with integral down-draft exhaust systems from the requirements for Type I hoods, but does not identify any requirements for the duct system serving these appliances. This proposal is intended to provide direction on the type of duct system to be used for these installations. NFPA 96 requires the duct system serving these cooking appliances to comply with the requirements for grease ducts.

4 . **Makeup air duct construction relocation** - Section 506.3.1.1 is regarding the construction and installation of the makeup air ducts, not grease ducts that are serving Type I hoods. Thus, this requirement belongs in Section 508, not as a sub-section for Section 506.3.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3A.

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

This proposal only clarifies/reorganizes the current code requirements. No additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. As such, there is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal is editorial and adds a new definition of Grease Duct for more clarification. (Vote: 11-0)

Final Hearing Results

M35-21 AS

M36-21

Original Proposal

IMC: 506.5.2

Proponents: Richard Grace, Fairfax County, Virginia, Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and Virginia Building and Code Officials Association (VBCOA) (richard.grace@fairfaxcounty.gov)

2021 International Mechanical Code

Revise as follows:

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.
2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with UL 762.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*.
4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. ~~Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.~~
5. Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listingWhere enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit installed indoors, all of the following shall apply:
   5.1. The unit shall be listed and labeled, in accordance with UL 2221 or ASTM E2336, for location in an enclosure.
   5.2. The unit shall be installed in a dedicated room or space enclosure, constructed as required by Section 506.3.11, having the same fire-resistance rating as the duct enclosure.
   5.3. Access shall be provided for servicing and cleaning of the unit.
   5.4. The dedicated room or space enclosure shall be ventilated in accordance with the manufacturer's installation instructions.

~~5~~6. *Clearances* shall be maintained between the pollution-control unit and combustible materials in accordance with the listing.

~~6~~7. Roof-mounted pollution-control units shall be listed for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof.

~~7~~8. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.

~~8~~9. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur.

~~9~~10. Pollution-control units shall be provided with a factory-installed fire suppression system.

~~10~~11. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.

~~11~~12. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings.

~~12~~13. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.

~~13~~14. 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~~15. 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~~16. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

Reason: This change serves to clarify the multiple conditions listed in item four.
1. The first sentence in item four was left to remain, however we have no objections to deleting it all together should there be consensus. Reason - item one states that pollution-control units be listed and labeled in accordance to UL 8782. It is our understanding that this standard covers listing and labeling of pollution-control units installed indoors, as well as outdoors, thereby making the first sentence redundant. The remainder of the section was extracted and rewritten.

2. The second sentence as written doesn't express precisely it's intent, and was separated into 5.1 and 5.2. Multiple interpretations can be derived from this sentence. One interpretation is that the PCU has to be listed and labeled for location within an enclosure, but no longer actually requires that an enclosure be provided. Note - "shall be located in a room or space …" was deleted when this language was added. Another interpretation is that the unit itself is listed and labeled through UL 2221 or ASTM E2336 as an enclosure, so an additional enclosure is not required. A third interpretation is that the PCU can be wrapped in a UL 2221 or ASTM E2336 duct wrap system that can serve as the enclosure. We don't believe any of these interpretations are correct, but that the intent was to have the PCU, installed for indoor use, use only the test methods contained within UL 2221 or ASTM E2336 to evaluate the enclosure's effect on the pollution control unit. Subsection b brings back the requirement for the PCU to be installed in a rated room or space. It also adds the distinction of a "dedicated" room or space in order to discourage installation of a PCU in a rated trash room or machinery room or similar room which can create more hazard should there be a fire with in the grease duct system.

3. Subsection 5.3. has not changed.

4. Subsection 5.4. clarified the existing language of "space or enclosure" to be in line with subsection 5.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The code requirements are not proposed to be changed but rather clarified as to the intent of the current code.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal is editorial and removes redundant language. (Vote: 11-0)

Final Hearing Results

M36-21 AS

M38-21

Original Proposal

IMC: 506.3.2.5, 506.3.2.5.3.1 (New), 506.3.2.5.2 (New)

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

506.3.2.5 Grease duct test. A field test shall be performed ~~Prior~~ prior to the use or concealment of any portion of a grease duct system~~, a leakage test shall be performed~~. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. ~~A light test shall be performed to determine that all welded and brazed joints are liquid tight.A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls.~~ A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds. The test shall be performed in accordance with either Section 506.3.2.5.1 or Section 506.3.2.5.2.

Add new text as follows:

506.3.2.5.3.1 Light test. A duct test shall be performed by passing a lamp having not less than 1600 lumens, through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A successful test shall be where the light from the lamp is not visible at any point on the exterior of the duct.

506.3.2.5.2 Water spray test. A duct test shall be performed by simulating a cleaning operation, of the interior of the duct. A water pump, capable of a flowing outlet pressure of not less than 1200 psi (8,274 kPa) shall be used, along with any necessary hoses and spray nozzles, to apply high pressure water to the inside surfaces of the duct. A successful test shall be where there is no evidence of cleaning water at any point on the exterior of the duct.

Reason: There are several reasons for this proposal.
Some installers are using LED lamps for testing and such lamps are not rated, in terms of light output, in watts of power but instead in lumens of visible light. LED lamps are more rugged that incandescent lamps and are often preferred for field use.
The ASHRAE 154 (Ventilation for Commercial Cooking Standard) committee is moving away from light testing of grease ducts to simulated duct cleaning using water. Actual duct cleaning in the future should not result in water damage to the structure or to any materials that are used to wrap the duct. Furthermore, if a water leak is present, then almost certainly, grease will be present on the exterior of the duct. Grease on the exterior of a duct presents a fire hazard.

The installer has a choice as to which test to use.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 14.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds an alternative for testing grease ducts. Although the alternative for water spray testing would cost more to perform than the light test, the alternative will not be mandated by the code and therefore, the proposal does not add any labor or material to impact the

cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was approved as submitted because, as opposed to M37-21, it helps give better directive and tools to use with respect to testing of Grease Ducts. (Vote: 7-4)

Public Comments

Public Comment 1

Proponents: Nancy Swearengin, Pikes Peak Regional Building Department, Self requests As Submitted

Commenter's Reason: 506.3.2.5.3.1 Light Test: Allowing the use of LED lights for grease duct testing would be a welcome addition in the field. Most mechanical contractors are only using LED lights on site, this addition to the code would allow inspections to be completed using equipment readily available. LED lights are brighter, more durable and operate at much cooler temperatures reducing the potential for harm to personnel performing the test. Vote to approve.
506.3.2.5.2 Water Spray Test: While the intent to provide more options for grease duct testing is admirable this method should not be allowed. Introducing water onto a job site presents many problems. Often times water is not available, testing is done in the winter with cold temperaturs (below freezing), power to the area is being supplied through temporary wiring and other personnel not involved in the testing are working in the same area. On all job sites any spills are supposed to be immediately cleaned up to prevent slips and falls, intentionally spraying water goes against all normal safety protocols. Testing of grease ducts is often done in sections, not after the entire system has been installed. In the real world of testing, during the rough phase of construction, it would almost impossible to truly simulate duct cleaning as described in this proposal. Vote to disapprove.

Cost Impact: The net effect of the Public Comment and code change proposal will increase the cost of construction
506.3.2.5.3.1 Light Test will not increase the cost of construction.

506.3.2.5.2 Water Spray Test will increase the cost of construction due to the equipment required, cost of water and the time spent for clean up.

Final Hearing Results

M38-21 AS

M39-21

Original Proposal

IMC: 506.5.1, 506.5.2

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

2021 International Mechanical Code

Revise as follows:

506.5.1 Exhaust fans. Exhaust fan housings serving a Type I hood shall be constructed as required for grease ducts in accordance with Section 506.3.1.1.

Exception: Fans *listed* and *labeled* in accordance with ~~UL 762~~. UL 705

506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.
2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with ~~UL 762~~.UL 705.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *International Building Code*.
4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.
5. *Clearances* shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
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.

Reason: The requirements for UL 762 have been completely incorporated into UL 705. The product certification listings are moving from UL 762 to UL 705.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The product testing and certification requirements have only been relocated, not changed.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted based on the fact that it references the actual standard that equipment is being held to. The requirements for UL 762 have been completely incorporated into UL 705. The product certification listings are moving from UL 762 to UL 705. (Vote: 10-0)

Final Hearing Results

M39-21 AS

M40-21

Original Proposal

IMC: 507.1[IFC 606.2], 507.1.1, 507.1.2, 507.4, 507.4.1, 507.4.2, 507.6, 507.6.1, 507.5.1, 507.5.2, 507.5.3, 507.5, 509.1, 507.3, 507.3.4 (New), 507.5.4, 507.5.5

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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 hood shall be installed at or above appliances in accordance with Section 507.2. ~~or~~ A Type II hood shall be installed at or above *appliances* in accordance with ~~Sections 507.2 and~~ Section 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. 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, and 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, 507.1.6 507.2.3, 507.2.5, 507.2.8, 507.2.10 507.3.1, and 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, 507.1.6 507.2.3, 507.2.5, 507.2.8, 507.2.10 507.3.1, and 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.

507.1.1 Operation. Commercial kitchen exhaust hood systems shall operate during the cooking operation. The hood exhaust rate shall comply with either the listing of the hood Section 507.2.10, or ~~shall comply with~~ Section 507.3.4 ~~507.5~~. The exhaust fan serving a Type I hood shall have automatic controls that will activate the fan when any *appliance* that requires such Type I hood is turned on, or a means of interlock shall be provided that will prevent operation of such *appliances* when the exhaust fan is not turned on. Where one or more temperature or radiant energy sensors are used to activate a Type I hood exhaust fan, the fan shall activate not more than 15 minutes after the first *appliance* served by that hood has been turned on. A method of interlock between an exhaust hood system and *appliances* equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking *appliances* shall not involve or depend on any component of a fire-extinguishing system.The net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking *appliances* that are operating in a standby mode.

507.1.2 Domestic cooking appliances used for commercial purposes. Domestic cooking *appliances* utilized for commercial purposes shall be provided with either Type I or Type II hoods as required for the type of *appliances* and processes in accordance with Sections 507.2 and 507.3. Domestic cooking *appliances* utilized for domestic cooking shall comply with Section 505.

~~507.4~~ **507.1.6 Hood size and location.** Hoods shall comply with the overhang, setback and height requirements in accordance with Sections ~~507.4.1~~ 507.6.1 and ~~507.4.2~~ 507.1.6.2, based on the type of hood.

~~507.4.1~~ **507.1.6.1 Canopy size and location.** The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the *appliance* on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the*appliance* side by a noncombustible wall or panel.

~~507.4.2~~ **507.1.6.2 Noncanopy size and location.** Noncanopy-type hoods shall be located not greater than 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back not greater than 1 foot (305 mm) from the edge of the cooking surface.

~~507.6~~ **507.1.7 Performance test.** A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving *commercial cooking appliances*. The test shall verify the rate of exhaust airflow required by Section ~~507.5~~ 507.2.10 or Section 507.3.4, makeup airflow required by Section 508 and proper operation as specified in this chapter. The permit holder shall furnish the necessary test *equipment* and devices required to perform the tests.

~~507.6.1~~ **507.1.7.1 Capture and containment test.** The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all *appliances* under the hood at operating temperatures, with all sources of outdoor air providing *makeup air* for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as that provided by smoke generators. .

~~507.5.1~~ **507.2.2.10.1 Extra-heavy-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for *extra-heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	Not allowed
Double island canopy (per side)	550
Eyebrow	Not allowed
Single island canopy	700
Wall-mounted canopy	550

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~507.5.2~~ **507.2.2.10.2 Heavy-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for *heavy-duty cooking appliances* shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	400
Double island canopy (per side)	400
Eyebrow	Not allowed
Single island canopy	600
Wall-mounted canopy	400

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~507.5.3~~ **507.2.2.10.3 Medium-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for *medium-duty cooking appliances* shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**

Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~507.5~~ **507.2.10 Capacity of Tye I hoods.** Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections ~~507.5.1~~ 507.2.10.1 through ~~507.5.5~~ 507.2.10.4. The net quantity of *exhaust air* shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of *heavy-duty, medium-duty* and *light-duty cooking appliances* are utilized under a single hood, the exhaust rate required by this section for the heaviest duty *appliance* covered by the hood shall be used for the entire hood.

~~509.1~~ **507.2.11** ~~**Where required**~~ **Fire suppression systems.** ~~*Cooking appliances* required by Section 507.2 to have~~ a Type I hood shall be provided with an *approved* automatic fire suppression system complying with Section 904.12 of the *International Building Code* and the *International Fire Code* .

507.3 Type II hoods. Type II hoods shall be installed above *light-duty cooking appliances* dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 $m^3/(s \cdot m^2)$). For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \cdot m^2)$].

Add new text as follows:

507.3.4 Capacity of Type II hoods. Type II hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.3.4.1 through 507.3.4.2. The net quantity of exhaust air shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood.

Revise as follows:

~~507.5.4~~ **507.3.4.1 Light-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for *light-duty* cooking *appliances* and food service preparation shall be determined as follows:

Type of Hood	**CFM per linear foot of hood**
Backshelf/pass-over	250
Double island canopy (per side)	250
Eyebrow	250
Single island canopy	400
Wall-mounted canopy	200

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

~~507.5.5~~ **507.3.4.2 Dishwashing appliances.** The minimum net airflow for Type II hoods used for dishwashing *appliances* shall be 100 cfm per linear foot (155 L/s per linear meter) of hood length.

Exception: Dishwashing *appliances* and *equipment* installed in accordance with Section 507.3.

Reason: This proposal is intended to reorganize the existing requirements in Section 507 into a logical order of application, while not making any substantive technical changes. There are other proposals from the PMGCAC that are intended to address specific technical issues within the existing requirements. This proposal:

1. Reorganized Section 507 into three main sections –
   Section 507.1 addresses general requirements that apply to both Type I and Type II hoods

   Section 507.2 addresses additional requirements that apply to Type I hoods

   Section 507.3 addresses additional requirements that apply to Type II hoods
2. Added "light duty cooking appliances to Section 507.3 (Type II hoods) because the existing code requirements do not include these appliances specifically under either Type I or Type II hoods.
3. Removed the pointer in the sections containing the prescriptive code calculations to determine hood capacities (originally under Section 507.5), because there is nothing in Section 507.1 regarding the determination.4. Relocated the requirement in Section 509 to Section 507.2 because Section 509 has only one application, which is for use in Type I hoods. This section should be included with all the other requirements for Type I hoods in Section 507.2.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3C.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only clarifies/reorganizes the current code requirements, no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. As such, there is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal passed as submitted based on the proponent reason statement. This proposal appropriately reorganizes the existing requirements in Section 507 into a logical order of application, while not making any substantive technical changes. (Vote: 11-0)

Final Hearing Results

M40-21 AS

M41-21

Original Proposal

IMC: 507.1[IFC 606.2], 507.3

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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.

507.3 Type II hoods. Type II hoods shall be installed above dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. A Type I hood shall be permitted to be installed for a required Type II hood provided that the Type I hood installation complies with all of the requirements for a Type I hood installation. Where such a Type I hood serves only dishwashers and appliances that require a Type II hood, the Type I hood shall not be required to have fire suppression or grease filters. Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 $m^3/(s \cdot m^2)$. For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \cdot m^2)$].

Reason: The deleted sentence in 507.1 has been widely misunderstood since it was added to the code many cycles ago. There is a market for pre-owned Type I hoods. Commercial kitchen outfitters commonly utilize used kitchen equipment for new and remodeled kitchens. However, where the application only requires a Type II hood, installers have been known to only install Type II ductwork to the hood. Should a reorganization of the kitchen locate an appliance requiring a Type I hood under this hood, the ductwork (usually concealed) would not comply with that required for a Type I hood. This is dangerous. The sentence was reworded for clarity and placed in the Type II hood paragraph where it belongs.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3J.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The allowance (along with the requirements) are in the existing code but were difficult to understand. This proposal only clarifies the code and clarifications do not impact material or labor costs.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal is not requiring anyone to use a Type I hood in applications requiring a Type II hood, rather it is allowing the Type I hood if it is installed in full compliance with Type I hood installation requirements. (Vote: 11-0)

Final Hearing Results

M41-21 AS

M42-21

Original Proposal

IMC: 507.1[IFC 606.2]

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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. A hood shall not be required at or above any of the following:

   22.1. 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 m2).

   3 2.2. ~~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 2.3. Smoker ovens with integral exhaust systems~~, provided~~ that ~~the appliance is installed in accordance with the manufacturer's installation instructions, is~~ are listed and tested for the application~~, and complies with Chapter 5~~.

Reason: The purpose of this proposal is to clarify the three existing exceptions for Section 507.1 where because of the particular type of product or cooking operation, a hood is not required above the product or cooking operation.

1. Factory-built commercial cooking recirculating systems listed and labeled in accordance with UL 710B include a hood to capture and contain the cooking effluents, which are processed through a series of filters. The filtered air is returned back into the same space as the system. Thus, these systems are an alternative to all the requirements in Section 507, and do not require an additional hood or any grease duct system. There is no need to identify all the sections that these systems are exempt.
2. The exception for cooking appliances that are equipped with integral down-draft exhaust systems. ovens with integral exhaust systems is revised editorially.
3. The exception for smoker ovens with integral exhaust systems is revised editorially. Section 304.1 of the IMC already requires listed equipment and appliances to be installed in accordance with the manufacturer's installation instructions. The general reference to compliance with Chapter 5 does not provide specific direction. Section 507 provides hood requirements. Section 506 will apply to the grease duct and exhaust equipment that is serving these types of smoker ovens.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee

meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3D.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only clarifies the current code requirements, no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. As such, there is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal passed as submitted based on the reason statement provided by the proponent. This proposal appropriately clarifies the three existing exceptions for Section 507.1 where because of the particular type of product or cooking operation, a hood is not required above the product or cooking operation. (Vote: 11-0)

Final Hearing Results

M42-21 AS

M43-21

Original Proposal

IMC: 507.1[IFC 606.2]

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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.
5. <u>Ovens listed and labeled for use with wood fuel in accordance with UL 2162 and vented in accordance with the manufacturer's instructions.</u>

Reason: Some solid fuel-fired ovens that are listed and labeled in accordance with UL 2162 have integral venting/exhaust combination. The manufacturer’s installation instructions for these types of cooking equipment provide specifics on what venting and exhaust systems are to be used, and that they are to be vented directly outside. Typically what is used is a factory built chimney that has been tested and listed to both UL 103 (factory built chimneys) and UL 1978 (grease ducts). A hood above these types of oven installations would be redundant.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3E.

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

Because this proposal only provides an alternative to the current code requirements, there is no additional labor, materials, equipment, appliances or devices mandated beyond what is currently required by the code. Alternatives generally lower the cost of construction. As such, there is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Passed as submitted because the committee agreed that the UL standard is appropriate to allow the exception for ovens. (Vote: 11-0)

Final Hearing Results

M43-21 AS

M44-21

Original Proposal

IMC: 507.1[IFC 606.2], 507.2

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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.
5. <u>An electric cooking appliance listed and labeled in accordance with UL 197 for reduced grease emissions.</u>

507.2 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances*.

~~**Exception:** A Type I hood shall not be required for an electric cooking *appliance* where an approved testing agency provides documentation that the *appliance* effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with UL 710B~~.

Reason: The exception in Section 507.2 for electric cooking appliances that the effluent emitted from the contains 5 mg/m3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m3/s) in accordance with UL 710B should be relocated as an additional exception to Section 507.1. A hood above these types of appliances would be redundant. The requirements for “reduced grease emissions” evaluation and testing for cooking appliances have been moved to an appendix of UL 197, which contains specific details on how to run these tests with this criteria, as well as providing product marking requirements. Providing documentation of a test performed of a particular product does not demonstrate that the specific product installed at the jobsite is constructed in the same manner with the same materials as the sample that was originally tested, whereas a listing (certification) mark does.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee

meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3F.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because this proposal only provides an alternative to the current code requirements, there is no additional labor, materials, equipment, appliances or devices mandated beyond what is currently required by the code. Alternatives generally lower the cost of construction. As such, there is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal appropriately aligns the code requirements while acknowledging the relocation of test methods within the body of UL197. (Vote: 11-0)

Final Hearing Results

M44-21 AS

M45-21

Original Proposal

IMC: 507.1[IFC 606.2], UL Chapter 15 (New)

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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.
5. Commercial electric dishwashers incorporating a self-contained condensing system listed and labeled in accordance with UL 921.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

921-20 Standard for Commercial Dishwashers

Reason: UL 921 includes requirements for evaluating and certifying self-contained condensing systems that do not require a Type II hood above. A hood above a UL 921 dishwasher would be redundant.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3G.

Cost Impact: The code change proposal will decrease the cost of construction
This proposal provides an alternative to providing Type II hoods for specific appliances. Not having to provide and install a Type II hood for UL 921 dishwashers saves significant material costs and labor costs for Type II hoods.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Appropriately adds an existing exception with commercial dishwasher listed and incorporating a self-contained condensing system. (Vote: 11-0)

Final Hearing Results

M45-21 AS

M46-21

Original Proposal

IMC: 507.1[IFC 606.2], 507.3, 507.5.5

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 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.
5. Where the heat and moisture loads from dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system design or into the design of a separate removal system. Spaces containing such cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 m3/(s • m2). For the purpose of determining the floor area required to be exhausted, each individual appliance that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 m3/(s • m2)].

507.3 Type II hoods. Type II hoods shall be installed above dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process~~, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system~~. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. ~~Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 $m^3/(s \cdot m^2)$). For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 $m^3/(s \cdot m^2)$].~~

507.5.5 Dishwashing appliances. The minimum net airflow for Type II hoods used for dishwashing *appliances* shall be 100 cfm per linear

foot (155 L/s per linear meter) of hood length.

~~Exception:~~ ~~Dishwashing *appliances* and *equipment* installed in accordance with Section 507.3~~.

Reason: Where the heat and moisture loads from dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system, a Type II hood above is not needed. This “exception”, that is currently within Section 507.3, should be included with all the other exceptions for not requiring a hood in Section 507.1.
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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 1-3H.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides an alternative to the provision of Type II hoods for specific appliances. Not having to install a Type II hood will significantly lower material and labor costs however increasing the exhaust rate for some spaces could require slightly larger ventilation equipment or ductwork sizes in some situations. The larger ventilation equipment and ductwork might slightly increase costs but not as much as the cost savings for deletion of the hoods.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal passes as submitted based on the proponent reason statement. Where the heat and moisture loads from dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system, a Type II hood above is not needed. (Vote: 11-0)

Final Hearing Results

M46-21 AS

M47-21

Original Proposal

IMC: 507.1.3

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

2021 International Mechanical Code

Delete and substitute as follows:

~~**507.1.3 Fuel-burning appliances.** Where vented fuel-burning *appliances* are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the *appliance* vents.~~

507.1.3 Fuel-burning appliances. Appliances equipped with draft hoods or atmospheric burners shall not be located in the same room or space containing a Type I or Type II hood except where the appliance is located in a sealed enclosure equipped with a self-closing device with combustion air obtained from the outdoors or from other spaces in the building in accordance with Chapter 7 or the International Fuel Gas code.

Reason: It's an unfair competition for a draft hood appliance or an appliance with an open atmospheric burner to be located in a space with exhaust systems as large as that associated with commercial kitchens. It doesn't take much to overcome a gravity vent system. As little as 5 pascals can affect a vent system. Kitchens do not stay balanced very long as many things affect the dynamics over time often leading to negative pressures that can that can affect the gravity system. This can be a dangerous situation leading to combustion products spilling into the space. This language is the "provisions" the original section speaks of and will eliminate the subjectivity of this section by replacing it with mandatory language.

Cost Impact: The code change proposal will increase the cost of construction
This change could possibly increase cost if combustion air must be obtained from the outdoors where it might not have under the existing language.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted. It's an unfair competition for a draft hood appliance or an appliance with an open atmospheric burner to be located in a space with exhaust systems as large as that associated with commercial kitchens. Kitchens do not stay balanced very long as many things affect the dynamics over time often leading to negative pressures that can that can affect the gravity system. This can be a dangerous situation leading to combustion products spilling into the space. This language is the "provisions" the original section speaks of and will eliminate the subjectivity of this section by replacing it with mandatory language. (Vote:11-0)

Final Hearing Results

M47-21 AS

M49-21

Original Proposal

IMC: 508.1.1

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Delete and substitute as follows:

~~**508.1.1 Makeup air temperature.** The temperature differential between *makeup air* and the air in the conditioned space shall not exceed 10ºF (6ºC) except where the added heating and cooling loads of the *makeup air* do not exceed the capacity of the HVAC system~~.

508.1.1 Makeup air temperature. HVAC systems that serve the kitchen space shall have the additional capacity necessary for the latent and sensible loads that are introduced by the makeup air supplied to the kitchen space, or the makeup air shall be conditioned by dedicated systems such that the difference in temperature between the makeup air supplied to the kitchen space and the design setpoint temperature in the kitchen space is not greater than 10 degrees F (6 degrees C).

Exception: Makeup air supplied to a compensating hood shall not not be required to be conditioned.

Reason: This rewrite of the section intends to clarify the intent which was to either design the HVAC system for the kitchen to handle makeup air loads, or to have a dedicated makeup air conditioning system. It is also clarified that the 10 degree differential applies to the thermostat setpoint temperature in the kitchen, not the temperature of the kitchen as it happens to be at any given point in the day. If the HVAC system can handle the loads from makeup air, then the kitchen space temperature will reflect the thermostat setpoint. If a dedicated makeup air system is installed, then it must adhere to the delta 10 degree criterion. The exception recognizes that makeup air fed directly to the integral makeup air plenum of a hood or directly into the mouth of a hood need not be conditioned, since it might not affect the comfort of the employees.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 5.

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 **As Submitted**

Committee Reason: This proposal passed as submitted based on the proponent reason statement which intends to clarify the intent which was to either design the HVAC system for the kitchen to handle makeup air loads, or to have a dedicated makeup air conditioning system. It is also clarified that the 10 degree differential applies to the thermostat setpoint temperature in the kitchen, not the temperature of the kitchen as it happens to be at any given point in the day. If the HVAC system can handle the loads from makeup air, then the kitchen space temperature will reflect the thermostat setpoint. If a dedicated makeup air system is installed, then it must adhere to the delta 10 degree criterion. The exception recognizes that

makeup air fed directly to the integral makeup air plenum of a hood or directly into the mouth of a hood need not be conditioned, since it might not affect the comfort of the employees. (Vote: 11-0)

Final Hearing Results

M49-21 AS

M51-21

Original Proposal

IMC: 601.5

Proponents: Mike Moore, Stator LLC, Broan-NuTone (mmoore@statorllc.com)

2021 International Mechanical Code

Revise as follows:

601.5 Return air openings. Return air openings for heating, ventilation and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. Return air for heating or air-conditioning systems shall not be taken from a hazardous or insanitary location or a refrigeration room as defined in this code.
3. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
4. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer's installation instructions, ACCA Manual D or the design of the registered design professional.
5. Return air taken from one *dwelling unit* shall not be discharged into another *dwelling unit*.
6. Taking return air from a crawl space shall not be accomplished through a direct connection to the return side of a forced air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.
7. Return air for heating or air-conditioning systems shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.
8. Return air for heating or air-conditioning systems shall not be taken from indoor swimming pool enclosures and associated deck areas.

    Exceptions:

    1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2.
    2. Dedicated HVAC systems serving only such spaces.

Exceptions:

1. Taking return air for heating or air-conditioning systems from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
2. Taking return air for heating or air-conditioning systems from a kitchen is not prohibited in a *dwelling unit* where the kitchen and living spaces are in a single room and the cooking *appliance* is electric and located not less than 5 feet (1524 mm) in any direction from the return air intake opening.
3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason: The IMC defines return air as "Air removed from an approved conditioned space or location and recirculated or exhausted." The IMC defines exhaust air as "Air being removed from any space, appliance or piece of equipment and conveyed directly to the atmosphere by means of openings or ducts."

Based on these definitions, exhaust air may be considered as a subset of return air.

Section 601.5 establishes requirements for return air for "heating, ventilation, and air-conditioning systems" that are clearly not meant to apply to exhaust air from ventilation systems. For example, 601.5.7 requires that "Return air shall not be taken from a closet, bathroom,

toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic." Clearly, this section is not meant to prohibit taking exhaust air from kitchens, garages, bathrooms, etc., since exhaust of these spaces is required elsewhere in the code. This proposal is meant to clarify the intent of this section without changing its meaning.

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

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal clarifies the intent of this section without changing its meaning. Section 601.5 establishes requirements for return air for "heating, ventilation, and air-conditioning systems" that shall not be taken from a closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic. (Vote: 6-5)

Final Hearing Results

M51-21 AS

M53-21

Original Proposal

IMC: 601.5

Proponents: Craig Conner, self, self (craig.conner@mac.com); Joseph Lstiburek, Building Science Corporation, Myself (joe@buildingscience.com)

2021 International Mechanical Code

Revise as follows:

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 from a closet shall serve only the closet and shall not require a dedicated closet supply duct.

9.Return air taken from a closet smaller than 30 ft^2 (2.~~8~~ m^2) sh~~a~~ll require the closet door be undercut not less than$1^1/_2$ inc~~h~~es (38 mm), or be either a louvered door or include an air transfer grille both having a net free area of not less than 30 in^2 ~~-~~(19355 m^2~~)~~

~~8~~ 10. 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 (1524 mm) in any direction from the return air intake opening.
3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

Reason: Mold growth is now common in closets due to higher interior moisture loads and less heat gain in closets. Allowing a limited amount of return air provides a means of controlling closet moisture levels. Providing supply air to a closet exacerbates the problem by making closet surfaces colder.

This is one of six separate proposed changes related to controlling mold in closets, bathrooms and mechanical room. The six changes fix

problems caused by an increase in code thermal resistance over the past several code cycles.

For a more detailed explanation see:

https://www.buildingscience.com/documents/building-science-insights/bsi-109-how-changing-filters-led-condensation-and-mold-problem

Cost Impact: The code change proposal will increase the cost of construction
The code change proposal increases the cost of construction. The cost is the cost of adding the return duct. However, this*code change is not a requirement. It gives builders an option to solve and avoid problems.*

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal has passed as submitted based on the published proponent reason statement and the fact that these return openings are being sized so as to not produce negative pressure in the closet. (Vote: 10-1)

Final Hearing Results

M53-21 AS

M55-21

Original Proposal

IMC: 602.1, 602.1.1 (New), 602.1.2 (New), 602.1.3 (New), 602.2, 602.3, 602.2.1.4, 602.2.1.4.1, 602.2.1.4.2, 602.2.1, 602.2.1.1, 602.2.1.2, ~~602.2.1.3~~ , 602.2.1.5, 602.2.1.6, 602.2.1.7, 602.2.1.8, 602.3.10 (New)

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

~~602.1~~ General. Supply, return, exhaust, relief and ventilation air *plenums* shall be in accordance with this section. ~~limited to uninhabited crawl spaces,areas above a ceiling or below the floor, attic spaces, mechanical *equipment* rooms and the framing cavities addressed in Section 602.3. *Plenums* shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling *equipment*.~~ Fuel-fired *appliances* shall not be installed within a *plenum*.

Add new text as follows:

602.1.1 Locations limited. Plenums shall be limited to uninhabited crawl spaces, above a ceiling or below the floor, attic spaces, mechanical equipment rooms and the framing cavities addressed in Section 602.2.

602.1.2 Limited to a fire area. . Plenums shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling equipment.

602.1.3 Fuel fired appliances. . Fuel-fired appliances shall not be installed within a plenum.

Revise as follows:

602.2 Construction of plenums.. *Plenum* enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.3 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. Supply air *plenums* formed by gypsum boards shall not be incorporated in air-handling systems utilizing*direct evaporative cooling* systems.

~~602.3~~602.2.1 Stud cavity and joist space plenums. Stud wall cavities and the spaces between solid floor joists to be utilized as air *plenums* shall comply with the following conditions:

1. Such cavities or spaces shall not be utilized as a*plenum* for supply air.
2. Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.
3. Stud wall cavities shall not convey air from more than one floor level.
4. Stud wall cavities and joist space*plenums* shall comply with the floor penetration protection requirements of the*International Building Code*.
5. Stud wall cavities and joist space*plenums* shall be isolated from adjacent concealed spaces by*approved* fireblocking as required in the *International Building Code*.
6. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air*plenums*.

Delete without substitution:

~~**602.2.1.4 Electrical equipment in plenums.** Electrical *equipment* exposed within a *plenum* shall comply with Sections 602.2.1.4.1 and 602.2.1.4.2.~~

~~**602.2.1.4.1 Equipment in metallic enclosures.** Electrical *equipment* with metallic enclosures exposed within a *plenum* shall be permitted.~~

~~**602.2.1.4.2 Equipment in combustible enclosures.** Electrical *equipment* with combustible enclosures exposed within a *plenum* shall be *listed* and *labeled* for such use in accordance with UL 2043.~~

Revise as follows:

~~**602.2.1**~~ **602.3 Materials within plenums.** ~~Except as required by Sections 602.2.1.1 through 602.2.1.8, m~~Materials within *plenums* shall be noncombustible or shall be in compliance with the applicable requirements in Sections 602.3.1 through 602.3.10. ~~*listed* and *labeled* as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.~~

Exceptions~~:~~: This section shall not apply to the following:

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603.~~Materials exposed within plenums in one- and two-family dwellings.
2. ~~Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~ Combustible materials fully enclosed within one of the following:
3. ~~This section shall not apply to materials exposed within *plenums* in one- and two-family dwellings.~~
4. ~~This section shall not apply to smoke detectors.~~
5. ~~Combustible materials fully enclosed within one of the following~~:
   5.1. 2.1 Continuous noncombustible raceways or enclosures.
   5.2. 2.2 Approved gypsum board assemblies.
   5.3. 2.3 Materials *listed* and *labeled* for installation within a *plenum* and listed for the application.
6. 3. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

~~**602.2.1.1**~~ **602.3.3 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with NFPA 262, or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.5, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways.

~~**602.2.1.2**~~ **602.3.4 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall be *listed* and *labeled* as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.

~~**602.2.1.3**~~ **602.3.5 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 1820.

~~**602.2.1.5**~~ **602.3.6 Discrete electrical, plumbing and mechanical products in plenums.**Where discrete electrical, plumbing and mechanical products and appurtenances are located in a *plenum* and have exposed combustible material, they shall be*listed* and *labeled* for such use in accordance with UL 2043.
Exception: Electrical equipment with metallic enclosures exposed within a plenum.

~~602.2.1.6~~ **602.3.7 Foam plastic in plenums as interior finish or interior trim.** Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, and shall be tested in accordance with NFPA 286 and meet the acceptance criteria of Section 803.1.2 of the International Building Code. As an alternative to testing to NFPA 286, the foam plastic shall be approved based on tests conducted in accordance with Section 2603.9 of the International Building Code.

Exceptions:

1. Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the *plenum* by a thermal barrier complying with Section 2603.4 of the International Building Code.
2. Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim, shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the *plenum* by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm).
3. Foam plastic in *plenums* used as interior wall or ceiling finish or interior trim, shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the *plenum* by not less than a 1-inch (25 mm) thickness of masonry or concrete.

~~602.2.1.7~~ **602.3.8 Plastic plumbing piping and tubing.** Plastic piping and tubing used in plumbing systems shall be *listed* and *labeled* as having a flame spread index not greater than 25 and a smoke-developed index not greater than 50 when tested in accordance with ASTM E84 or UL 723.

Exception: Plastic water distribution piping and tubing *listed* and *labeled* in accordance with UL 2846 as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm), and installed in accordance with its listing.

~~602.2.1.8~~ **602.3.9 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 indices 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~~ 602.3.9.

Add new text as follows:

602.3.10 Other combustible materials. Other combustible materials not covered by Section 602.3 shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

Reason: The intent of this code proposal is to provide clarity as to what various materials are permitted within a plenum under specific conditions. The current Sections 602.2 and 602.3 are requirements for the constructing the plenum, and thus the current Section 602.3 should be a subsection of Section 602.2. Section 602.2.1 and its subsections are not for the construction of the plenum, but what materials are permitted within the plenum, and thus should not be a subsection of Section 602.2.
Section 602 is reformatted to provide clarity as to four aspects regarding plenums –

- 602.1 – General requirements – provides the charging language for plenums, with the scope and limitations of where plenums are permitted to be used.
- 602.2 – Construction of the plenum – provides the requirements for the construction of the plenum.
- 602.3 – Materials within the plenum – provides the requirements for materials that are permitted to be within the plenum, but are not required for the plenum to function, or are part of the construction of the plenum

“Construction” of the plenums is currently covered in both Section 602.2 (but not its subsections) and 602.3. Thus, the current Section 602.3 should be a subsection of Section 602.2. Section 602.2.1 and its subsections are not for the construction of the plenum, but what materials are permitted within the plenum, and thus should not be a subsection of Section 602.2.

“Materials permitted within” (Section 602.2.1 and following subsections) is currently written as several exceptions for a number of different materials. Reorganizing this section provides a straightforward list of requirements for specific materials, while retaining “the effect of applying” all the original requirements.

The following is the outline of proposed reorganization for the materials permitted within the plenum:

Section does not apply to (original exceptions):

1. Materials in one and two family dwellings
1. Combustible materials fully enclosed
1. Materials in Group H, Division 5

Section does apply to (combustible materials that are permitted within the plenum, under specific conditions):

1. Ducts, connectors, linings, and tapes – IMC Sections 603 and 604
1. Smoke detectors and sampling tubes – UL 268
1. Wiring – NFPA 262 or UL 2024
1. Nonmetallic sprinkler pipe – UL 1887
1. Pneumatic tubing – UL 1820
1. Discrete electrical, plumbing, and mechanical devices – UL 2043
1. Foam plastic insulation – ASTM E84/UL 723 or NFPA 286
1. Plastic plumbing pipe – ASTM E84/UL 723 or UL 2846
1. Pipe and duct insulation – ASTM E84/UL 723 with ASTM E2231
1. Any other combustible materials – ASTM E84/UL 723

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is purely editorial for the purposes of clarifying existing requirements by better organizing the text. Material or labor to comply with the requirements are not different and as such, there is no to impact on the cost of construction.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
Add new text as follows:

602.3.1 Ducts, connectors, duct coverings, linings, and tape. .
Rigid and flexible ducts and connectors shall conform to Section 603. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.

602.3.2 Smoke detectors. .
Smoke detectors shall be listed and labeled.

Committee Reason: The committee agreed that the proposed provides clarity as to what various materials are permitted within a plenum under specific conditions. The current Sections 602.2 and 602.3 are requirements for the constructing the plenum, and thus the current Section 602.3 should be a subsection of Section 602.2. Section 602.2.1 and its subsections are not for the construction of the plenum, but what materials are permitted within the plenum, and thus should not be a subsection of Section 602.2. The modification brings in language that was originally intended to be part of the submittal. (Vote: 11-0)

Final Hearing Results

M55-21 AM

M60-21

Original Proposal

IMC: 604.3

Proponents: Cory Wasniewski, Roberts Environmental Control Corp, Roberts Environmental Control Corp (CJW@RobertsHVAC.com)

2021 International Mechanical Code

Revise as follows:

604.3 Coverings and linings. Duct coverings ~~and linings~~, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than ~~50~~450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. ~~Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C).~~ Coverings shall be *listed* and *labeled*.

Duct 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). Linings shall be *listed* and *labeled*.

~~Exception~~ Exceptions:

1. Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawl spaces shall be subject to all of the following requirements:
   1. 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.
2. Ductwork coverings and linings, including adhesives where used, located in a plenum rated cavity, 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*.

Reason: ***Specific to ductwork insulation coverings not in Plenum-Rated Spaces.***

1. Ductwork coverings both indoors and outdoors, not located within a plenum rated space, are not in the air stream. They are in the same building space as all other construction materials.
2. Weatherproof and protective barriers that are atop of ductwork coverings (insulations) are required per section IMC 603.16, however, per IMC Sections 604.12 these barriers are not classified for a required flame and smoke index rating. This forces you to reference back to the IBC and NFPA 90A, allowing IBC Class A which defines a flame and smoke rating as ASTM E84 **25/450** equal to everything else in the building.
   1. *IBC allows all building insulation products, materials, and facings, again outside of a plenum-rated cavity, in its highest classification (Class A, I) to have an ASTM E84 rating of* ***25/450.*** *With the ONLY exception being materials*

within a plenum rated cavity.

2. *NFPA 90A Section 4.3.3.1.2 Specifically states the flame spread and smoke-developed index requirements of section 4.3.3.1.1 shall NOT apply to air duct weatherproof coverings where they are located entirely outside of a building, do not penetrate a wall or roof, and do not create an exposure hazard.*

3. There is a direct conflict of the NFPA 90A Section 4.3.3.1.2 allowing weather covering directly atop of the ductwork covering to meet ASTM E84 25/**450.** But then per IMC 604.3 not allowing the covering itself to meet the same specifications of ASTM E84 25**4/50**. The covering and the weatherproof barrier would become the same assembly but then have conflicting requirements.
4. There is a conflict of the IBC allowing all interior and exterior to the building materials (with the only exception being materials within a plenum space) to meet the IBC Class A, I specification of ASTM E84 **25/450**. But the IMC section 604.3 ductwork coverings, that are in the same building space, do not follow the same NFPA and IBC specifications.

Bibliography:

- IBC
- IMC
- NFPA 90A

Cost Impact: The code change proposal will decrease the cost of construction

- Closed Cell (polyisocyanurates) foams that meet IBC Class A/I and NFPA specifications (ASTM E84**25/450**) for use in ductwork coverings would reduce costs and improve energy efficiencies.
- Closed Cell (polyisocyanurates) foams have some of the highest R-values per inch and the lowest costs in the current markets when compared to other board insulations.
- Closed Cell (polyisocyanurates) foams are Green Building, GreenGuard, and LEED qualified building materials.
- Closed Cell (polyisocyanurates) foams when compared to equivalent R-Value Fiber Board insulations are not only more cost-effective, they have a 50% or more reduced weight load.
- Achieving a R-6.5 @ 1", R-9.8 @ 1.5", R-13.1 @ 2"
- Closed Cell (polyisocyanurates) foams weigh significantly less leading to installation cost savings.
- Closed Cell (polyisocyanurates) foams meet equivalent R-Values to FIber Board are 50% thickness. Saving space, time, and efficiency during construction.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
Revise as follows:

604.3Coverings and linings.
Duct coverings and linings, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than ~~450~~ 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 ~~Linings~~ shall be listed and labeled.
~~Duct 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). Linings shall be *listed* and *labeled*.~~

Exceptions:

1. Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawl spaces shall be subject to all of the following requirements:
    1. 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.

2. ~~Ductwork~~ Duct coverings added to the outside of ducts and not contained in plenums~~and linings~~, including adhesives where used, ~~located in a plenum-rated cavity~~, shall have a flame spread index not more than 25 and a smoke-developed index not more than 450 ~~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*.

Committee Reason: This is necessary for fire safety in duct coverings, linings and plenums. Coverings that are not plenums are treated like other building materials. The modification appropriately places the allowance for the higher smoke development (450) in the exception and the lower smoke development (50) in the base requirement. (Vote: 10-1)

Final Hearing Results

M60-21 AM

M61-21

Original Proposal

IMC: SECTION 912, 912.1, 912.3, 912.2, UL Chapter 15 (New)

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

2021 International Mechanical Code

Revise as follows:

SECTION 912
~~INFRARED RADIANT~~ ELECTRIC SPACE HEATERS

912.1 General. Permanently installed electric i~~nfrared radiant~~ space heaters shall ~~comply~~ be listed and labeled in accordance with ~~UL 499~~ UL 2021, and installed in accordance with the manufacturer's instructions.

912.3 Clearances. Heaters shall be installed with *clearances* from combustible material in accordance with the manufacturer's installation instructions.

Revise as follows:

912.2 Support. ~~Infrared radiant~~ Electric space heaters shall be fixed in a position independent of~~fuel and~~ electric supply lines. Hangers and brackets shall be noncombustible material.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

UL 2021-15 Fixed and Location-Dedicated Electric Room Heaters (with revisions through December 14, 2016)

Reason: UL 499 is a general heating appliance and equipment standard, whereas UL 2021 is specifically for electric space heaters that are fixed in place and dedicated to a room. Infrared is a technology, not an application. There are other means for providing the heat. The reference to fuel lines is removed from Section 912.2, because the fuel-fired infrared heaters are covered in Section 630 of the IFGC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarifies the use of the standards to list these types of heaters.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was passed as submitted because it references appropriate standards and electrical components. (Vote: 10-0)

Final Hearing Results

M62-21

Original Proposal

IMC: SECTION 202 (New), SECTION 931 (New), 931.1 (New)

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

2021 International Mechanical Code

Add new definition as follows:

STEAM BATH EQUIPMENT

.

Includes steam bath generators, combination room and steam generator systems, and steam bath cabinets intended for high-humidity concentrated heating at elevated temperatures for personal bathing

Add new text as follows:

SECTION 931
STEAM BATH EQUIPMENT

931.1 General. Steam bath equipment shall be *listed* and *labeled* in accordance with UL 499 and shall be installed in accordance with their listing and the manufacturer's instructions.

Reason: This proposal provides introduces requirements for steam bath equipment listings, and installation criteria. This section is being proposed since steam bath equipment is acting as a boiler and not a water heater and therefore should be located in the IMC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not require the installation of steam bath equipment, but provides requirements where installed.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was approved as submitted because it adds an appropriate definition for steam bath equipment and the appropriate UL standard for equipment being referenced. (Vote: 10-0)

Final Hearing Results

M62-21 AS

M63-21

Original Proposal

IMC: 1001.1

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

2021 International Mechanical Code

Revise as follows:

1001.1 Scope. This chapter shall govern the installation,*alteration* and repair of boilers, water heaters and pressure vessels.

Exceptions:

1. Pressure vessels used for unheated water supply.
2. Portable unfired pressure vessels and Interstate Commerce Commission containers.
3. Containers for bulk oxygen and medical gas.
4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m^3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within *occupancies* of Groups B, F, H, M, R, S and U.
5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.
6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems.
7. Any boiler or pressure vessel subject to inspection by federal or state inspectors.
8. Pressure vessels used in specific appliances and equipment that are regulated by Chapter 9 of this code.

Reason: The specific appliances and equipment that are regulated by Chapter 9 of the IMC have specific requirements within the referenced standards that address any pressure vessels or parts subject to pressure within those appliances and equipment. This aligns with the Exception 5 in this section.
The applicable referenced standards in Chapter 9 that address the requirements for Pressure Vessels and Parts Subject to Pressure are UL 197 (Section 41), UL 499 (Section 30), UL 1261 (Section 6), UL 1995 (Section 34), and UL 60335-2-40 (Section 22).

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The requirements for pressure vessels are already covered with the referenced standards for the specific appliances and equipment regulated by Chapter 9.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was passed as submitted because the reference to pressure vessel requirements in Chapter 9 of the code is appropriate. (Vote: 10-0)

Final Hearing Results

M63-21 AS

M64-21

Original Proposal

IMC: 1002.4 (New)

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

2021 International Mechanical Code

Add new text as follows:

1002.4 Water heater pan required. Where a storage type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan constructed by one of the following:

1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6010 mm) in thickness.
2. Plastic of not less than 0,036 inch (0.9 mm) in thickness.
3. Other approved materials.
4. A plastic pan installed beneath a water heater shall be constructed of material having a flame spread index of 25 or less and a smoked developed index of 450 or less when tested in accordance with ASTM E-84 or UL-723

Reason: REASON: This language will make the IMC consistent with the IPC, IRC and IFGC regardless of the fuel or energy source. Water heaters are notorious for leaking at some point. The IMC is silent on this matter.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature and is for consistency reasons only. There are no new requirements.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
Revise as follows:

1002.4Water heater pan required.
Where a storage type water heater or a hot water storage tank is installed in a location where water leakage from the tank will cause damage, the tank shall be installed in a pan constructed by one of the following:

1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6010 mm) in thickness.
2. Plastic of not less than 0,036 inch (0.9 mm) in thickness constructed of material having a flame spread index of 25 or less and a smoked developed index of 450 or less when tested in accordance with ASTM E-84 or UL-723
3. Other approved materials.
4. ~~A plastic pan installed beneath a water heater shall be constructed of material having a flame spread index of 25 or less and a smoked developed index of 450 or less when tested in accordance with ASTM E-84 or UL-723~~

Committee Reason: Good change on water heater pan, aligning what exists currently in IPC Section 504.7. The modification appropriately combines 2 requirements into 1 for simplification. (Vote: 11-0)

Final Hearing Results

M64-21 AM

M65-21

Original Proposal

IMC: 1006.6

Proponents: Chris Haldiman, Watts Water Technologies, Watts Water Technologies (chris.haldiman@wattswater.com)

2021 International Mechanical Code

Revise as follows:

1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is *approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the *appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or *equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. ~~Discharge to a termination point that is readily observable by the building occupants.~~Where the discharge termination point is not readily observable, discharge monitoring is required.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 of the *International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

Reason: Continuous low-level discharge (“dribble”) of T&P valve due to over-pressure (failed expansion tank, lack of secondary pressure relief device for thermal expansion, etc.) with hard water conditions can cause build-up of scale in the relief valve discharge port. Such obstruction of discharge port can compromise the relieving capacity of the valve and pose a safety risk to building occupants. Remote monitoring of relief valve discharge will ensure that the condition is immediately known.

Cost Impact: The code change proposal will increase the cost of construction
If the discharge piping is not readily visible this addition will increase the cost of construction but will also provide added safety for the occupants.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

1006.6Safety and relief valve discharge.

Safety and relief valve discharge pipes shall be of rigid pipe that is*approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the*appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or*equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily visible and observable by the building occupants. If the discharge termination point is not readily visible and observable, a device for leak detection monitoring with alarm notification (and not automatic shut-off) is required.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 of the*International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

Committee Reason: The committee agreed that this proposal provides clarity to the requirements for safety and relief valves. The modification further clarifies that language. (Vote:11-0)

Final Hearing Results

M65-21 AM

M66-21 Part I

Original Proposal

IMC: 1006.6

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (PMGCAC@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is*approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the*appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or*equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. ~~Not terminate~~ Terminate not more than 6 inches (152 mm) and not less than two times the discharge pipe diameter above the floor or flood level rim of the waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 of the*International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

Reason: Part I REASONING: The text for the requirements for a discharge pipe from any pressure (or temperature) relief valve should be identical between all the codes that have such requirements. It doesn't matter what the relief valve is protecting. Uniformity across the codes on these requirements will improve compliance.
PART II REASONING: Oddly, Section M2002.4 has minimal requirements for pressure relief valve discharge pipes. A boiler doesn't "know" what type of building it is located in. The requirements for a pressure relief valve discharge pipe should be identical to what is in the IMC for the same application. Uniformity across the codes on these requirements will improve compliance.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee

meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 31.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The relief valve piping already has to be installed and if relief valve manufacturers' instructions are being followed, many of these requirements are already being followed.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

1006.6Safety and relief valve discharge.
Safety and relief valve discharge pipes shall be of rigid pipe that is*approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the*appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or*equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Terminate not more than 6 inches (152 mm) ~~and not less than two times the discharge pipe diameter~~ above the floor or flood level rim of the waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 of the *International Plumbing Code* or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

Committee Reason: The committee agreed that the text for the requirements for a discharge pipe from any pressure (or temperature) relief valve should be identical between all the codes that have such requirements. It doesn't matter what the relief valve is protecting. Uniformity across the codes on these requirements will improve compliance. The modification further clarifies acceptable industry practices. (Vote: 11-0)

Final Hearing Results

M66-21 Part I AM

M66-21 Part II

Original Proposal

IRC: M2002.4, M2002.4.1 (New)

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (pmgcac@iccsafe.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Residential Code

Revise as follows:

M2002.4 Pressure relief valve. Boilers shall be equipped with pressure relief valves with minimum rated capacities for the equipment served. Pressure relief valves shall be set at the maximum rating of the boiler. ~~Discharge shall be piped to drains by gravity to within 18 inches (457 mm) of the floor or to an open receptor.~~

M2002.4.1 Requirements for discharge pipe. . The discharge piping serving a pressure relief valve, temperature relief valve or combination valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the boiler.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed to flow by gravity.
10. Terminate not more than 6 inches (152 mm) and not less than two times the discharge pipe diameter above the floor or waste receptor flood level rim.
11. Not have a threaded connection at the end of the piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
14. Be one nominal size larger than the size of the relief-valve outlet, where the relief-valve discharge piping is installed with insert fittings. The outlet end of such tubing shall be fastened in place.
15. The end of the discharge pipe shall be cut at a 45-degree angle.

Reason: Part I REASONING: The text for the requirements for a discharge pipe from any pressure (or temperature) relief valve should be identical between all the codes that have such requirements. It doesn't matter what the relief valve is protecting. Uniformity across the codes on these requirements will improve compliance.
PART II REASONING: Oddly, Section M2002.4 has minimal requirements for pressure relief valve discharge pipes. A boiler doesn't "know" what type of building it is located in. The requirements for a pressure relief valve discharge pipe should be identical to what is in the IMC for

the same application. Uniformity across the codes on these requirements will improve compliance.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 31.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The relief valve piping already has to be installed and if relief valve manufacturers' instructions are being followed, many of these requirements are already being followed.

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: The air gap verses the air break is confusing. It doesn't make sense that the boiler relief valve discharges to a water heater pan. (10-1)

Public Comments

Public Comment 1

Proponents: Pennie Feehan, Chair of PMGCAC, Chair of PMGCAC (pmgcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Residential Code

M2002.4.1 Requirements for discharge pipe. . The discharge piping serving a pressure relief valve, temperature relief valve or combination valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air ~~gap located gap~~break located in the same room as the boiler.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air~~gap. gap~~break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the ~~water heater~~ boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed to flow by gravity.

10. Terminate not more than 6 inches (152 mm) ~~and not less than two times the discharge pipe diameter~~ above the floor or waste receptor flood level rim.
11. Not have a threaded connection at the end of the piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
14. ~~Be one nominal size larger than the size of the relief valve outlet, where the relief valve discharge piping is installed with insert~~ fittings. ~~The outlet end of such tubing shall be fastened in place.~~
15. ~~The end of the discharge pipe shall be cut at a 45-degree angle.~~

Commenter's Reason: This public comment corrects Committee identified problems and also makes small changes to correlate the text with Part I of this proposal, As Modified.

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction This public comment is only a clarification of the original proposal.

Final Hearing Results

M66-21 Part II AMPC1

M67-21

Original Proposal

IMC: 1006.6

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

2021 International Mechanical Code

Revise as follows:

1006.6 Safety and relief valve discharge. Safety and relief valve discharge pipes shall be of rigid pipe that is *approved* for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the*appliance*.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.
4. Serve a single relief device and shall not connect to piping serving any other relief device or*equipment*.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. ~~Be constructed of those materials listed in Section 605.4 of the~~*International Plumbing Code* ~~or materials tested, rated and approved for such use in accordance with ASME A112.4.1.~~ Utilize piping material complying with Section 1202.

Reason: It is inappropriate to reference the Plumbing Code potable water piping section to regulate the piping material for boiler relief valves. The appropriate reference is to the hydronic piping section in the Mechanical Code. One of the differences is the allowance of black steel pipe. Prior to the change made during the last cycle, black steel pipe was always permitted to be used for a relief valve discharge pipe. This material has been used on boilers for relief valve discharge for many years. No problem were presented during the last cycle whereby black steel pipe did not properly perform as a discharge pipe for a relief valve. There were only perceptions that galvanized steel pipe should be used rather than black steel pipe. Section 1202, referenced in the new text, is the hydronic piping material section.

Cost Impact: The code change proposal will decrease the cost of construction
Black steel pipe costs less than galvanized steel pipe. Hence, the allowance of black steel pipe will lower the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was passed as submitted because it will appropriately allow use of black pipe for hydronic

equipment. (Vote: 11-0)

Final Hearing Results

M67-21 AS

M68-21

Original Proposal

IMC: 1101.1, 1101.6, SECTION 202

Proponents: Jeffrey Shapiro, International Code Consultants, Self (jeff.shapiro@intlcodeconsultants.com)

2021 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~~. Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

1101.6 Maintenance. ~~Mechanical r~~Refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.

Delete without substitution:

~~**REFRIGERATION SYSTEM, MECHANICAL.** A combination of interconnected refrigeration-containing parts constituting one closed refrigerant circuit in which a refrigerant is circulated for the purpose of extracting heat and in which a compressor is used for compressing the refrigerant vapor.~~

Reason: Changes are intended for clarity and simplification. The scope of Chapter 11 needn't repeat what is already in the definition of "refrigeration/refrigerating system" and includes the concept of fluid phase change. This recommendation is consistent with revised definitions related to refrigeration submitted by PMGCAC, but was not picked up in time for PMGCAC to address the revision in their changes.

In addition, following PMGCAC's work on the topic, I noticed that the term "refrigeration system, mechanical" contains an inaccuracy related to only being a single circuit, but rather than fixing that, it made more sense to simply delete the definition. The term is only used once in the code (1101.6), and it really doesn't belong there as a limitation. All refrigeration systems, whether mechanical, absorption, or whatever, should be properly maintained per the requirements in 1101.6.

Although I represent IIAR on some issues related to refrigeration systems, this proposal is submitted on my own behalf. It does not impact IIAR and IIAR had no input to this submittal.

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

This proposal has no connection to construction, so there is no construction cost impact.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was passed as submitted because the definition is no longer needed based on previous committee actions. (Vote: 11-0)

Final Hearing Results

M69-21

Original Proposal

IMC: 1101.1.1, IIAR Chapter 15 (New)

Proponents: Jeffrey Shapiro, International Code Consultants, IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

1101.1.1 Refrigerants other than ammonia. Refrigerant piping design and installation for systems containing a refrigerant other than ammonia, including pressure vessels and pressure relief devices, shall comply with this chapter and ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with BSR/IIAR CO2.

Add new standard(s) as follows:

IIAR

International Institute of Ammonia Refrigeration
1001 N. Fairfax Street, Suite 503
Arlington, VA 22314

BSR/IIAR CO2-2021 Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Reason: BSR/IIAR CO2 is in the process of completion for issuance in 2021. It is a new standard governing refrigeration systems that use carbon dioxide as the refrigerant, and it is designed to be a companion to ASHRAE 15, providing additional design requirements that are unique to carbon dioxide systems to supplement ASHRAE 15 and going beyond the scope of ASHRAE 15 by regulating the complete life-cycle of carbon dioxide systems. Carbon dioxide has become increasingly popular as an industrial refrigerant because it is considered efficient and climate friendly. Including IIAR's new standard will assure that these systems are properly regulated.

Cost Impact: The code change proposal will increase the cost of construction
The new standard includes requirements that reflect industry good practice but are not currently mandatory. By including the standard as a mandatory reference standard in the IMC, following industry good practice will no longer be optional for carbon dioxide systems.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

1101.1.1Refrigerants other than ammonia.
Refrigerant piping design and installation for systems containing a refrigerant other than ammonia, including pressure vessels and pressure relief devices, shall comply with this chapter and ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with ~~BSR/~~IIAR CO2.

ANSI~~BSR~~/IIAR CO2-2021	Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

Committee Reason: The committee agreed that the proposal appropriately adds a new standard that governs refrigeration and based on the proponent reason statement. The modification simply clarifies the acronym of the new standard. (Vote: 11-0)

Final Hearing Results

M69-21 AM

M70-21

Original Proposal

IMC: 1101.1.2, IIAR Chapter 15 (New)

Proponents: Jeffrey Shapiro, International Code Consultants, IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 International Mechanical Code

Revise as follows:

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 IIAR 6 and shall not be required to comply with this chapter.

Add new standard(s) as follows:

IIAR

International Institute of Ammonia Refrigeration
1001 N. Fairfax Street, Suite 503
Arlington, VA 22314

ANSI/IIAR 6-2019 Standard for Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems

Reason: IIAR 6 is a new standard covering inspection, testing and maintenance of closed-circuit ammonia refrigeration systems and is part of the suite of IIAR standards regulating ammonia refrigeration systems referenced by the IFC and IMC. Because this standard addresses system maintenance, which is part of the IMC scope in Section 101.2, it is important to have the standard referenced by the IMC. It adds mandatory system maintenance regulations covering ammonia refrigeration to the IMC to help assure safe operation of these systems and provides inspectors with a needed tool for ensuring compliance.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed standard is scoped to inspection, testing and maintenance and does not impact construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was passed as submitted because by adopting this standard it allows for evaluation of older systems and makes sure all components have been looked at. (Vote: 11-0)

Final Hearing Results

M70-21 AS

M71-21

Original Proposal

IMC: 1101.2, TABLE 1101.2

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

2021 International Mechanical Code

1101.2 Factory-built equipment and appliances. *Listed* and *labeled* self-contained, factory-built *equipment* and *appliances* shall be tested in accordance with the applicable standards specified in Table 1101.2. 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.

Revise as follows:

TABLE 1101.2 FACTORY-BUILT EQUIPMENT AND APPLIANCES

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 and heat pumps	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

Reason: This table was added during the last cycle at the same time that the refrigerant piping rewrite was added. This resulted in refrigerant fitting requirements appearing in two locations. The appropriate location for referencing fitting requirements in in Section 1107. It should be noted that UL 207 is included in 1107.5. By deleting this row, it avoids confusion in which section applies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature. As such, it has no impact on the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal has passed as submitted because it corrects UL standards removed from table for fittings as they currently exist, and are more appropriate in Section 1107. Further, the applicable portions of UL107 are now contained in UL207 that is referenced in Section 1107.5. (Vote: 11-0)

Final Hearing Results

M71-21 AS

M72-21

Original Proposal

IMC: 1101.2.1 (New), UL Chapter 15

Proponents: Helen Walter-Terrinoni, AHRI, AHRI; Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., Daikin US (JBENGINEER@aol.com); Andrew Klein, A S Klein Engineering, The Chemours Company (andrew@asklein.com); Joe Nebbia, Newport Partners, Natural Resources Defense Council (jnebbia@newportpartnersllc.com)

2021 International Mechanical Code

Add new text as follows:

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

Revise as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

UL/CSA 60335-2-40—~~17~~2019 Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

Reason: During the last code cycle, Table 1101.2 was added to reference all of the appropriate standard for factory-built equipment. Included in the list are standards that regulate the use of Group A2L, A2, A3, and B1 refrigerants. However, that is not separated out in the table. To assist the code official, this new section will add the appropriate reference to the standards that regulate equipment using these refrigerant in high probability systems. The application of these refrigerants include the use of Group A2L in equipment providing human comfort. Group A2l, A2, A3, and B1 refrigerants are also used in high probability equipment such as water coolers, refrigeration equipment in supermarkets, and freezers and cooler in restaurants and similar facilities. There are strict limitation on the charge size of these refrigerants specified in the standards referenced.

The reference to ASHRAE 15-2019 opened the code to the use of Group A2L refrigerants in high probability systems for human comfort. ASHRAE 15 has since added specific reference to the standards regulating equipment using Group A2L refrigerants. Thus, this proposal is consistent with the requirements in the addendums to ASHRAE 15.The 2019 edition of UL/CSA 60335-2-40 added additional safety requirements for equipment using Group A2L, A2, A3, and B1 refrigerants.
The update to the 2019 edition of UL/CSA 60335-2-40 includes additional safety requirements. This edition added electrical and refrigerant safety requirements. There are provisions for refrigerant detection systems, UL-C germicidal lamp systems, CO2 systems, photovoltaic systems and new marking requirements. With the increased use of Group A2L A2, and A3 refrigerants, it is important to reference the latest edition of the standard.

NRDC Reason:

By adding a requirement for A2L, A2, A3, and B1 to comply with UL 484, UL/CSA 60335-2-40 or UL/CSA 60335-2-89, the code will clarify for the user what safety standards should be used for equipment with these refrigerants. The proposed update of referenced standard UL 484, UL/CSA 60335-2-40 to the 2019 version provides new safety measures for equipment using the A2L refrigerant class, which were not separately addressed in earlier versions of the standard. These changes are especially important in the case of A2L refrigerants, which are expected to increase in use as a substitute for hydrofluorocarbon (HFC) refrigerants. HFCs are extremely potent greenhouse gases and in December 2020 the U.S. Congress passed a new law that will require an 85% economy-wide phasedown of HFC refrigerants over the next 15 years. The phasedown is expected to avoid HFC emissions of 900 million metric tons of CO2-equivalent by 2035. In addition, 9 states - 8 of which adopt the ICC codes - have already prohibited the use of HFC refrigerants in several high volume applications.1 Human comfort systems account for more HFC use than any other end-use application in the U.S., so a large portion of the HFC reductions are expected

to come from them. A2L refrigerants have significantly lower global warming potential than A1-class HFCs, so A2L use is a key part of the HFC reduction plan. These restrictions on the supply of HFC refrigerant will drive up consumption of A2L substitutes. Permitting use of alternative refrigerants, including A2L refrigerants, in high probability systems for human comfort will enable states and local jurisdictions to meet their heating and cooling needs while also complying with applicable HFC regulations. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. This change allows the ICC to provide an off the shelf solution to those jurisdictions.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is a clarification of the requirements for listing factory-built equipment. Therefore, there is no increase or decrease in the cost of construction. The code user still has the option as to what type of refrigeration equipment to install.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted based on the proponents reason statement. By adding a requirement for A2L, A2, A3, and B1 to comply with UL 484, UL/CSA 60335-2-40 or UL/CSA 60335-2-89, the code will clarify for the user what safety standards should be used for equipment with these refrigerants. The proposed update of referenced standard UL 484, UL/CSA 60335-2-40 to the 2019 version provides new safety measures for equipment using the A2L refrigerant class, which were not separately addressed in earlier versions of the standard. These changes are especially important in the case of A2L refrigerants, which are expected to increase in use as a substitute for hydrofluorocarbon (HFC) refrigerants. HFCs are extremely potent greenhouse gases and in December 2020 the U.S. Congress passed a new law that will require an 85% economy-wide phasedown of HFC refrigerants over the next 15 years. The phasedown is expected to avoid HFC emissions of 900 million metric tons of CO2-equivalent by 2035. In addition, 9 states - 8 of which adopt the ICC codes - have already prohibited the use of HFC refrigerants in several high volume applications.1 Human comfort systems account for more HFC use than any other end-use application in the U.S., so a large portion of the HFC reductions are expected to come from them. A2L refrigerants have significantly lower global warming potential than A1-class HFCs, so A2L use is a key part of the HFC reduction plan. These restrictions on the supply of HFC refrigerant will drive up consumption of A2L substitutes. Permitting use of alternative refrigerants, including A2L refrigerants, in high probability systems for human comfort will enable states and local jurisdictions to meet their heating and cooling needs while also complying with applicable HFC regulations. Without this change, jurisdictions adopting the code will be forced to enact their own amendments to the code in order to support their HFC reduction goals. (Vote: 10-0)

Final Hearing Results

M72-21 AS

M73-21

Original Proposal

IMC: SECTION 202 (New), 1101.7, 1102.2.1

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Add new definition as follows:

Refrigerant Designation. The unique identifying alphanumeric value or refrigerant number assigned to an individual refrigerant and published in ASHRAE Standard 34.

Delete and substitute as follows:

~~**1101.7 Change in refrigerant type.** The type of refrigerant in refrigeration systems having a refrigerant circuit containing more than 220 pounds (99.8 kg) of Group A1 or 30 pounds (13.6 kg) of any other group refrigerant shall not be changed without prior notification to the code official and compliance with the applicable code provisions for the new refrigerant type.~~

1101.7 Changing Refrigerant. Changes of refrigerant in an existing system to a refrigerant with a different refrigerant designation shall only be allowed where in accordance with the following:

1. The change of refrigerant shall be approved by the owner.
2. The change in refrigerant shall be in accordance with one of the following.
   2.1 Written instructions of the original equipment manufacturer.
   2.2 An evaluation of the system by a registered design professional or by an approved agency that validates safety and suitability of the replacement refrigerant.
   2.3 Approved by the code official.
3. Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply.
4. Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this standard for a new installation, and the change of refrigerant shall require code official approval.

~~**1102.2.1 Mixing.** Refrigerants, including refrigerant blends, with different designations in ASHRAE 34 shall not be mixed in a system.~~

~~**Exception:** Addition of a second refrigerant is allowed where permitted by the *equipment* or *appliance* manufacturer to improve oil return at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer's instructions.~~

1102.2.1 Mixing.

Refrigerants with different refrigerant designations shall only be mixed in a system in accordance with both of the following:

1. The addition of a second refrigerant is allowed by the equipment manufacturer and is in accordance with the manufacturer's written instructions.
2. The resulting mixture does not change the refrigerant safety group.

Reason: With the onset of flammable refrigerants, the need to address change of refrigerant from one safety class to another was identified. ASHRAE published addendum e to ASHRAE 15-2016 to address this concern (which is now part of the ASHRAE 15-2019

version, Section 5.3).

Bibliography: 1. ANSI/ASHRAE 15-2019, Safety Standard for Refrigeration Systems
2. ANSI/ASHRAE 34-2019, Designation and Safety Classification of Refrigerants

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides a clarification to address the use of new systems but does not introduce any additional requirements that would impact cost.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal was passed as submitted because it provides clear criteria of what will be required in changing of refrigerants in this code and ASHRAE15 to be used. (Vote: 10-1)

Public Comments

Public Comment 1

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org) requests As Modified by Public Comment

Modify as follows:

2021 International Mechanical Code

1101.7 Changing Refrigerant . Changes of refrigerant in an existing system to a refrigerant with a different refrigerant designation shall only be allowed where in accordance with the following:

1. ~~The change of refrigerant shall be approved by the owner. owner.~~ The owner or the owner's authorized agent shall be notified prior to making a change of refrigerant, and the change of refrigerant shall not be made where the owner objects to the change.
2. The change in refrigerant shall be in accordance with one of the following.
   2.1 Written instructions of the original equipment manufacturer.
   2.2 An evaluation of the system by a registered design professional or by an approved agency that validates safety and suitability of the replacement refrigerant.
   2.3 Approved by the code official.
3. Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply.
4. Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this standard for a new installation, and the change of refrigerant shall require code official approval.

Commenter's Reason: The intent of notifying the owner or owner's agent is to ensure the owner of the building is aware of the change and can address any consequences to the building or occupancy that might be tied to the change of refrigerant. The owner notification can be made by the designer, contractor, installer or any other party involved in the proposed refrigerant change. This modification to the originally submitted language is more appropriate than requiring owner "approval."

Bibliography: ANSI/ASHRAE 15-2019, Safety Standard for Refrigeration Systems

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction This proposal provides a clarification to address the use of new systems but does not introduce any additional requirements that would impact cost.

Final Hearing Results

M73-21 AMPC1

M74-21

Original Proposal

IMC: TABLE 1103.1

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

TABLE 1103.1 REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE								[F] DEGREES OF HAZARD[a]
				RCL			LFL			OEL[d]		
				~~Pounds per 1,000 cubic feet~~ lb/MCf	ppm	g/m^3	lb/MCf	ppm	g/m^3	~~OEL~~[e] ppm		
R-11[b,c]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	~~6.2~~ 6.1				~~C~~ 1,000		2-0-0[b]
R-12[b,c]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90				1,000		2-0-0[b]
R-13[b,c]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—				1,000		2-0-0[b]
R-13B1[b,c]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—				1,000		2-0-0[b]
R-13I1	CF_3I	trifluoroiodomethane	A1	1.0	2,000	16				500		
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400				1,000		2-0-0[b]
R-22	$CHClF_2$	chlorodifluoromethane	A1	13	59,000	210				1,000		2-0-0[b]
R-23	CHF_3	trifluoromethane (fluoroform)	A1	7.3	41,000	120				1,000		2-0-0[b]
R-30	CH_2Cl_2	dichloromethane (methylene chloride)	B1	—	—	—				—		—
R-31	CH_2ClF	chlorofluoromethane	—	—	—	—				—		—
R-32	CH_2F_2	difluoromethane (methylene fluoride)	A2L[c]	4.8	36,000	77	19.1	144,000	306	1,000		1-4-0
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—				—		—
R-41	CH_3F	fluoromethane (methyl fluoride)	—	—	—	—				—		—
R-50	CH_4	methane	A3	—	—	—		50,000		1,000		—
R-113[b,c]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20				1,000		2-0-0[b]
R-114[b,c]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140				1,000		2-0-0[b]
R-115	$CClF_2CF_3$	chloropentafluoroethane	A1	47	120,000	760				1,000		—
R-116	CF_3CF_3	hexafluoroethane	A1	34	97,000	550				1,000		1-0-0
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57				50		2-0-0[b]
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56				1,000		2-0-0[b]
R-125	CHF_2CF_3	pentafluoroethane	A1	23	75,000	370				1,000		2-0-0[b]
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	13	50,000	210				1,000		2-0-0[b]
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	0.78	2,600	12	17.8	60,000	287	500		2-1-0
R-142b	CH_3CClF_2	1-chloro-1,1-difluoroethane	A2	5.1	20,000	~~83~~82	20.4	80,000	329	1,000		2-4-0
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2L[c]	~~4.5~~4.4	21,000	70	17.5	82,000	282	1,000		2-0-0[b]
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	8.1	48,000	130	1,000		1-4-0
R-170	CH_3CH_3	ethane	A3	0.54	7,000	~~8.7~~ 8.6	2.4	31,000	38	1,000		2-4-0
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	4.0	34,000	64	1,000		—
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	43	90,000	690				1,000		2-0-0[b]
R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	36	84,000	580				1,000		—
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	21	55,000	340				1,000		2-0-0[b]
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190				300		2-0-0[b]
R-290	$CH_3CH_2CH_3$	propane	A3	~~0.56~~0.59	5,300	9.5	2.4	21,000	38	1,000		2-4-0
R-C318	-$(CF_2)_4$-	octafluorocyclobutane	A1	41	80,000	~~660~~ 650				1,000		—
R-400[b,c]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160				1,000		2-0-0[b]
R-400[b,c]	zeotrope	R-12/114 (60.0/40.0)	A1	11	30,000	170				1,000		—
R-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	6.6	27,000	110				1,000		2-0-0[b]
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120				1,000		2-0-0[b]
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84				1,000		2-0-0[b]
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270				1,000		2-0-0[b]
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240				1,000		2-0-0[b]
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120				1,000		2-0-0[b]

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							[F] DEGREES OF HAZARD
				RCL			LFL			OEL	
				~~Pounds per 1,000 cubic feet~~ lb/MCf	ppm	g/m	lb/MCf	ppm	g/m	~~OEL~~ ppm	
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	~~70,000~~ 68,000	290				1,000	2-0-0 [b]
R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500				1,000	2-0-0 [b]
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/42.5)	—	16	57,000	260				1,000	—
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	~~25~~75	18.8	82,000	301.9	1,000	—
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300				1,000	2-0-0 [b]
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330				1,000	2-0-0 [b]
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290				1,000	2-0-0 [b]
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250				1,000	2-0-0 [b]
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280				1,000	2-0-0 [b]
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	20	95,000	320				1,000	—
R-407G	zeotrope	R-32/125/134a (2.5/2.5/95.0)	A1	13	52,000	210				1,000	—
R-407H	zeotrope	R-32/125/134a (32.5/15.0/52.5)	A1	19	92,000	300				1,000	—
R-407I	zeotrope	R-32/125/124a (19.5/8.5/72.0)	A1	16	71,100	250				1,000	—
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	~~95,000~~ 94,000	~~340~~ 330				1,000	2-0-0 [b]
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110				1,000	2-0-0 [b]
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120				1,000	2-0-0 [b]
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420				1,000	2-0-0 [b]
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430				1,000	2-0-0 [b]
R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	11.6	55,000	185.6	~~990~~ 970	—
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	14.8	70,000	238.3	~~980~~ 940	—
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	20.5	87,000	328.6	1,000	—
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	~~94~~93	23.4	88,000	374.9	1,000	—
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	6.4	26,000	100				1,000	—
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	6.0	23,000	~~95~~96				1,000	—
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	11.7	56,000	187.9	1,000	—
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	8.4	47,000	135.1	1,000	—
R-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~~55				1,000	2-0-0 [b]
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	~~70~~69				1,000	—
R-417C	zeotrope	R-125/134a/600 (19.5/78.8/1.7)	A1	5.4	21,000	87				1,000	—
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	19.2	89,000	308.4	1,000	—
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	16.7	60,000	268.6	1,000	—
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	18.5	69,000	297.3	1,000	—
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	~~45,000~~ 44,000	~~190~~ 180				1,000	2-0-0 [b]
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280				1,000	2-0-0 [b]
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330				1,000	2-0-0 [b]
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290				1,000	2-0-0 [b]
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250				1,000	2-0-0 [b]
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290				1,000	2-0-0 [b]
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260				1,000	2-0-0 [b]
R-422E	zeotrope	R-125/134a/600a (58.0/39.3/2.7)	A1	16	57,000	260				1,000	—
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	~~310~~ 300				1,000	2-0-0 [b]
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	6.2	23,000	100				~~970~~ 990	2-0-0 [b]
R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260				1,000	2-0-0 [b]
R-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	A1	5.2	20,000	83				990	—
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	18	79,000	290				1,000	2-1-0
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	~~83,000~~ 84,000	370				1,000	—
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	3.2	25,000	83.8	1,000	—
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	5.2	32,000	44.0	1,000	—
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	~~0.690~~.68	5,500	11	2.7	22,000	38.6	1,000	—
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	2.4	22,000	39.2	~~700~~ 550	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							[F] DEGREES OF HAZARD
				RCL			LFL			OEL	
				~~Pounds per 1,000 cubic feet~~ lb/MCf	ppm	g/m	lb/MCf	ppm	g/m	~~OEL~~ ppm	
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	2.4	20,000	32.4	~~880~~ 760	—
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	~~0.51~~0.39	~~4,500~~ 3,500	~~8.1~~ 6.3	2.0	18,000	32.1	950	—
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	~~3,600~~ 3,700	~~6.6~~ 6.5	2.0	18,000	83.8	790	—
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	20	73,000	320				1,000	—
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	1.1	8,500	17	4.3	34,000	68.2	1,000	—
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	2.0	16,000	32.3	1,000	—
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	~~8.1~~ 8.2	2.0	16,000	32.7	1,000	—
R-436C	zeotrope	R-290/600a (95.0/5.0)	A3	0.57	5,000	9.1	2.3	20,000	36.5	1,000	
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	~~5.0~~5.1	19,000	82				990	—
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	4.9	20,000	79				990	—
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	4.7	26,000	76	18.9	104,000	303.3	~~990~~ 1,000	—
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	7.8	46,000	124.7	1,000	—
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	0.39	3,200	6.3	2.0	16,000	31.7	1,000	—
R-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	21	100,000	330				1,000	—
R-443A	zeotrope	R-1270/290/600a (55.0/40.0/5.0)	A3	0.19	1,700	3.1	2.2	20,000	35.6	~~580~~ 640	—
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2L~~A2~~[c]	5.1	21,000	81	19.9	82,000	324.8	850	—
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2L~~A2~~[c]	4.3	23,000	69	17.3	93,000	277.3	~~890~~ 930	—
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2L~~A2~~[c]	4.2	16,000	67	2.7	63,000	347.4	930	—
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2L~~A2~~[c]	2.5	16,000	39	13.5	62,000	217.4	960	—
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2L~~A2~~[c]	2.6	16,000	42	18.9	65,000	303.5	~~900~~ 960	—
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2L~~A2~~[c]	~~23~~2.6	~~30,000~~ 16,000	~~360~~ 42	20.6	121,000	312.7	970	—
R-448A	zeotrope	R-32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)	A1	24	110,000	390				~~890~~ 860	—
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370				~~830~~ 840	—
R-449B	zeotrope	R-32/125/1234yf/134a (25.2/24.3/23.2/27.3)	A1	23	100,000	370				850	—
R-449C	zeotrope	R-32/125/1234yf/134a (20.0/20.0/31.0/29.0)	A1	23	98,000	360				800	—
R-450A	zeotrope	R-134a/1234ze(E) (42.0/58.0)	A1	20	72,000	320				880	—
R-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2L~~A2~~[c]	~~5.3~~5.0	18,000	81	20.3	70,000	326.6	~~520~~ 530	—
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2L~~A2~~[c]	~~5.3~~5.0	18,000	81	20.3	70,000	326.6	530	—
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	~~10,000~~ 100,000	440				~~780~~ 790	—
R-452B	zeotrope	R-32/125/1234yf (67.0/7.0/26.0)	A2L~~A2~~[c]	~~23~~4.8	30,000	~~360~~ 77	19.3	119,000	310.5	870	—
R-452C	zeotrope	R-32/125/1234yf (12.5/61.0/26.5)	A1	27	100,000	430				~~800~~ 810	—
R-453A	zeotrope	R-32/125/134a/227ea/600/601a (20.0/20.0/53.8/5.0/0.6/0.6)	A1	7.8	34,000	120				1,000	—
R-454A	zeotrope	R-32/1234yf (35.0/65.0)	A2L~~A2~~[c]	~~28~~3.2	16,000	~~450~~ 52	18.3	63,000	293.9	690	—
R-454B	zeotrope	R-32/1234yf (68.9/31.1)	A2L~~A2~~[c]	~~22~~3.1	19,000	~~360~~ 49	22.0	77,000	352.6	850	—
R-454C	zeotrope	R-32/1234yf (21.5/78.5)	A2L~~A2~~[c]	~~29~~4.4	19,000	~~460~~ 71	18.0	62,000	289.5	620	—
R-455A	zeotrope	R-744/32/1234yf (3.0/21.5/75.5)	A2L~~A2~~[c]	~~23~~4.9	~~30,000~~ 22,000	~~380~~ 79	26.9	118,000	432.1	650	—
R-456A	zeotrope	R-32/134a/1234ze(E) (6.0/45.0/49.0)	A1	20	77,000	320				900	—
R-457A	zeotrope	R-32/1234yf/152a (18.0/70.0/12.0)	A2L~~A2~~[c]	~~25~~3.4	15,000	~~400~~ 54	13.5	60,000	216.3	650	—
R-457B	zeotrope	R-32/1234yf/152a (35.0/55.0/10.0)	A2L	3.7	19,000	59	14.9	76,000	239	730	

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							[F] DEGREES OF HAZARD
				RCL			LFL			OEL	
				~~Pounds per 1,000 cubic feet~~ lb/MCf	ppm	g/m	lb/MCf	ppm	g/m	~~OEL~~ ppm	
R-458A	zeotrope	R-32/125/134a/227ea/236fa (20.5/4.0/61.4/13.5/0.6)	A1	18	76,000	280				1,000	—
R-459A	zeotrope	R-32/1234yf/1234ze(E) (68.0/26.0/6.0)	A2L~~A2~~[c]	~~23~~4.3	27,000	~~360~~ 69	17.4	107,000	278.7	870	—
R-459B	zeotrope	R-32/1234yf/1234ze(E) (21.0/69.0/10.0)	A2L~~A2~~[c]	30	~~16,000~~ 25,000	~~470~~ 92	23.3	99,000	373.5	640	—
R-460A	zeotrope	R-32/125/134a/1234ze(E) (12.0/52.0/14.0/22.0)	A1	24	92,000	380				~~650~~ 950	—
R-460B	zeotrope	R-32/125/134a/1234ze(E) (28.0/25.0/20.0/27.0)	A1	25	120,000	400				950	—
R-460C	zeotrope	R-32/125/134a/1234ze(E) (2.5/2.5/46.0/49.0)	A1	20	73,000	310				900	
R-461A	zeotrope	R-125/143a/134a/227ea/600a (55.0/5.0/32.0/5.0/3.0)	A1	17	61,000	270				1,000	—
R-462A	zeotrope	R-32/125/143a/134a/600 (9.0/42.0/2.0/44.0/3.0)	A2	3.9	16,000	62	16.6	105,000	265.8	1,000	—
R-463A	zeotrope	R-744/32/125/1234yf/134a (6.0/36.0/30.0/14.0/14.0)	A1	19	98,000	300				990	—
R-464A	zeotrope	R-32/125/1234ze(E)/227ea (27.0/27.0/40.0/6.0)	A1	27	120,000	430				930	
R-465A	zeotrope	R-32/290/1234yf (21.0/7.9/71.1)	A2	2.5	12,000	40	10.0	98,000	160.9	660	
R-466A	zeotrope	R-32/125/13I1 (49.0/11.5/39.5)	A1	6.2	30,000	99				860	
R-467A	zeotrope	R-32/125/134a/600a (22.0/5.0/72.4/0.6)	A2L	6.7	31,000	110				1,000	
R-468A	zeotrope	R-1132a/32/1234yf (3.5/21.5/75.0)	A2L	4.1	18,000	66				610	
R-469A	zeotrope	R-744/R-32/R-125 (35.0/32.5/32.5)	A1	8	53,000					1,600	
R-470A	zeotrope	R-744/32/125/134a/1234ze(E)/227ea (10.0/17.0/19.0/7.0/44.0/3.0)	A1	17	77,000	270				1,100	
R-470B	zeotrope	R-744/32/125/134a/1234ze(E)/227ea (10.0/17.0/19.0/7.0/44.0/3.0)	A1	16	72,000	270				1,100	
R-471A	zeotrope	R-1234ze(E)/227ea/1336mzz(E) (78.7/4.3/17.0)	A1	9.7	31,000	160				710	
R-472A	zeotrope	R-744/32/134a (69.0/12.0/19.0)	A1	4.5	35,000	72				2,700	
R-500~~[d]~~	azeotrope	R-12/152a (73.8/26.2)	A1	~~7.6~~7.4	~~30,000~~ 29,000	120				1,000	~~2.0.0~~ [b]
R-501~~[d,c]~~	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210				1,000	—
R-502~~[d]~~	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330				1,000	~~2.0.0~~ [b]
R-503~~[d]~~	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—				1,000	~~2.0.0~~ [b]
R-504~~[d,c]~~	azeotrope	R-32/115 (48.2/51.8)	—	28	140,000	450				1,000	—
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	~~520~~ 510				1,000	~~2.0.0~~ [b]
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220				1,000	~~2.0.0~~ [b]
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200				1,000	~~2.0.0~~ [b]
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	~~390~~ 380				1,000	~~2.0.0~~ [b]
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	3.5	29,000	56.1	1,000	—
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	2.4	21,000	38.0	1,000	—
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	7.7	45,000	123.9	1,000	—
R-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320				650	—
R-513B	azeotrope	R-1234yf/134a (58.5/41.5)	A1	21	74,000	330				640	—
R-514A	azeotrope	R-1336mzz(S)/1130(E) (74.7/25.3)	B1	0.86	2,400	~~14~~				320	—
R-515A	azeotrope	R-1234ze(E)/227ea (88.0/12.0)	A1	19	~~62,000~~ 63,000	300				810	—
R-515B	azeotrope	R-1234ze(E)/227ea (91.1/8.9)	A1	18	61,000	290				810	
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	~~7.0~~3.2	~~27,000~~ 13,000	~~110~~ 52	13.1	50,000	210.1	590	—
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	3.0	20,000	48	1,000	1-4-0
R-600a	$CH(CH_3)2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	~~9.6~~ 9.5	2.4	16,000	38	1,000	2-4-0
R-601	$CH_3CH_2CH_2$ CH_2CH_3	pentane	A3	0.18	1,000	2.9	2.2	12,000	35	600	—
R-601a	$(CH_3)2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	2.4	13,000	38	600	—
R-610	$CH_3CH_2OCH_2CH_3$	ethoxyethane (ethyl ether)	—	—	—	—				400	—
R-611	$HCOOCH_3$	methyl formate	B2	—	—	—				100	—
~~R-717~~	~~NH_3~~	~~ammonia~~	B2L	0.014	320	0.22	7.2	~~167,000~~	116	25	3-3-0[c]
R-718	H_2O	water	A1	—	—	—				—	0-0-0
R-744	CO_2	carbon dioxide	A1	4.5	40,000	72				5,000	2-0-0 [b]
R-1130(E)	CHCl=CHCl	trans-1,2-dichloroethene	~~B1~~B2	0.25	1,000	4	16	65,000	258	200	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							[F] DEGREES OF HAZARD
				RCL			LFL			OEL	
				Pounds per 1,000 cubic feet lb/MCf	ppm	g/m	lb/MCf	ppm	g/m	OEL ppm	
R-1132a	$CF_2=CH_2$	1,1-difluoroethylene	A2	2.0	13,000	33	8.1	50,000	131	500	—
R-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	2.2	31,000	36	200	1-4-2
R-1224yd(Z)	$CF_3CF=CHCl$	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	360 370				1,000	—
R-1233zd(E)	$CF_3CH=CHCl$	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85				800	—
R-1234yf	$CF_3CF=CH_2$	2,3,3,3-tetrafluoro-1-propene	A2LA2[c]	4.74.5	16,000	75	18.0	62,000	289	500	—
R-1234ze(E)	$CF_3CH=CHF$ $CF_3CH=CFH$	trans-1,3,3,3-tetrafluoro-1-propene	A2LA2[c]	4.7	16,000	7576	18.8	65,000	303	800	—
R-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7				500	1-4-1
R-1336mzz(E)	$CF_3CHCHCF_3$	trans 1,1,1,4,4,4-hexafluoro-2- butene	A1	3.0	7,200	48				400	
R-1336mzz(Z)	$CF_3CHCHCF_3$	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	5.45.2	13,000	8784				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. ~~The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2~~.

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

d 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.

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 34-2019 or the published addenda to ASHRAE Standard 34-2019 located at the link above.

Bibliography: ASHRAE Standard 34-2019, Designation and Safety Classification of Refrigerants, with addenda c, d, e, f, g, h, l, m, p, t, u, x, y - 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 **As Modified**

Committee Modification: TABLE 1103.1 REFRIGERANT CLASSIFICATION, AMOUNT AND OEL**Portions of table not shown remain unchanged.**

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							[F] DEGREES OF HAZARD[a]
				RCL			LFL			OEL[d]	
				lb/MCf	ppm	g/m^3	lb/MCf	ppm	g/m^3	ppm	

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE							[F] DEGREES OF HAZARD
				RCL			LFL			OEL	
				lb/MCf	ppm	g/m	lb/MCf	ppm	g/m	ppm	
~~R-717~~	~~NH_3~~	~~ammonia~~	~~B2L~~	~~0.014~~	~~320~~	~~0.22~~	~~7.2~~	~~167,000~~	~~116~~	~~25~~	~~3-3-0[G]~~

Committee Reason: This proposal has passed as it appropriately updates the Table to match SSPC-34 2019 requirements. The modification recognizes that this chapter does not cover ammonia by removing it from the Table. (Vote: 11-0)

Final Hearing Results

M74-21 AM

M75-21

Original Proposal

IMC: 1104.3.1, 1104.3.2, TABLE 1104.3.2

Proponents: Helen Walter-Terrinoni, AHRI, AHRI (helen.a.walter-terrinoni@outlook.com); Julius Ballanco, JB Engineering and Code Consulting, P.C., Daikin US (JBENGINEER@aol.com); Andrew Klein, A S Klein Engineering, The Chemours Company (andrew@asklein.com); Joe Nebbia, Newport Partners, Natural Resources Defense Council (jnebbia@newportpartnersllc.com)

International Mechanical Code

2021 International Mechanical Code

Revise as follows:

1104.3.1 Air conditioning for human comfort. ~~In other than industrial occupancies where the quantity in a single independent circuit does not exceed the amount in Table 1103.1, Group B1, B2 and B3 refrigerants shall not be used in high-probability systems for air conditioning for human comfort.~~ High probability systems used for human comfort shall use Group A1 or A2L refrigerant.

Exceptions:

1. Listed equipment for residential occupancies containing a maximum of 6.6 pounds (3 kg) of refrigerant.
2. Listed equipment for commercial occupancies containing a maximum of 22 pounds (10 kg) of refrigerant.
3. Industrial occupancies.

1104.3.2 ~~Nonindustrial occupancies~~Group A3 and B3 refrigerants. ~~Group A2 and B2 refrigerants shall not be used in high-probability systems where the quantity of refrigerant in any independent refrigerant circuit exceeds the amount shown in Table 1104.3.2.~~ Group A3 and B3 refrigerants shall not be used except where *approved*.

~~Exception~~ Exceptions: This section does not apply to:

1. l~~aboratories~~ Laboratories where the floor area per occupant is not less than 100 square feet (9.3 m2).
2. Listed self contained systems having a maximum of 0.331 pounds (150 g) of Group A3 refrigerant.
3. Industrial occupancies.

Delete without substitution:

~~TABLE 1104.3.2 MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS~~

TYPE OF REFRIGERATION SYSTEM	MAXIMUM POUNDS FOR VARIOUS OCCUPANCIES			
	Institutional	Public a ssembly	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: These requirements are based on previous editions of ASHRAE 15. ASHRAE 15 has been updated numerous times resulting in the modification to the requirement similar to this proposal. High probability direct systems for human comfort must use either Group A1 or

A2L refrigerant. Other refrigerants can be used provided the maximum charge does not exceed 6.6 pound for residential applications and 22 pounds for commercial units. Plus, these unit must be listed for use with these other refrigerants. The revision to Section 1104.3.1 becomes consistent with Section 7.5.2 of ASHRAE 15. Although, ASHRAE lists the refrigerants prohibited for this application, whereas this proposal lists the refrigerants required to be used.
Section 1104.3.2 text being stricken is addressed in the revised text to Section 1104.3.1. The remaining text is consistent with the requirements in Section 7.5.3 of ASHRAE 15.

Addendum i of ASHRAE 15-2019 deleted the table that is equivalent to Table 1104.3.2. This table is no longer necessary with the change to ammonia refrigerant requirements during the last two cycles and with the change adding the exceptions to Section 1104.3.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is a clarification of the current requirements that allow Group A1 and A2L for high probability system used for human comfort. There is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

1104.3.1Air conditioning for human comfort.
High probability systems used for human comfort shall use Group A1 or A2L refrigerant.

Exceptions:

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

1104.3.2Group A2, A3, B2 and B3 refrigerants.
Group A2 and B2 refrigerants shall not be used in high-probability systems. GroupA3 and B3 refrigerants shall not be used except where *approved*.

Exceptions: This section does not apply to:

1. Laboratories where the floor area per occupant is not less than 100 square feet (9.3 m2).
2. Listed self contained systems having a maximum of 0.331 pounds (150 g) of Group A3 refrigerant.
3. Industrial occupancies.
4. Equipment listed for and used in residential occupancies containing a maximum of 6.6 pounds (3 kg) of Group A2 or B2 refrigerant.
5. Equipment listed for and used in commercial occupancies containing a maximum of 22 pounds (10 kg) of Group A2 or B2 refrigerant.

Committee Reason: This proposal has been approved as modified because it clarifies and matches up with change made in ASHRAE15 group A3 and B3 requirements. (Vote: 10-0)

Final Hearing Results

M75-21 AM

M77-21 Part I

Original Proposal

IMC: 1106.3

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

THIS IS A TWO PART CODE CHANGE. PART I AND PART II WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2021 International Mechanical Code

Revise as follows:

1106.3 ~~Flammable~~Class 2 and 3 refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the *machinery room* shall conform to the Class I, Division 2, *hazardous location* classification requirements of NFPA 70.

~~Exception:~~ ~~*Machinery rooms* for systems containing Group A2L *refrigerants* that are provided with ventilation in accordance with Section 1106.4.~~

Reason: The second exception in the Fire Code and the exception in the Mechanical Code are no long necessary with the revision in the 2021 International Mechanical Code regarding refrigerant classification. A2L is a separate group of refrigerant. Both sections state that the requirements apply to A2, A3, B2, and B3. Hence, A2L is not included in the requirements so the two exceptions proposed for deletion no longer are needed.
ASHRAE 15 has been modified removing the term "flammable refrigerant" and replacing it with the specific Class of refrigerant. Section 1106.3 has thus been modified to indicate Class 2 and 3 refrigerants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature. As a result, there is no impact to the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because it cleans up the language based on revisions to ASHRAE 15 and the 2021 IMC with respect to the hazardous location requirements in NFPA70. (Vote: 11-0)

Final Hearing Results

M77-21 Part I AS

M77-21 Part II

Original Proposal

IFC: [M] 608.17

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

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2021 International Fire Code

Revise as follows:

[M] 608.17 Electrical equipment. Where refrigerant of Groups A2, A3, B2 and B3, as defined in the*International Mechanical Code*, are used, refrigeration machinery rooms shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70.

~~Exceptions~~ Exception:

1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1101.1.2, Exception 1 of the International Mechanical Code.
2. ~~Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 608.18.~~

Reason: The second exception in the Fire Code and the exception in the Mechanical Code are no long necessary with the revision in the 2021 International Mechanical Code regarding refrigerant classification. A2L is a separate group of refrigerant. Both sections state that the requirements apply to A2, A3, B2, and B3. Hence, A2L is not included in the requirements so the two exceptions proposed for deletion no longer are needed.
ASHRAE 15 has been modified removing the term "flammable refrigerant" and replacing it with the specific Class of refrigerant. Section 1106.3 has thus been modified to indicate Class 2 and 3 refrigerants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature. As a result, there is no impact to the cost of construction.

Public Hearing Results

Committee Action — As Submitted

Committee Reason: The proposal passed as submitted because exception 608.17, limited flammability refrigeration, is no longer necessary. (Vote: 11-0)

Final Hearing Results

M77-21 Part II — AS

M78-21 Part I

Original Proposal

IMC: 1106.4, 1106.4.1 (New), 1106.4.2, TABLE 1106.4.2 (New), TABLE 1106.4.2, 1106.4.3

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Delete and substitute as follows:

~~**1106.4 Special requirements for Group A2L refrigerant machinery rooms.** *Machinery rooms* with systems containing Group A2L *refrigerants* that do not conform to the Class I, Division 2, hazardous location electrical requirements of NFPA 70, as permitted by the exception to Section 1106.3, shall comply with Sections 1106.4.1 through 1106.4.3.~~

~~**Exception:** *Machinery rooms* conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.4.1 and 1106.4.2.~~

1106.4 Group A2L and B2L Refrigerant. Machinery rooms for Group A2L and B2L refrigerant shall comply with Sections 1106.4.1 through Section 1106.4.3.

Add new text as follows:

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

Delete and substitute as follows:

~~**1106.4.2 Emergency ventilation system.** An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 1106.4.2. Shutdown of the emergency ventilation system shall be by manual means.~~

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

Add new text as follows:

TABLE 1106.4.2 GROUP A2L and B2L DETECTOR ACTIVATION

Activation Level	Maximum Response Time (seconds)	ASHRAE 15 Ventilation Level	Alarm Reset	Alarm Type
Less than or equal to the OEL in Table 1103.1	300	1	Automatic	Trouble
Less than or equal to the refrigerant concentration level in Table 1103.1	15	2	Manual	Emergency

Delete without substitution:

~~**TABLE 1106.4.2 MINIMUM EXHAUST RATES**~~

REFRIGERANT	Q(m/sec)	Q(cfm)
REFRIGERANT	Q(m/sec)	Q(cfm)
R32	15.4	32,600
R143	13.6	28,700
R444A	6.46	13,700
R444B	10.6	22,400
R445A	7.83	16,600
R446A	23.9	50,700
R447A	23.8	50,400
R451A	7.04	15,000
R451B	7.05	15,000
R1234yf	7.80	16,600
R1234ze(E)	5.92	12,600

Delete and substitute as follows:

~~**1106.4.3 Emergency ventilation system discharge.** The emergency ventilation system point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, *ventilation* opening or *exit*.~~

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

Reason: The machinery room requirements in the 2019 edition of ASHRAE 15 have been completely revised for Group A2L and B2L refrigerants. The table in the current code was part of the original draft to ASHRAE 15 that was subsequently rejected as being inaccurate. This is proposed for deletion.
With Group A2L and B2L refrigerants, research has proven that open flames and hot surfaces can be at a higher temperature than Group A2, A3, B2, and B3 refrigerants. Section 1106.4.1 adds special provisions for Group A2L and B2L refrigerants regarding hot surfaces. New ventilation requirements were added to ASHRAE 15 for machinery rooms using Group A2L and B2L refrigerants. There are two levels of ventilation that are required based on the response of the refrigerant detector. This proposal references ASHRAE 15 for the ventilation requirement (note that the latest standard can be viewed free of charge at https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards.) A table is included that identifies the two levels of annunciation in the event of a refrigerant leak in a machinery room. The first activation is a trouble alarm for a small leak. This requires a minimal amount of ventilation. The second level is an emergency alarm. This signals the activation of the full amount of ventilation for the room.

Bibliography: 1. ANSI/ASHRAE 15-2019, Safety Standard for Refrigeration Systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change clarifies the requirements for ventilation of a machinery room. The use of A2L refrigerant is optional.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because it aligns IMC with ASHRAE regarding temperature controls in refrigerator rooms based upon detection levels. (Vote: 10-1)

Final Hearing Results

M78-21 Part I AS

M78-21 Part II

Original Proposal

IMC: [F] 1106.4.1

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Delete without substitution:

~~**[F] 1106.4.1 Ventilation system activation.** Ventilation shall be activated by the refrigerant detection system in the *machinery room*. Refrigerant detection systems shall be in accordance with Section 605.8 of the International Fire Code and all of the following:~~

~~1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.~~

~~2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.4.2.~~

~~3. The detection, signaling and control circuits shall be supervised.~~

Reason: The machinery room requirements in the 2019 edition of ASHRAE 15 have been completely revised for Group A2L and B2L refrigerants. The table in the current code was part of the original draft to ASHRAE 15 that was subsequently rejected as being inaccurate. This is proposed for deletion.

With Group A2L and B2L refrigerants, research has proven that open flames and hot surfaces can be at a higher temperature than Group A2, A3, B2, and B3 refrigerants. Section 1106.4.1 adds special provisions for Group A2L and B2L refrigerants regarding hot surfaces. New ventilation requirements were added to ASHRAE 15 for machinery rooms using Group A2L and B2L refrigerants. There are two levels of ventilation that are required based on the response of the refrigerant detector. This proposal references ASHRAE 15 for the ventilation requirement (note that the latest standard can be viewed free of charge at https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards.) A table is included that identifies the two levels of annunciation in the event of a refrigerant leak in a machinery room. The first activation is a trouble alarm for a small leak. This requires a minimal amount of ventilation. The second level is an emergency alarm. This signals the activation of the full amount of ventilation for the room.

Bibliography: 1. ANSI/ASHRAE 15-2019, Safety Standard for Refrigeration Systems.

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

This change clarifies the requirements for ventilation of a machinery room. The use of A2L refrigerant is optional.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal better aligns the IMC with ASHRAE 15. ASHRAE 15 already requires supervision of ventilation detection, signaling and control circuits and does not need to also be addressed in the IMC. (Vote: 14-0)

Final Hearing Results

M79-21

Original Proposal

IMC: 1107.3, 1107.6, 1107.7, 1108.1, 1108.3.3, 1109.8.1, 1109.8.2, 1110.3, 1110.5.1

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

1107.3 Materials 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~~refrigeration 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).

1107.6 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~~refrigeration 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~~refrigeration systems.

1108.1 Approval. Joints and connections shall be of an *approved* type. Joints and connections shall be tight for the pressure of the ~~refrigerant~~refrigeration system when tested in accordance with Section 1110.

1108.3.3 Soldered joints. Joint surfaces to be soldered shall be cleaned and a flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. Solder joints shall be limited to ~~refrigerant~~refrigeration systems using Group A1 refrigerant and having a pressure of less than or equal to 200 psi (1378 kPa).

1109.8.1 ~~Refrigerating~~Refrigeration systems containing more than 6.6 pounds (3.0 kg) of refrigerant. Stop valves shall be installed in the following locations on ~~refrigerating~~refrigeration 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~~Refrigeration 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 pounds (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 at the inlet of a receiver in a condensing unit nor at the inlet of a receiver that is an integral part of the condenser.
2. Systems utilizing nonpositive displacement compressors.

1110.3 Test gases. The medium used for pressure testing the ~~refrigerant~~refrigeration system shall be one of the following inert gases: oxygen-free nitrogen, helium or argon. For R-744 ~~refrigerant~~refrigeration systems, carbon dioxide shall be allowed as the test medium. For

R-718 ~~refrigerant~~refrigeration systems, water shall be allowed as the test medium. Oxygen, air, combustible gases and mixtures containing such gases shall not be used as a test medium. Systems erected on the premises with tubing not exceeding $^{5}/_{8}$ inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.

1110.5.1 Joints and refrigerant-containing parts in air ducts. Joints and all refrigerant-containing parts of a ~~refrigerating~~refrigeration 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.

Reason: This proposed change cleans up the language added during the last cycle. ASHRAE 15 has used refrigerant systems and refrigeration systems interchangeably for many years. ASHRAE SSPC 15 has voted to convert all of the text in the standard to "refrigeration systems." This change will keep the Mechanical Code consistent with ASHRAE 15.

Bibliography: ASHRAE 15-2019, Safety Standard for Refrigeration Systems

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

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
SECTION1102REFRIGERATION SYSTEM REQUIREMENTS

1102.1General.
The refrigeration system classification, allowable refrigerants, maximum quantity, enclosure requirements, location limitations, and field pressure test requirements shall be determined as follows:

1. Determine the refrigeration system's classification, in accordance with Section 1103.3.
2. Determine the refrigerant classification in accordance with Section 1103.1.
3. Determine the maximum allowable quantity of refrigerant in accordance with Section 1104, based on type of refrigerant, refrigeration system classification and *occupancy*.
4. Determine the refrigeration system enclosure requirements in accordance with Section 1104.
5. Refrigeration *equipment* and *appliance* location and installation shall be subject to the limitations of Chapter 3.
6. Nonfactory-tested, field-erected *equipment* and *appliances* shall be pressure tested in accordance with Section 1108.

1102.2.1Mixing.
Refrigerants, including refrigerant blends, with different designations in ASHRAE 34 shall not be mixed in arefrigeration system.

Exception: Addition of a second refrigerant is allowed where permitted by the *equipment* or *appliance* manufacturer to improve oil return at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer's instructions.

SECTION1104REFRIGERATION SYSTEM APPLICATION REQUIREMENTS

1104.2Machinery room.
Except as provided in Sections 1104.2.1 and 1104.2.2, all components containing the refrigerant shall be located either outdoors or in a*machinery room* where the quantity of refrigerant in an independent circuit of arefrigeration system exceeds the amounts shown in Table 1103.1. For refrigerant blends not listed in Table 1103.1, the same requirement shall apply where the amount for any blend component exceeds that indicated in Table 1103.1 for that component. This requirement shall also apply where the combined amount of the blend components exceeds a limit of 69,100 parts per million (ppm) by volume. *Machinery rooms* required by this section shall be constructed and maintained in accordance with Section 1105 for Group A1 and B1 refrigerants and in accordance with Sections 1105 and 1106 for Group

A2, B2, A3 and B3 refrigerants.

Exceptions:

1. *Machinery rooms* are not required for *listed equipment* and *appliances* containing not more than 6.6 pounds (3 kg) of refrigerant, regardless of the refrigerant's safety classification, where installed in accordance with the *equipment's* or *appliance's* listing and the *equipment* or *appliance* manufacturer's installation instructions.
2. Piping in compliance with Section 1107 is allowed in other locations to connect components installed in a*machinery room* with those installed outdoors.

1104.2.2Industrial 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.

   Exception: Refrigerant detectors are not required in unoccupied areas that contain only continuous piping that does not include valves, valve assemblies, *equipment* or *equipment* connections.
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 I, Division 2,*hazardous location* classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant 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 refrigeration 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*.

1106.3Flammable refrigerants.

Where refrigerants of Groups A2, A3, B2 and B3 are used, the*machinery room* shall conform to the Class I, Division 2,*hazardous location* classification requirements of NFPA 70.

Exception: *Machinery rooms* for refrigeration systems containing Group A2L *refrigerants* that are provided with ventilation in accordance with Section 1106.4.

1106.4Special requirements for Group A2L refrigerant machinery rooms.

Machinery rooms with refrigeration systems containing Group A2L *refrigerants* that do not conform to the Class I, Division 2, hazardous location electrical requirements of NFPA 70, as permitted by the exception to Section 1106.3, shall comply with Sections 1106.4.1 through 1106.4.3.

Exception: *Machinery rooms* conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.4.1 and 1106.4.2.

1107.1Piping.

Refrigerant piping material for other than R-717 (ammonia) refrigeration systems shall conform to the requirements in this section. Piping material and installations for R-717 (ammonia) refrigeration systems shall comply with IIAR 2.

1107.6Valves.

Valves shall be of materials that are compatible with the type of piping material, refrigerants and oils in the refrigeration system. Valves shall be listed and labeled and rated for the temperatures and pressures of the refrigeration systems in which the valves are installed

1109.2.5Refrigerant pipe shafts.
Refrigerant piping that penetrates two or more floor/ceiling assemblies shall be enclosed in a fire-resistance-rated shaft enclosure. The fire-resistance-rated shaft enclosure shall comply with Section 713 of the*International Building Code*.

Exceptions:

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

1109.8.2Refrigeration systems containing more than 100 pounds (45 kg) of refrigerant.
In addition to stop valves required by Section 1109.8.1, refrigeration systems containing more than 100 pounds (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 at the inlet of a receiver in a condensing unit nor at the inlet of a receiver that is an integral part of the condenser.
2. Refrigeration ~~S~~systems utilizing nonpositive displacement compressors.

1110.6Booster 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 refrigeration system.

1110.7Centrifugal/nonpositive displacement compressors.
Where testing refrigeration systems using centrifugal or other nonpositive displacement compressors, the entire system shall be considered to be the low-pressure side for test purposes.

1110.8Contractor or engineer declaration.
The installing contractor or*registered design professional* of record shall issue a certificate of test to the code official for allrefrigeration 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 refrigeration system. The certification of test shall be signed by the installing contractor or *registered design professional a*nd shall be made part of the public record.

Committee Reason: The proposal has been passed as modified because the published reason correlates with actions on M10-21. This proposed change cleans up the language added during the last cycle. ASHRAE 15 has used refrigerant systems and refrigeration systems interchangeably for many years. ASHRAE SSPC 15 has voted to convert all of the text in the standard to “refrigeration systems.” This change will keep the Mechanical Code consistent with ASHRAE 15.(Vote: 11-0)

Final Hearing Results

M79-21 AM

M81-21

Original Proposal

IMC: 1108.5

Proponents: Pennie L Feehan, Pennie L Feehan Consulting, Copper Development Association (penniefeehan@me.com)

2021 International Mechanical Code

Delete without substitution:

~~**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.~~

Reason: Because brass is a copper alloy, this section is not needed and is covered in Section 1108.6.

Bibliography: 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.

Cost Impact: The code change proposal will increase the cost of construction
This is simply an elimination of duplication of requirements in code. It is a clarification of the code that does not affect materials or labor.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted because it appropriately deletes Section 1108.5 dealing with Brass Pipe, as brass is simply one of several copper alloys. Section 1108.6 covers it. (Vote: 11-0)

Final Hearing Results

M81-21 AS

M82-21

Original Proposal

IMC: 1109.4.1

Proponents: Pennie L Feehan, Pennie L Feehan Consulting, Copper Development Association (penniefeehan@me.com)

2021 International Mechanical Code

Revise as follows:

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~~ copper alloy 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.

Reason: Brass and Bronze are Copper Alloys. Copper Alloy is the correct term.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is editorial to update the use of terms in the code. Editorial changes do not affect material or labor costs.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted because it is editorial and cleans up language based on actions in previous years, with respect to copper alloys.
(Vote: 11-0)

Final Hearing Results

M82-21 AS

M83-21

Original Proposal

IMC: TABLE 1107.4, TABLE 1107.5, 1107.7, 1109.2.2, 1109.2.3, 1109.2.6, 1109.2.7, 1109.3, 1109.3.1, 1109.3.2, 1109.4, 1109.4.1, 1109.4.2, 1109.7, 1110.3, 1110.3.1 (New), 1110.5, 1110.5.2, 1110.5.1, 1110.6, 1110.7, ASTM Chapter 15 (New)

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Revise as follows:

TABLE 1107.4 REFRIGERANT PIPE

PIPING MATERIAL	STANDARD
Aluminum tube	ASTM B210/ASTM B210M, ASTM B491/B491M
Brass (copper alloy) pipe	ASTM B43
Copper linesets	ASTM B280, ASTM B1003
Copper pipe	ASTM B42, ASTM B302
Copper tube[a]	ASTM B68, ASTM B75, ASTM B88, ASTM B280, ASTM B819
Steel pipe[b]	ASTM A53, ASTM A106, ASTM A333
Steel tube	ASTM A254, ASTM A334

a. Soft annealed copper tubing larger than $1^3/_8$ inch (35 mm) O.D. shall not be used for field-assembled refrigerant piping unless it is protected from mechanical damage.

b. ASTM A53, Type F steel pipe shall ~~not be used for refrigerant lines having an operating temperature less than -20°F (-29°C)~~only be permitted for discharge lines in pressure relief systems.

TABLE 1107.5 REFRIGERANT PIPE FITTINGS

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

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

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

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

1. Where installed without ready access or located more than 7 feet 3 inches (2210 mm) above the finished floor.
2. Where located within 6 feet (1829 mm) of the refrigerant unit or *appliance*.

3. Where located in a *machinery room* complying with Section 1105.
4. Outside the building:
   4.1. Protected from damage from the weather, including, but not limited to, hail, ice, and snow loads, and
   4.2. Protected from damage within the expected foot or traffic path
   4.3. Outside underground installed not less than 8 inches (200 mm) below finished grade and protected against corrosion.

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

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

1109.2.6 Exposed piping surface temperature. Exposed piping with ready access to nonauthorized personnel 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).

1109.2.7 Pipe identification. Refrigerant pipe located in areas other than the room or space where the refrigerating *equipment* is located shall be identified. The pipe identification shall be located at intervals not exceeding 20 feet (6096 mm) on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be $^1/_2$ inch (12.7 mm). The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2L and B2L refrigerants the identification shall also include the following statement: “WARNING – Risk of Fire. Flammable Refrigerant.” For Group A2, A3, B2 and B3 refrigerants, the identification shall also include the following statement: "DANGER—Risk of Fire or Explosion. Flammable Refrigerant." For any Group B refrigerant, the identification shall also include the following statement: "DANGER—Toxic Refrigerant."

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

1109.3.1 Pipe protection. In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group ~~A2L~~A2, A3, ~~and~~ B2L, B2, and B3 refrigerants and located in concealed locations where tubing is installed in studs, joists, rafters or similar member spaces, and located less than $1^1/_2$ 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 (1.46 mm) (No. 16 gage) shall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.

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

Delete without substitution:

~~**1109.4 Installation requirements for Group A2, A3, B2 or B3 refrigerant.** Piping systems using Group A2, A3, B2 or B3 refrigerant shall~~

~~comply with the requirements of Sections 1109.4.1 and 1109.4.2.~~

~~**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~~.

~~**1109.4.2 Shaft ventilation.** Refrigerant pipe shafts with systems using Group A2, A3, B2 or B3 refrigerant 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.~~

~~**1109.7 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~~.

Revise as follows:

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 or premixed nonflammable oxygen-free nitrogen with a tracer gas of hydrogen or helium. For R-744 refrigerant systems, carbon dioxide shall be allowed as the test medium. For R-718 refrigerant systems, water shall be allowed as the test medium. ~~Oxygen, air, combustible gases and mixtures containing such gases shall not be used as a test medium. Systems erected on the premises with tubing not exceeding $^{5}/_{8}$ inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.~~

Add new text as follows:

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

Revise as follows:

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

Refrigerant piping and tubing greater than 3/4 inches in diameter shall be tested in accordance with ASHRAE 15.

~~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 1,500 microns for a period of not less than 10 minutes.~~

Delete without substitution:

~~**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.~~

~~**1110.5.1 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.~~

~~**1110.6 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.~~

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

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

Reason: For Table 1107.4, ASHRAE 15 modified the piping requirements by adding ASTM A333, which is a steel pipe used in refrigerant piping systems. The other change is to modification of Note b. ASHRAE 15 added restrictions to the use of Type F pipe. For many years, Type F pipe ceased to be manufactured in the United States. Hence, the requirements were basically ignored. With the influx of foreign made steel pipe, Type F pipe has reemerged in the United States. That is why it is important to add the limitation since Type F pipe does not have strength and longevity of ERW pipe. Note: ASTM will provide the documentation required to add ASTM A333 to the Chapter 15 references.

For Table 1107.5 , the change is editorial. ASHRAE SSPC 15 Refrigerant Piping Working Group combined brass and copper fittings since the fittings can be used for either piping material. The fitting standard shown being removed are already located under the current heading of copper.

For Section 1107.7, we propose to add a reference to UL 207, which has been modified to add requirements for flexible connectors and expansion and vibration compensators. The other change is a mandate that the components be rated for the pressure of the refrigerant piping system. While this is already implied, it is better to include the wording to avoid improper interpretation of the requirement.

For Sections 1109.2-1109.4, There are two changes made by the ASHRAE 15 Committee regarding piping installation requirements. New requirements were added for piping protection when installed on the outside of the building. This includes buried pipe. The other change relates to interior exit stairways. These spaces are often heated and cooled by individual heat pumps. Thus, there is refrigerant piping within the exit stairs, however, the piping is not exposed creating a hazard. Furthermore, the quantity of refrigerant in the piping must be below the RCL (refrigerant concentration limit). The installation requirements for flammable refrigerants were also simplified by combining the sections of A2L and B2L with A2, A3, B2, and B3. The changes that resulted from the combining of the sections was the allowance of steel, stainless steel, and copper tubing for A2, A3, B2, and B3. ASHRAE 15 Committee found no reason for the continued requirement of limiting A2, A3, B2, and B3 refrigerants to pipe while not allowing tube. Both materials can handle the refrigerants and pressures. Furthermore, there are protection requirements for the tubing. In the tubing protection section, Group A2L was removed. This is based on testing showing that continuous protection is unnecessary for Group A2L refrigerants. The protection of stud and joist penetrations remain. The other changes include a statement on nonauthorized personnel for protection of the piping. This would allow exposed piping in machinery rooms. The last change is a marking requirement for A2L and B2L piping. This added marking of the piping is consistent with the labeling required by UL/CSA 60335-2-40.

For Section 1109.7, The ASHRAE 15 Committee was of the opinion that this section would be very difficult for a code official to enforce. To eliminate unintended consequences of the uncertainty associated with dew point will in a given space, this section was deleted during the

updating of the piping requirements.

For Section 1110, The proposed Test Gas requirements adds an allowance for the use of premixed nitrogen with a tracer gas or either hydrogen or helium. The tracer gas makes it easier to detect a leak in larger refrigeration piping systems. The use of tracer gases for testing piping systems is common practice in larger refrigeration systems. The changes to the testing section reflect modifications made in ASHRAE 15 to expand the requirements for large piping systems in which a greater duration is appropriate. Note that the latest standard can be viewed free of charge at https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards.

Bibliography: 1. ASTM A333-18, Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness.
2. ANSI/ASHRAE Standard 15-2019, Safety Standard for Refrigeration Systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
While some times for testing are increased, technicians can normally be completing other tasks associated with the refrigeration system during these times.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has been passed as submitted. The language clarifies refrigerant series already approved. (Vote: 11-0)

Final Hearing Results

M83-21 AS

M84-21

Original Proposal

IMC: 1110.3

Proponents: Emily Toto, ASHRAE, ASHRAE (etoto@ashrae.org)

2021 International Mechanical Code

Delete and substitute as follows:

~~**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 a test medium. Systems erected on the premises with tubing not exceeding 5/8 inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.~~

1110.3 Test gases.

Tests shall be performed with dry nitrogen or other nonflammable, nonreactive, dried gas. Oxygen, air, or mixtures containing them shall not be used. The means used to build up the test pressure shall have either a pressure limiting device or a pressure-reducing device and a gauge on the outlet side. The pressure-relief device shall be set above the test pressure but low enough to prevent permanent deformation of the system's components.

Exceptions:

1. Mixtures of dry nitrogen, inert gases, or a combination of them with Class 1 refrigerant in concentrations of a refrigerant weight fraction (mass fraction) not exceeding 5 percent shall be permitted for tests.
2. Mixtures of dry nitrogen, inert gases, or a combination of them with Class 2L, Class 2 and Class 3 refrigerants in concentrations not exceeding the lower of a refrigerant weight fraction (mass fraction) of 5 percent or 25 percent of the LFL shall be permitted for tests.
3. Compressed air without added refrigerants shall be permitted for tests, provided the system is subsequently evacuated to less than 1000 microns (0.1333 kPa) before charging with refrigerant. The required evacuation level is atmospheric pressure for systems using R-718 (water) or R-744 (carbon dioxide) as the refrigerant.
4. Systems erected on the premises using Group A1 refrigerant and with copper tubing not exceeding 0.62 of an inch (15.7 mm) outside diameter shall be tested by means of the refrigerant charged into the system at the saturated vapor pressure of the refrigerant at not less than 68°F (20°C).

Reason: This proposal aligns the IMC with ASHRAE 15, 2019 edition requirements for test gases, and specifies how to appropriately use refrigerants as tracer gases to minimize the use of and ensure only de minimis release of these products during testing. The proposed language is an extraction from ASHRAE 15-2019, Section 10.1.2

Bibliography: ASHRAE 15-2019, Safety Standard for Refrigeration Systems

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal provides clarity on test gas requirements.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted because it aligns with ASHRAE15-2019. (Vote: 11-0)

Final Hearing Results	
M84-21	AS

M85-21

Original Proposal

IMC: 1201.1

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

1201.1 Scope. The provisions of this chapter shall govern the construction, installation,*alteration* and repair of hydronic piping systems. This chapter shall apply to hydronic piping systems that are part of heating, ventilation and air-conditioning systems. Such piping systems shall include steam, hot water, radiant heating, radiant cooling, chilled water, steam condensate, ~~and~~ ground source heat pump loop systems and snow- and ice-melting. Potable cold and hot water distribution systems shall be installed in accordance with the*International Plumbing Code* .

Reason: The hydronic applications known as radiant heating & cooling and snow & ice melting are currently listed within Ch. 12 in Section 1209 Embedded Piping, but are missing from the Scope. Therefore, these types of hydronic systems should be listed within the Scope. Subsequent proposals, if accepted, will add new requirements for radiant heating & cooling and snow & ice melting tubing systems.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The hydronic applications known as radiant heating & cooling and snow & ice melting are currently listed within Ch. 12 in Section 1209 Embedded Piping, but are missing from the Scope.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has been passed as submitted based on the published reason statement of the proponent. The hydronic applications known as radiant heating & cooling and snow & ice melting are currently listed within Ch. 12 in Section 1209 Embedded Piping, but are missing from the Scope. Therefore, these types of hydronic systems should be listed within the Scope. (Vote: 11-0)

Final Hearing Results

M85-21 AS

M86-21

Original Proposal

IMC: TABLE 1202.4

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 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; ASTM F3253; 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: The referenced ABS specification ASTM D1527 was withdrawn by ASTM in 2013, so it should be removed from Table 1202.4. Lead pipe should not be used for hydronic systems due to health and safety reasons, and should be removed from this table. The referenced Federal Specification (FS) WW-P-325B has been cancelled. Searchable here https://fedspecs.gsa.gov/FedSpecsSearchPage

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact because the two reference standards which are proposed for deletion from Table 1202.4 are no longer published.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because standards (FS WW-P-325B) and materials (lead) reference in this application are no longer used or manufactured. (Vote: 11-0)

Final Hearing Results

M86-21 AS

M87-21

Original Proposal

IMC: TABLE 1202.4, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, Viega LLC (lisa.reiheld@viega.us)

2021 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; ASTM F3253; 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
Stainless Steel pipe	ASTM A269; ASTM A312; ASTM A554; ASTM A778
Stainless Steel tubing	ASTM A269; ASTM A312; ASTM A554; ASTM A778

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

ASTM A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

Add new text as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

ASTM A778/A778M-16 Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

Reason: Stainless steel material is proposed to be added for hydronic applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance. The proposed stainless steel standards are also referenced in other nationally recognized codes and are commonly used for potable water distribution and hydronic applications.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal of including stainless steel as another recognized material for the use in hydronic systems will not increase the cost of construction due to the fact that stainless steel piping and tubing would be only one of multiple material options the user of the code could specify.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

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; ASTM F3253; 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
Stainless Steel pipe	ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778
Stainless Steel tubing	ASTM A269; ASTM A312; ~~ASTM A554~~; ASTM A778

Committee Reason: The proposal has been approved based on the addition of stainless steel pipe and stainless steel tubing with hydronic systems along with the proponent reason statement. Stainless steel material is proposed to be added for hydronic applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance. The proposed stainless steel standards are also referenced in other nationally recognized codes and are commonly used for potable water distribution and hydronic applications. The modification removes reference to ASTM 554 and language is consistent with previous actions in the IPC. (Vote: 11-0)

Final Hearing Results

M87-21 AM

M88-21

Original Proposal

IMC: TABLE 1202.5, ASTM Chapter 15 (New)

Proponents: Lisa Reiheld, Viega LLC, Viega LLC (lisa.reiheld@viega.us)

2021 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 B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974; ASTM F3226
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
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 D2846; 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; ASTM F3226
Stainless Steel	ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F3226

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

A778/A778M-16 Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

Reason: ASTM F3226 Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems is now published and includes Carbon Steel, Stainless Steel, Copper and Copper-Alloy materials. By including this standard will provide a reference standard for press-connect technology for each of the alloys.

Stainless steel material is proposed to be added for applications where stainless steel pipe, tubing and fittings are necessary for corrosion resistance. The proposed stainless steel standards are also referenced in other nationally recognized codes and are commonly used for potable water distribution and hydronic applications.

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

This standard is not the only standard that the pipe fittings can meet in accordance with the Pipe Fittings Table, this is just an alternative standard that some manufacturer's have tested their products to and would like to see recognized as an acceptable standard for pipe fittings. Testing to this standard is optional and no existing standards have been removed or replaced by the proposed addition of this standard.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

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 B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974; ASTM F3226
CPVC	ASSE 1061; ASTM D2846; ASTM F438; ASTM F439
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
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 D2846; 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; ASTM F3226
Stainless Steel	ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778; ASTM F3226

Committee Reason: The committee agreed that stainless steel pipe, tubing and fittings, and their associated reference standards are appropriate for hydronic pipe fittings. The modification matches past actions in the IPC and what was done by previous committee in M87-21. (Vote: 11-0)

Final Hearing Results

M88-21 AM

M89-21

Original Proposal

IMC: 1203.3.4

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

2021 International Mechanical Code

Revise as follows:

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free from moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D2235 for ABS joints.
2. ASTM F493 for CPVC joints.
3. ASTM D2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D2846.

Exception: For CPVC pipe joint connections, a primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.
2. The solvent cement is yellow or green in color.
3. The solvent cement is used only for joining $^{1}/_{2}$-inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings.
4. The CPVC pipe or fittings are manufactured in accordance with ASTM D2846.

Reason: Currently, it can be difficult to see the yellow solvent cement ring on a tan CTS CPVC joint during inspection. A high contrast cement has been asked for from the field to aid in the inspection of CPVC joints. The color green was chosen because of its high contrast against the tan pipe and fittings and green is not currently used to identify any other type of cement.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The addition of another one-step solvent cement color will not change the cost of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because it adds different type color for allowed glue, which is better for inspection, and is consistent with IRC and IPC actions. (Vote: 11-0)

Final Hearing Results

M89-21 AS

M90-21

Original Proposal

IMC: 1203.9, 1203.9.1

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Delete without substitution:

~~**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 1203.9.1.~~

~~**1203.9.1 Heat-fusion joints.** Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean and free from 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.~~

Reason: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015. The referenced product standard, ASTM D3309 “Polybutylene (PB) Plastic Hot- and Cold-Water Distribution Systems” was withdrawn in 2010.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s, and PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because the material is no longer manufactured. (Vote: 11-0)

Final Hearing Results

M90-21 AS

M91-21

Original Proposal

IMC: 1203.14 (New), 1203.15 (New)

Proponents: Lisa Reiheld, Viega LLC, Viega LLC (lisa.reiheld@viega.us)

International Mechanical Code

2021 International Mechanical Code

Add new text as follows:

1203.14 Stainless Steel Pipe. Joints between stainless steel pipe or fittings shall be mechanical joints that are made with an approved elastomeric seal, or shall be threaded or welded joints conforming to Section 1203.3.

1203.15 Stainless Steel Tubing. Joints between stainless steel tubing or fittings shall be mechanical or welded joints conforming to Section 1203.3.

Reason: Stainless steel pipe and tubing are not currently recognized in the IMC as materials for use in hydronic applications. However, these materials are often specified for use in hydronic applications and are selected due to the corrosion resistance provided by stainless steel. The inclusion of stainless steel pipe and tubing in the body of this code for hydronic applications will allow the specifier and/or installer the option to use a much more corrosive resistant material for applications where this is important to the integrity of the hydronic installation. IMC Section 1203 Joints and Connections, specifies particular materials that can be joined in hydronic applications and currently includes steel but not stainless steel. Stainless steel pipe and tubing joints are being added to replicate their use as equivalent to Sections 1203.12 Steel pipe and 1203.13 Steel tubing for joints as well as state the suitable equivalent methods of joining as stated for Steel pipe and tubing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal of including stainless steel as another recognized material for the use in hydronic systems will not increase the cost of construction due to the fact that stainless steel piping and tubing would be only one of multiple material options the user of the code could specify.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted based on proponents statement indicating that the addition of stainless steel pipe and tubing for hydronic applications is appropriate and gives the designer additional options. (Vote: 11-0)

Final Hearing Results

M91-21 AS

M92-21

Original Proposal

IMC: 1205.1

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

2021 International Mechanical Code

Revise as follows:

1205.1 Where required. Shutoff valves shall be installed in hydronic piping systems in the locations indicated in Sections 1205.1.1 through 1205.1.6. Access shall be provided to all full open valves and shutoff valves.

Reason: Although Section 306.1 alludes to access for devices if you want to call a valve a device, it doesn't just come out and include valves. This change will make it clear that valves will be required to have access.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change is editorial in nature is done for consistency purposes only.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted because it adds clarification. If you have a valve, you would want to have access to it. (Vote: 11-0)

Final Hearing Results

M92-21 AS

M93-21

Original Proposal

IMC: 1210.4, TABLE 1210.4

Proponents: Michael Cudahy, PPFA, PPFA (mikec@cmservices.com)

2021 International Mechanical Code

1210.4 Piping and tubing materials standards. Ground-source heat pump ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

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; ASTM F3253; CSA B137.5; CSA C448; 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; CSA C448; NSF 358-4

Reason: ASTM F3253 is titled, "Standard Specification for *Crosslinked Polyethylene (PEX) Tubing* with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems" and contains information for PEX systems for hydronic applications where an oxygen barrier is used. This standard for PEX tubing and fittings is already included in the hydronics fittings table and is missing in the piping table, so we are correcting its absence.

Bibliography: ASTM F3253 is already included in the code.

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. The proposal simply adds an additional ASTM standard for inclusion of approved PEX piping. There is not expected to be an increase or decrease in construction costs by the inclusion of another approved piping material defined by the ASTM product standard for tubing to this section of the code. This standard is for PEX tubing and fittings and is already included in the hydronics fittings table and is only missing in the piping table.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee approved this proposal because it adds ASTM F3253 titled, "Standard Specification for *Crosslinked Polyethylene (PEX) Tubing* with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems" and contains information for PEX systems for hydronic applications where an oxygen barrier is used by Boiler/ Hydronic manufacturer to prevent rusting inside. (Vote: 11-0)

Final Hearing Results

M93-21 AS

M95-21

Original Proposal

IMC: 1209.1

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Revise as follows:

1209.1 Materials. Piping for heating panels shall be standard-weight steel pipe, Type L copper tubing,~~polybutylene~~ or ~~other~~ *approved* plastic pipe or tubing rated at 100 psi (689 kPa) at 180°F (82°C).

Reason: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted based on previous actions regarding materials no longer being used. (Vote: 11-0)

Final Hearing Results

M95-21 AS

M96-21

Original Proposal

IMC: 1209.3.3

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Delete without substitution:

~~**1209.3.3 Polybutylene joints.** Polybutylene pipe and tubing shall be installed in continuous lengths or shall be joined by heat fusion in accordance with Section 1203.9.1.~~

Reason: Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Polybutylene (PB) tubing has not been manufactured for sale in the US since the late 1990s. PB was previously removed from Table 1202.4 “Hydronic Pipe” at some time before 2015.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because the language removes product that no longer is being used and is consistent with previous actions. (Vote: 11-0)

Final Hearing Results

M96-21 AS

M97-21

Original Proposal

IMC: 1209.6 (New), 1209.6.1 (New), TABLE 1209.6.1 (New), 1209.6.2 (New), 1209.6.3 (New)

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Add new text as follows:

1209.6 Radiant tubing placement. Hydronic tubing to be embedded for the purpose of radiant heating or cooling shall be installed in accordance with the manufacturer's instructions and with the tube layout and spacing in accordance with the system design. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.

1209.6.1 Radiant tubing circuit length. The maximum circuit length of radiant tubing from a supply-and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer's specifications, the lengths specified in Table 1209.6.1.

TABLE 1209.6.1 MAXIMUM CIRCUIT LENGTH OF RADIANT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT

NOMINAL TUBE SIZE	MAXIMUM CIRCUIT LENGTH (FEET)
1/4	125
5/16	200
3/8	250
1/2	300
5/8	400
3/4	500
1	750

For SI units: 1 foot = 304.8 mm

1209.6.2 Radiant tubing circuit tags. Each individual radiant tubing circuit shall have a tag or label securely affixed to each manifold outlet to indicate the length of each circuit and the areas served.

1209.6.3 Radiant tubing drawings. The radiant tubing drawings and design report shall be provided to the building owner or the designated representative of the building owner.

Reason: Manufacturers of radiant heating and cooling tubing recognize that the proper installation of radiant heating and cooling tubing is critical to the successful operation of these systems. One of the most fundamental aspects of installation is the length of each tubing circuit, because if installed lengths are too short or too long, or not labelled, it may be impossible to balance the radiant system correctly for proper operation, comfort and efficiency. For tubing that is to be embedded, this topic is critical, yet is very inspectable and enforceable.
The circuit lengths in the proposed Table 1209.1 are based on existing industry practices, and take into account the allowable temperature gain or loss from the hydronic fluid, and the typical pressure loss in radiant circuits of those diameters. These values match those found in other codes.

The proposed language makes it clear that tubing circuit lengths are to be installed according to system design or the default Table 1209.1 and are to be inspected for such compliance.

Also, it is important for radiant tubing circuits to be tagged or labelled, and for the final drawings/design to be given to the building owner, in case the tubing routing and locations need to be identified at a later date.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed code sections are based on existing industry practices used by trained experienced professionals, and do not alter the design or construction of radiant systems.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: Although there were some concerns over the clarity of the language, the content of the design report and the need for design documents, the committee approved the proposal because most times systems are designed with maximum lengths depending on the square footage of a room. (Vote: 6-5)

Final Hearing Results

M97-21 AS

M98-21

Original Proposal

IMC: 1209.7 (New), 1209.7.1 (New), TABLE 1209.7.1 (New), 1209.7.2 (New)

Proponents: Lance MacNevin, Director of Engineering – Building & Construction Division, Plastics Pipe Institute, Plastics Pipe Institute (lmacnevin@plasticpipe.org)

2021 International Mechanical Code

Add new text as follows:

1209.7 Snow & ice melt tubing placement. Hydronic tubing to be embedded for the purpose of snow & ice melt systems shall be installed in accordance with the manufacturer's installation instructions and with the tube layout and spacing in accordance with the system design.

1209.7.1 Snow-and ice-melt tubing circuit length. The maximum circuit length of snow- and ice- melt tubing from a supply-and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer's specifications, the lengths specified in Table 1209.7.1. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.

TABLE 1209.7.1 MAXIMUM CIRCUIT LENGTH OF SNOW- AND ICE-MELT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT

NOMINAL TUBE SIZE	MAXIMUM CIRCUIT LENGTH (FEET)
1/2	140
5/8	250
3/4	325
1	475

For SI units: 1 foot = 304.8 mm

1209.7.2 Snow- and ice-melt tubing drawings. The snow- and ice-melt tubing drawings and design report shall be provided to the building owner or the designated representive of the building owner.

Reason: Manufacturers of snow & ice melt (SIM) system tubing recognize that the proper installation of this tubing is critical to the successful operation of these systems. One of the most fundamental aspects of installation is the length of each tubing circuit, because if installed lengths are too short or too long, it may be impossible to balance the system correctly for proper operation, efficiency and safety. For tubing that is to be embedded, this topic is critical, yet is very inspectable and enforceable.
The circuit lengths in the proposed Table 1209.2 are based on existing industry practices, and take into account the allowable temperature loss from the hydronic fluid and the typical pressure loss in snow & ice melt circuits of those diameters. The actual lengths are based on the typical on-center spacing of tubing in a SIM system and the typical heat energy required per square foot of outdoor area. These values match those found in other codes.

The proposed language makes it clear that tubing circuit lengths are to be installed according to system design or the default Table 1209.2 and are to be inspected for such compliance.Also, it is important that the final drawings/design be provided to the building owner in case the tubing routing and locations need to be identified at a later date.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposed requirements are based on existing industry practices, and match those found in other codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because heating lengths will be different depending on systems and locations. +/- 10% will not affect the performance of the system. (Vote: 8-3)

Final Hearing Results

M98-21 AS

M99-21 Part I

Original Proposal

IMC: TABLE 1210.5, TABLE 1202.5, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, PPFA, PPFA (mikec@cmservices.com)

THIS IS A TWO PART CODE CHANGE. PART I WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART II WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

2021 International Mechanical Code

Revise as follows:

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;ASTM F3347; CSA B137.5; CSA C448; 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;ASTM F3347; CSA B137.1; CSA B137.18; CSA C448; NSF 358-4

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 B16.24; ASME B16.26; 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; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
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;ASTM F3347; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253;ASTM F3347
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; 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

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

F3347-20a — Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Reason: ASTM F3347 is titled, "Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information for metallic fittings for both PEX and PERT systems intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3347 Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

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. The proposal simply adds an additional ASTM standard

for inclusion of approved PEX and PERT fitting products and is therefore not expected to either raise or lower the cost of construction by offering another potential product to the application, it only increases additional options.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was passed as submitted based on the proponent reason statement. ASTM F3347 is titled, "Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information for metallic fittings for both PEX and PERT systems intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems. (Vote: 11-0)

Final Hearing Results

M99-21 Part I AS

M99-21 Part II

Original Proposal

IRC: TABLE P2906.6, TABLE M2101.1, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, PPFA, PPFA (mikec@cmservices.com)

2021 International Residential Code

Revise as follows:

TABLE P2906.6 PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; ASTM F3347; CSA B137.5
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53
Malleable iron	ASME B16.3
Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Polyethylene (PE) plastic	ASTM D2609; CSA B137.1
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; ASTM F3347; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L) pipe	ASTM A312; ASTM A778
Stainless steel (Type 316/316L) pipe	ASTM A312; ASTM A778
Steel	ASME B16.9; ASME B16.11; ASME B16.28

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, ASTM B43, ASTM 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, ASTM B88, ASTM B135, ASTM B251, ASTM 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; ASTM F3253	(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; ASTM F3347	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 B137.9	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, ASTM F3347; 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.

Add new standard(s) as follows:

ASTM

ASTM
International 100 Barr Harbor Drive,
P.O. Box C700 West Conshohocken,
PA 19428

ASTM F3347	Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Reason: ASTM F3347 is titled, "Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing and contains information for metallic fittings for both PEX and PERT systems intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3347, Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal adds a standard for PEX and PERT fittings and is not expected to increase or decrease the costs of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This new standard provides another option for hydronic piping. (11-0)

Final Hearing Results

M99-21 Part II AS

M100-21 Part I

Original Proposal

IMC: TABLE 1210.5, TABLE 1202.5, ASTM Chapter 15 (New)

Proponents: Michael Cudahy, PPFA, PPFA (mikec@cmservices.com)

THIS IS A TWO PART CODE CHANGE. PART 1 WILL BE HEARD BY THE MECHANICAL CODE COMMITTEE. PART 2 WILL BE HEARD BY THE INTERNATIONAL RESIDENTIAL MECHANICAL/PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

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;ASTM F3348; CSA B137.5; CSA C448; 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;ASTM F3348; CSA B137.1; CSA B137.18; CSA C448; NSF 358-4

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 B16.24; ASME B16.26; 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; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53
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;ASTM F3348; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253;ASTM F3348
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; 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

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428

ASTM F3348-20b — Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Reason: ASTM F3348 is titled, "Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information on plastic fittings for PEX and PERT systems and should be included in the fittings table. The fittings are intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3348 Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

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. The proposal simply adds an additional ASTM standard for inclusion of approved PEX and PERT fitting products and is therefore not expected to either raise or lower the cost of construction by offering another potential product to the application, it only increases additional options.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because it appropriately adds an additional standard for materials that can be used. (Vote: 11-0)

Final Hearing Results

M100-21 Part I AS

M100-21 Part II

Original Proposal

IRC: TABLE M2101.1, ASTM Chapter 44 (New)

Proponents: Michael Cudahy, PPFA, PPFA (mikec@cmservices.com)

2021 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, ASTM B43, ASTM 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, ASTM B88, ASTM B135, ASTM B251, ASTM 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; ASTM F3253	(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; ASTM F3348	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 B137.9	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, ASTM F3348; 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.

Add new standard(s) as follows:

ASTM

ASTM
International 100 Barr Harbor Drive,
P.O. Box C700 West Conshohocken,
PA 19428

F3348-18 Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Reason: ASTM F3348 is titled, "Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" and contains information on plastic fittings for PEX and PERT systems and should be included in the fittings table. The fittings are intended for use in residential and commercial, hot and cold, potable water distribution systems as well as sealed central heating, including under-floor heating/cooling systems, and residential fire sprinkler systems.

Bibliography: ASTM F3348 Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

Cost Impact: The proposal adds a standard for PEX and PERT fittings and is not expected to increase or decrease the costs of construction.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The Committee agreed with the published reason statement. (11-0)

Final Hearing Results

M100-21 Part II AS

M101-21

Original Proposal

IMC: 1210.6

Proponents: Lisa Reiheld, Viega LLC, Viega LLC (lisa.reiheld@viega.us)

2021 International Mechanical Code

Revise as follows:

1210.6 Joints. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground-source loop system. Joints used underground shall be of an approved type for buried applications.

Reason: The use of the word "approved" by itself by definition in the IMC indicates being approved the Authority Having Jurisdiction. Modifying this language to indicate that it is of an "approved type" indicates that it is listed to a standard that has been approved for this type of product rather than at the discretion of the AHJ.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This does not increase or decrease the cost but merely clarifies the type of approval necessary for underground installation.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has been approved as submitted because it clears up confusion of what is an approved type of joint used underground and whether the authority having jurisdiction needs to approve the joint. (Vote: 11-0)

Final Hearing Results

M101-21 AS

ADM1-22 Part I

Original Proposal

IBC: SECTION 202; IEBC: SECTION 202 (New); IFC: SECTION 202; IFGC: SECTION 202 (New); IMC: SECTION 202 (New); ISPSC: SECTION 202 (New)

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

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

[A] LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or
services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. Terms that are used to identify listed equipment, products, or materials include “listed”, “certified”, “classified” or other terms as determined appropriate by the listing organization.

Reason: The proposed revision to the definitions for “Listed” recognizes that listing organizations may use other terms to identify “listed” equipment, products, or materials. Two examples of other terms used meet the definition of listed include “certified” and “classified”. The term “certified” is a more globally recognized term used by listing organizations compared to the term “listed”. The term “classified” has historically referred to building materials evaluated for specific performance aspects such as surface burning characteristics that has also been accepted by code officials as meeting the definition of “Listed".

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is simply modifying the existing definitions of Listed, and adding a definition of Listed where one does not exist.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee stated that the reason for approval was that the addition of the terminology improves the definition and is something that is needed. (Vote: 8-5)

Final Hearing Results

ADM1-22 Part I AS

ADM14-22

Original Proposal

IMC: SECTION 104, 202; IFGC: SECTION 104, SECTION 105, 202; IPC: SECTION 104, 202; ISPSC: SECTION 104, 202; IPSDC: SECTION 104, 202

Proponents: Kevin Scott, KH Scott & Associates LLC, KH Scott & Associates LLC (khscottassoc@gmail.com)

Primary sections and titles shown as deleted include the deletion of all sections and subsections within them. For clarity, the full text of these deletions are not shown.

2021 International Mechanical Code

Revise as follows:

[A] APPROVED AGENCY. An established and recognized ~~agency~~ organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such ~~agency~~ organization has been approved by the code official.

Add new definition as follows:

PEER REVIEW. An independent and objective technical review conducted by an approved third party.

Revise as follows:

~~SECTION 104~~
~~DUTIES AND POWERS OF THE CODE OFFICIAL~~
(Delete entire section and replace as follows)

Add new text as follows:

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

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

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies, procedures, rules and regulations in order to clarify the application of this code's provisions. Such interpretations, policies, procedures, rules and regulations:

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

104.2.1 Listed compliance. Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.

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

[A] 104.2.2.1 Cost. A technical opinion and report shall be provided without charge to the jurisdiction.

[A] 104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization acceptable to the code official. The code official is authorized to require design submittals to be prepared by and bear the stamp of a registered design professional.

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

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

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

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

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

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

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

1. Quality
2. Strength
3. Effectiveness
4. Durability
5. Safety

[A] 104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 104.2.3.5 Tests. Tests conducted to demonstrate equivalency in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

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

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products.

The alternate material, design or method of construction and product evaluated shall be within the scope of accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report, developed using a process that includes input from the public and made available for review by the public.

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

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

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

[A] 104.2.4.1 Flood hazard areas. The code official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.3 unless a determination has been made that:

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

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

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

[A] 104.4 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or on a premises a condition that is contrary to or in violation of this code that makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at all reasonable times to inspect or to perform the duties imposed by this code. If such structure or premises is occupied, the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, the owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to every remedy provided by law to secure entry.

[A] 104.4.1 Warrant. Where the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent or occupant or person having charge, care or control of the building or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

[A] 104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

[A] 104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code in accordance with Section 114.

[A] 104.7 Official records. The code official shall keep official records as required by Sections 104.7.1 through 104.7.5. Such official records shall be retained for not less than 5 years or for as long as the building or structure to which such records relate remains in existence, unless otherwise provided by other regulations.

[A] 104.7.1 Approvals. A record of approvals shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.

[A] 104.7.2 Inspections. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.7.3 Code alternatives and modifications. Application for alternative materials, design and methods of construction and equipment in accordance with Section 104.2.3; modifications in accordance with Section 104.2.4; and documentation of the final decision of the code official for either shall be in writing and shall be retained in the official records.

[A] 104.7.4 Tests. The code official shall keep a record of tests conducted to comply with Sections 104.2.2.4 and 104.2.3.5.

[A] 104.7.5 Fees. The code official shall keep a record of fees collected and refunded in accordance with Section 109.

[A] 104.8 Liability. The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be personally liable, either civilly or criminally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

[A] 104.8.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties under the provisions of this code or other laws or ordinances implemented through the enforcement of this code shall be defended by legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 104.9 Approved materials and equipment. Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

[A] 104.9.1 Material and equipment reuse. Materials, equipment and devices shall not be reused unless such elements are in good working condition and approved.

Reason: Section 104 appears in the IMC, IFGC, IPC, ISPSC and IPSDC and contains general requirements for the authority and duties of the code official. Among these authorities and duties is the review and approval of alternate methods. The primary purpose of this code change is to update Section 104 to reflect the current manner that alternate methods and materials are evaluated, and to differentiate between evaluations from accredited evaluation agencies and evaluations from others, such as engineers. These provisions have basically been the same since the first edition in 2000, with the exception that the section on "Research Reports" was added in 2003. Industry terminology and methods have evolved over the years.

This proposal revises general code enforcement provisions to improve organization, improve clarity, and supplement existing provisions to better align the code text with how the code is commonly applied. The end goal is to provide the same wording and procedures in all of the I-Codes with regard to the Duties and Responsibilities of the Code Official. Some of the codes contain unique provisions applicable to only that code. Those nuances are retained so there are some slight differences, but the formatting will be the same in each code and the language will generally be the same in each code.

A separate code change proposal was submitted for the IFC, IWUIC, IBC, IEBC, IRC, IgCC and IPMC. The proposals are separate, however, the content and purpose is the same. Time restraints did not allow for this package to be reviewed by the PMG CAC. Therefore, it is submitted separately, however the content and format is identical.

As stated earlier, this section has been in the code a long time, and it is believed that it initially envisioned an alternative product or method review and approval process on a project-by-project basis, with substantiating tests and calculations or analyses provided with each permit application. Currently, a more efficient system has evolved where the same product evaluation reports are used in numerous projects, across many jurisdictions, and for many conditions. This evolution causes the need to revise this section to reflect current procedures.

However, the need for designers to be able to apply for one-time approval needs to be maintained, and that is the reason that "research reports" is maintained. In this case, though, when a method or material is not addressed by the code, the code official needs more information on the process that the evaluator used to determine that the method or material complies with the intent of the code.

To achieve the common format, a template is shown below which includes comments on each of the sections. Since the wording in each code is intended to be the same, the outline is not shown for every code, however there is an underline/strikeout version for each code provided. The code change for each code is provided as delete and substitute. This was done because the autoformatting process in cdpACCESS did not provide a document to easily follow. The underline/strikeout versions show the specific changes.

The following template is from the IBC. The IMC, IFGC, IPC, ISPSC and IPSDC provisions are formatted the same as this template, however some codes have additional unique provisions, and other codes don't contain all of these sections if they are not appropriate for the code content. This is the same template used for the other code change for the remaining I-Codes.

OUTLINE FOR PROPOSED SECTION 104

SECTION 104 DUTIES AND POWERS OF BUILDING OFFICIAL – same title used for each code

104.1 General. – This section has been subdivided with numbered/titled subsections to break up the existing paragraph and specifically state that the code official is authorized to determine compliance with the code. While always implied and applied in this manner, the code never specifically states this important fact.

104.2 Determination of Compliance. – reformatted to identify that when reviewing projects for compliance with the code, the code official can develop policies and procedures. It also specifically states that the developed policies and the project approvals are to be based on the intent of the code.

104.2.1 Listed compliance. – In cases where the code specifies a listing standard, it is common for a code official to accept things listed to that standard without further evaluating whether the standard is germane. When a product listing is appropriate, then the fact that the product is listed and installed in accordance with the listing specifications and the manufacturer's instructions becomes the approval of the product. This section is not included in all codes since not all codes require listed equipment.

104.2.2 Technical assistance. – Nearly all the codes provide for the code official to utilize technical assistance in some form or another. This section is included as a subsection for determining compliance and will be consistent throughout the I-Codes. It is derived from, and replaces, previous text that was originally developed for and limited to hazardous materials related provisions.

104.2.2.1 Cost. – the cost for technical assistance is borne by the applicant or owner. This was previously included in a preceding paragraph and has been separated into its own subsection.

104.2.2.2 Preparer qualifications. – states that the person or agency providing the technical report must be qualified. The code official has the ability to require that the report is stamped by a registered design professional, since not all reports may need to provide this. For example, a hazardous materials classification report often does not include engineering or design. The definition is added to codes that do not currently contain the definition, such as the IWUIC. This was previously included in a preceding paragraph and has been separated into its own subsection. The new text goes beyond simply recommending changes, recognizing that the report may be a source document, as opposed to a review of documentation prepared by others.

104.2.2.3 Content. – the technical report shall include an analysis and any recommended or necessary changes.

104.2.2.4 Tests. – Tests can often provide valuable information. Where a test standard isn't specified by this code or a reference standard, the code official may wish to conduct further evaluation of the suitability of the test method used as a basis. Testing can be performed by an approved agency or by any other party/organization approved by the code official. Proposed provisions for tests are largely derived from existing code text on this topic.

104.2.3 ~~104.11~~ Alternative materials, design and methods of construction and equipment. – All codes make reference to accepting some type of alternative. This section is placed under the general compliance approval section and revised to state that a proposed alternative cannot be something that is specifically prohibited by the code. If ICC members have previously voted to specifically disallow something, alternative methods should not be a means of avoiding such a prohibition. Nevertheless, a code modification would still provide an option to make exceptions for unique cases, as opposed to the door being open for an applicant to end run the intent of the code by presenting an analysis or alternative that suggests an alternative to a prohibition is OK. It is important to note that something not contemplated by the code would not be impacted by this statement. Not contemplated is not the same as a specific prohibition in the code.

104.2.3.1 Approval authority. – if the alternative is acceptable, then it is to be approved by the code official. This is from existing text.

104.2.3.2 Application and disposition. – the submittal for an alternative must be accomplished in writing. If it is not approved, the code official must so state in writing and provide reasons why it was not acceptable. This is largely from existing text, however, the requirement for a written application for alternatives was not previously located in this section, where it is appropriate to reference.

104.2.3.3 Compliance with code intent. – the alternative must comply with the code's intent.

104.2.3.4 Equivalency criteria. – the alternative must provide equivalency to the code's provisions. The list of characteristics to be addressed is included from the current code. The reference to fire-resistance is removed from the list and fire-resistance is included under safety with additional criteria regarding fire characteristics identified in Section 104.2.3.4.1.

104.2.3.4.1 Fire safety equivalency. – this section was added because "fire-resistance" was removed from the list in Section 104.2.3.4 and recognizing that fire-resistance is not the only fire related characteristic to be addressed. Fire-resistance is only one characteristic of safety with respect to fire. This section is added to clarify that the entire issue of performance under fire conditions is the concern. Previously, aspects of fire safety beyond fire resistance would have been evaluated as part of "safety" in the list with no additional guidance on what to consider. Performance under fire conditions also includes equivalency as to how the alternate will perform structurally when exposed to fire.

104.2.3.5 Tests. – this section is added so the code official can ensure that any testing conducted is performed to a scale that adequately represents the end use of the alternate. This has primarily been added in response to concerns related to Code Change F60-21, which modified Section 2603 to defer alternatives related to fire performance of foam plastics to Section 104.

104.2.3.6 ~~104.11.1 Research~~ Reports. This section is relocated and revised to address two different types of reports currently submitted for alternatives.

104.2.3.6.1 Evaluation reports. – This section is added to address reports generate by an approved agency. The definition of "approved agency" was added to several codes in the 2018 editions. The definition is proposed to be revised, as in the IBC, or added as a new definition codes do not contain this definition, as in the IFC. This evaluation report is conducted by an approved agency that is accredited to conduct the tests or evaluations appropriate for the alternative involved. When the applicant provides a product evaluation from an accredited product evaluation agency that uses publicly developed and available criteria for the evaluation, the code official may have increased confidence that the method used for the evaluation does result in a method or material that meets the intent of the code and is at least equivalent to code-prescribed construction. Public development of criteria allows for input from industry experts, the public, and building officials in determining the methods used to evaluate code intent and equivalence, somewhat similar to the code development process where consensus is important. The accreditation ensures that the organization uses a consistent process to perform the evaluations. This section is meant to reflect the current use of evaluation reports from accredited evaluation agencies or organizations.

104.2.3.6.2 Other reports. – this section is added to address reports generated by persons or agencies other than an approved agency. It specifies that the person or agency providing the report must be qualified and must be approved by the code official. The code official has the authority to require the stamp of a registered design professional. When an applicant provides an evaluation from other than an accredited agency, or from a source that does not use publicly developed and available criteria, the code official needs more information in order to perform a proper review. Not only does the code official need to evaluate the product, but also evaluate the method that the applicant has used to determine compliance with code intent and code equivalence. So, in that case, it is proposed that the applicant would also have to provide the criteria that was used to do the evaluation, justification for use of that criteria, and data used for the evaluation, so a

complete review can be made.

104.2.3.7 Peer review. – this section is added to address a method of review currently utilized by many jurisdictions. The peer review is an outside, third-party review that is submitted to the code official for use in cases where a jurisdiction may not have qualified resource in-house to perform a sufficient review of an alternative compliance proposal. Again, the peer reviewer must be qualified and approved by the code official.

104.2.4 ~~104.10~~ Modifications. – this section is relocated under the section of compliance. Minor edits occurred to provide consistent language throughout the codes.

104.3 ~~104.2~~ Applications and permits. – this section is relocated and revised to provide consistent wording.

~~104.4Inspections.~~ – this section is relocated to 104.2.2. Some of the language in this section is not relocated since those portions are already covered in Section 110.104.4 ~~104.6~~ Right of entry. – This section is relocated and revised to provide consistent wording. The issue of right of entry is the same with all enforcement issues.

104.4.1 Warrant. – this section was not found in all codes, so it was added to the IBC to provide the ability to utilize a warrant. This function is allowed by the courts and currently utilized by jurisdictions.

104.5 Identification. – no change

104.6 ~~104.3~~ Notices and orders. – relocated and revised for consistent wording.

104.7 ~~Department~~ Official records. – This section revised to provide consistent wording and is reformatted by creating subsections. Each subsection addresses a different type of record that the is to be retained. This format clarifies that these records are required to be maintained.

104.7.1 Approvals.

104.7.2 Inspections.

104.7.3 Code alternatives and modifications.

104.7.4 Tests.

104.7.5 Fees.

104.8 Liability. – this section deals with protection from liability of the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.8.1 Legal defense. – this section deals with legal defense for the code official. The sections are revised to provide consistent wording throughout all I-Codes.

104.9 ~~105.5~~Approved materials and equipment. – no change

104.9.~~1105.4 Used materials~~ Material and equipment reuse. – this section addresses the reuse of materials and equipment. The section is revised to provide consistent wording throughout the codes to say that the code official must approve any materials to be reused.

~~104.10 Modifications~~ – this section is relocated to 104.2.4 for formatting.

~~104.11 Alternative materials, design and methods of construction and equipment.~~– this section is relocated to 104.2.3 for formatting.

~~104.11.1 Research reports.~~ – this section is relocated to 104.2.3.6 for formatting.

~~104.11.2 Tests.~~ – this section is relocated 104.2.2.4, 104.2.3.5 and 104.8.4 for formatting.

Additional unique changes are as follows:

1. Sections in IMC 105 are relocated to IMC 104, so Section 105 is deleted. This also occurs in the IFGC and IPSDC.
2. A minor change was made to the definition of “approved agency” which removes the repeat of the word that is to be defined, agency, and replaces it with organization. Another revision allows the agency to furnish product evaluation in addition to certification, since evaluation and certification are two different things. Evaluation is for materials and methods not addressed by the code, and certification is for materials and methods that are addressed by the code.

A strikeout/underline version of each code follows to identify specific revisions.

The proposal in strikeout and underline text format can be viewed here:

https://www.cdpaccess.com/proposal/8835/25768/files/download/3016/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a reformatting and clarification of the requirements already in the codes.

Public Hearing Results

Committee Action **As Modified**

The complete approved proposal including all of the approved committee modifications can be viewed in cdpACCESS as the public comment ready version.

https://www.cdpaccess.com/proposal/8835/26739/preview/

Committee Modification: 2021 International Mechanical Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

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

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

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

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

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

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

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

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

6. Fire safety

[A]104.2.3.4.1 Fire safety equivalency. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

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

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency accredited to evaluate or certify products and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition accreditation of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official, developed using a process that includes input from the public and made available for review by the public.

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

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits for the erection, and alteration, demolition and moving of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render

interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

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

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

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

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

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

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

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

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

6. Fire safety

~~[A]104.2.3.4.1 Fire safety equivalency~~. ~~Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also~~

~~include a structural system analysis.~~

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

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

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

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

2021 International Plumbing Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

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

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

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to~~

~~be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

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

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

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

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

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

6. Fire safety

~~[A]104.2.3.4.1 Fire safety equivalency~~. ~~Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

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

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

[A] 104.2.3.6.2 Other reports. Reports not complying with Section 104.2.3.6.1 shall describe criteria, including but not limited to any referenced testing or analysis, used to determine compliance with code intent and justify code equivalence, including but not limited to any referenced testing or analysis. The report shall be prepared by a qualified engineer, specialist, laboratory or specialty organization

acceptable to the code official. The code official is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

2021 International Swimming Pool and Spa Code

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

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

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

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

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

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

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

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

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

6. Fire safety

[A]104.2.3.4.1 Fire safety equivalency. ~~Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

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

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

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

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

[A] 104.2 Determination of compliance. The code official shall have the authority to determine compliance with this code, to render interpretations of this code and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of this code's provisions. Such interpretations, policies~~,~~ and procedures~~, rules and regulations~~:

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

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

~~Determination of compliance for anything required by this code, or a reference standard, to be listed shall be based on a test standard or approved listing evaluation that is germane to the provision requiring the listing. Anything required by this code, or a reference standard, to be listed shall be installed in accordance with the listing and the manufacturer's instructions. Copies of the listing standard and manufacturer's instructions shall be made available to the code official upon request.~~

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

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

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

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

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

6. Fire safety

~~**[A]104.2.3.4.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

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

[A] 104.2.3.6.1 Evaluation reports. Evaluation reports shall be issued by an approved agency~~accredited to evaluate or certify products~~ and use of the evaluation report shall require approval by the code official for the installation. The alternate material, design or method of construction and product evaluated shall be within the scope of the code official's recognition ~~accreditation~~ of the approved agency. Criteria used for the evaluation shall be identified within the report and where required, provided to the code official~~, developed using a process that includes input from the public and made available for review by the public~~.

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

[A] 104.3 Applications and permits. The code official shall receive applications, review construction documents and issue permits ~~for the erection, and alteration, demolition and moving of buildings and structures~~, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

[A]104.6 Notices and orders. The code official shall issue necessary notices or orders to ensure compliance with this code. Notices of violations shall be in accordance with Section 114.

[A] 104.7.2 Inspections. The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

Committee Reason: The committee stated that the reason for the approval of the modifications and proposal was based on correlation and consistency with the action taken on ADM13-22 Part I. (Vote: 9-4)

Final Hearing Results

ADM14-22 AM

ADM34-22 Part I

Original Proposal

IEBC: [A] 104.11, [A] 104.11.1; IFC: [A] 104.10, [A] 104.10.1; IFGC: [A] 105.2, [A] 105.2.1; IMC: [A] 105.2, [A] 105.2.1; IPC: [A] 105.2, [A] 105.2.1; IPMC: [A] 106.2, [A] 106.6; IPSDC: [A] 105.2, [A] 105.2.1; ISPSC: [A] 104.10, 104.10.1 (New); IWUIC: [A] 105.3, 105.3.1 (New); IGCC: 105.4, 105.4.1

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org); Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment.
The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code, ~~and that~~
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code ~~in~~ as it pertains to the following:
   2.1. Quality, ~~,~~
   2.2. Strength, ~~,~~
   2.3. Effectiveness, ~~,~~
   2.4. Fire effectiveness, ~~,~~
   2.5. Durability ~~and~~
   2.6 Safety.

Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

[A] 105.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

Reason: ADM19-19 modified IBC Section 104.11, but did not make the same suggestion across all the codes. The changes to this section were primarily formatting, with some slight reordering. This same change to be applicable to all the codes. It was also noted that not all of the codes included a subsection on research reports as an aid to alternative approval.
This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) and . ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes

with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021, the PMGCAC has held several virtual meetings open to any interested party. 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 is primarily a format change.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee stated that the reason for approval was that it is very similar to the previous changes made in Section 104.11 for alternate materials and it provides consistency in the codes. (Vote: 11-2)

Final Hearing Results

ADM34-22 Part I AS

ADM35-22

Original Proposal

IBC: [A] 104.11; IEBC: [A] 104.11; IFC: [A] 104.10; IFGC: [A] 105.2; IMC: [A] 105.2; IPC: [A] 105.2; IPSDC: [A] 105.2

Proponents: David Collins, The Preview Group, Inc, Self (dcollins@preview-group.com); Ronald Geren, RLGA Technical Services, LLC, The American Institute of Architects (ron@specsandcodes.com); Paul Karrer, The American Institute of Architects, The American Institute o Architects (paulkarrer@aia.org)

2021 International Mechanical Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be*approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not*approved*.

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

Reason: The ICC Performance Code (ICCPC) should not be considered solely for whole building designs, but also as another pathway for evaluating alternative materials, designs, and methods of construction. When projects are designed per the prescriptive requirements of any ICC code, there are situations where a single material, element, or system cannot conform to the prescriptive requirements. Also, new materials, elements, or systems are entering the construction market at a pace that the prescriptive codes cannot keep up. This provision will allow owners, designers and building officials to consider such advances in such materials, elements of designs using the Performance Code for guidance.

Although the prescriptive provisions in each of the codes provides one pathway for approval of alternative materials, designs, and methods of construction, the ICCPC should not be overlooked as an alternative pathway. The ICCPC may be considered by the building official as an alternative method in and of itself per any of the sections listed, by including it within the text of each section will draw much greater attention to the ICCPC and thereby increase its use and adoption.

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

This change to the above mentioned codes do not add a requirement that individual projects must comply with. It provides an additional option for those projects that wish to pursue more performance-based solutions. ICC's Cost Impact Guide cites code change proposals that modify the design requirements (e.g. greater number of design options, design process efficiencies) as recognized instance of proposals that do not affect the construction or construction cost. Providing projects a route to use the ICC Performance Code to evaluate materials, designs and methods of construction does not impact the cost of construction.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

2021 International Building Code

[A]104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to

prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code,
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following:
   2.1. Quality.
   2.2. Strength.
   2.3. Effectiveness.
   2.4. *Fire resistance*.
   2.5. Durability.
   2.6. Safety.

Where the alternative material, design or method of construction is not approved, the *building official* shall respond in writing, stating the reasons why the alternative was not approved.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*.This exception shall not apply to alternative structural materials or to alternative structural designs.

2021 International Existing Building Code

[A]104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Exception: Performance-based alternative materials, designs or methods of construction and equipment complying with the *ICC Performance Code*. This exception shall not apply to alternative structural materials or to alternative structural designs.

Committee Reason: The committee stated that the reason for the approval of the modification was that since the exception is referring to the performance code and if the performance code is not ready for structural type situations you need to have this exception in there to make sure that somebody doesn't try to use it for that purpose. The stated reasons for the approval were that this is another tool in the toolbox and owners can take advantage of this requirement and it brings more attention to it and this path especially with the modification. It was additionally stated that this proposal and the modification are critical as it brings another type of alternative that is performance based. (Vote: 7-6)

Final Hearing Results

ADM35-22 AM

ADM36-22 Part I

Original Proposal

IBC: [A] 104.11, [A] 104.11.1 (New), [A] 104.11.2 (New), [A] 104.11.1, [A] 104.11.2; IEBC: [A] 104.11, [A] 104.11.1 (New), [A] 104.11.2 (New), [A] 104.11.1, [A] 104.11.2; IFC: [A] 104.10, [A] 104.10.1 (New), [A] 104.10.2 (New), [A] 104.10.1, [A] 104.10.2; IFGC: [A] 105.2, [A] 105.2.1 (New), [A] 105.2.2 (New), [A] 105.2.1; IMC: [A] 105.2, [A] 105.2.1 (New), [A] 105.2.2 (New), [A] 105.2.1; IPC: [A] 105.2, [A] 105.2.1 (New), [A] 105.2.2 (New), [A] 105.2.1; IPMC: [A] 106.2, [A] 106.2.1 (New), [A] 106.2.2 (New); IWUIC: [A] 105.3, [A] 105.3.1 (New), [A] 105.3.2 (New)

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, ~~fire resistance,~~ durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

Add new text as follows:

[A] 105.2.1 Fire safety equivalency.. Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.

[A] 105.2.2 Fire tests.. Tests conducted to demonstrate equivalent fire safety in support of an alternative material, design or method of construction application shall be of a scale that is sufficient to predict fire safety performance of the end use configuration. Tests shall be performed by a party acceptable to the code official.

Revise as follows:

[A] ~~105.2.1~~ 105.2.3 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

Reason: The intent of this code proposal is to clarify equivalency in terms of fire safety, which is incorrect and misleading as described simply in terms of fire resistance at present. In fact, fire resistance is only a subset of all aspects of fire safety. Therefore, it is better to have a safety analysis look at the issue of fire safety more comprehensively.
As revised, fire resistance would be deleted from the list, and a separate section added that more fully addresses fire safety. A proper fire safety analysis performed under this section should always have taken these considerations into account, but having them specifically stated, and removing the incorrect term “fire resistance” item from the list will help code officials and code users by providing more thorough guidance for preparation of alternative method proposals. Additional guidance has also been provided to ensure that fire testing done in support of an alternative method proposal is of a sufficient scale to be relevant to the end use application.

This proposal is a portion of a more wide-ranging proposal that revises the entire section 104. The language relating to the fire safety

aspects is identical to that agreed to for that proposal.

Equivalent changes are being proposed to all 9 ICC codes for which fire safety is a relevant issue in terms of alternate materials and methods.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no cost impact since this code proposal only clarifies the intent of the section and provides clearer guidance to the building, fire or code official.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
2021 International Building Code

[A]104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed alternative meets all of the following:

1. The alternative material, design or method of construction is satisfactory and complies with the intent of the provisions of this code,
2. The material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code as it pertains to the following:
   2.1. Quality.
   2.2. Strength.
   2.3. Effectiveness.
   2.4. Durability.
   2.5. Safety, other than fire safety
   2.6 Fire Safety

Where the alternative material, design or method of construction is not approved, the *building official* shall respond in writing, stating the reasons why the alternative was not approved.

~~**[A] 104.11.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Existing Building Code

[A] 104.11 Alternative materials, design and methods of construction, and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 104.11.1Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes~~

~~applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Fire Code

[A] 104.10 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *fire code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *fire code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 104.10.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Fuel Gas Code

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 105.2.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Mechanical Code

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 105.2.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Plumbing Code

[A] 105.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material or method of construction shall be *approved* where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the code official shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 105.2.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Property Maintenance Code

[A] 106.2 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 106.2.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

2021 International Wildland-Urban Interface Code

[A] 105.3 Alternative materials, design and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method shall be *approved* where the *building official* in concurrence with the fire chief finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, durability, fire safety, and safety. Where the alternative material, design or method is not *approved*, the *building official* shall respond in writing, stating the reasons why the alternative was not *approved*.

~~**[A] 105.3.1 Fire safety equivalency.** Determination of safety equivalency, with respect to fire, shall be based on an analysis that includes applicable fire safety performance properties, such as but not limited to ignitability, flame spread, heat release rate, heat of combustion, smoke development, and fire resistance. Determination of safety equivalency, with respect to structural fire safety, shall also include a structural system analysis.~~

Committee Reason: The committee stated that the reason for the approval of the modification was that proposed fire safety equivalency section is not needed in the code. The stated reason for the approval of the proposal is that it correlates with the other code changes that were previously approved. (Vote: 13-0)

Final Hearing Results

ADM36-22 Part I AM

ADM41-22 Part I

Original Proposal

IBC: SECTION 108, [A] 108.1, [A] 108.2, [A] 108.3, [A] 108.4, SECTION 112, [A] 112.1, [A] 112.2, [A] 112.3; IEBC: SECTION 107, [A] 107.1 , [A] 107.2, [A] 107.3, [A] 107.4, SECTION 111, [A] 111.1, [A] 111.2, [A] 111.3; IFC: SECTION 106 (New), 106.1 (New), 106.2 (New), 106.3 (New), 106.4 (New), SECTION 110, [A] 110.1; IFGC: SECTION 110, [A] 110.1, [A] 110.2, 110.3, SECTION 111, [A] 111.1, [A] 111.2, [A] 111.3, [A] 111.4; IMC: SECTION 107, [A] 107.1, [A] 107.2, [A] 107.3, [A] 107.4, SECTION 112, [A] 112.1, [A] 112.2, [A] 112.3; IPC: SECTION 107, [A] 107.1, [A] 107.2, [A] 107.3, [A] 107.4, SECTION 112, [A] 112.1, [A] 112.2, [A] 112.3; IPSDC: SECTION 109, [A] 109.1, [A] 109.2, [A] 109.3, [A] 109.4, SECTION 110, [A] 110.1, [A] 110.2, [A] 110.3; ISPSC: SECTION 106 (New), 106.1 (New), 106.2 (New), 106.3 (New), 106.4 (New), SECTION 109, [A] 109.1, [A] 109.2, [A] 109.3; IWUIC: SECTION 108, [A] 108.1, [A] 108.2, 108.3 (New), [A] 108.3, SECTION 112, [A] 112.1, [A] 112.2, [A] 112.3

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, Chair of PMGCAC (pmgcac@iccsafe.org); Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

SECTION 107
TEMPORARY USES, EQUIPMENT, AND SYSTEMS ~~AND USES~~

[A] 107.1 General. The code official is authorized to issue a permit for temporary uses, *equipment*, and systems ~~and uses~~. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

[A] 107.2 Conformance. Temporary uses, *equipment*, and systems ~~and uses~~ shall conform to the ~~structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary~~ requirements of this code as necessary to ensure ~~the public~~ health, safety and general welfare.

[A] 107.3 Temporary service utilities. The code official is authorized to give permission to temporarily supply service utilities in accordance with Section 112. ~~before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

[A] 107.4 Termination of approval. The code official is authorized to terminate such permit for temporary uses, *equipment*, or systems ~~or uses~~ and to order the ~~temporary *equipment*, systems or uses~~ same to be discontinued.

SECTION 112
SERVICE UTILITIES

[A] 112.1 Connection of service utilities. A person shall not make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until authorized by the code official.

[A] 112.2 Temporary connection. The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or sewer system for the purpose of testing systems or for use under a temporary approval.

[A] 112.3 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The code official shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

Reason: The purpose of this proposal is coordination between codes for the section on temporary structures. A version was proposed last cycle, ADM32-19. As requested by the development committee, the BCAC worked with FCAC and PMGCAC to develop this proposal. This proposal modified the section for temporary facilities where it was already in the code. The committee felt that it was very important to add these safety options to the IFC as well, so this proposal adds this section to IFC and ISPSC. When looking for coordination, some of the codes did not include 'structure' and some did. The residential committee felt it was important to keep 'structures', so that is remaining in the proposed text.

Generally - The word use is moved to the front, and the lists are made the same throughout.

Temporary power - The allowances for temporary connection under inspection and testing address more than just utilities, so the language in this section should match. The phrase "certificate of completion" is not defined, so "approved" would be a better choice.

The section on Conformance includes a laundry list " structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary", that is not needed for the section and includes provisions that are not addressed in all of the codes (e.g. IPC does not address structural strength, means of egress, or light).

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1) in all of the I-Codes.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) and . ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021, the PMGCAC has held several virtual meetings open to any interested party. 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 change is only removing repeating requirements, therefore this revision is strictly editorial and will not have any changes to the construction requirements.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee stated that the reason for the approval was that it coordinates the requirements for temporary structures across the codes using the same language while making it appropriate for each code. (Vote: 13-0)

Final Hearing Results

ADM41-22 Part I	AS

ADM43-22 Part I

Original Proposal

IBC: [A] 109.3; IEBC: [A] 108.3; IFC: 107.3; IFGC: 109.3; IMC: [A] 109.3; ISPSC: [A] 108.3; IWUIC: [A] 109.3; IGCC: 108.3

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org); Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

[A] 109.3 Permit valuations . The applicant for a *permit* shall provide an estimated ~~*permit*~~value of the work for which the permit is being issued at time of application. ~~*Permit* valuations shall reflect~~ Such estimated valuations shall include the total value of work, including materials and labor, for which the *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. ~~If~~ Where, in the opinion of the *code official*, the valuation is underestimated ~~on the application~~, the permit shall be denied, unless the applicant can show detailed estimates ~~to meet the approval of~~ acceptable to the *code official*. ~~Final building permit valuation shall be set by the *code official*.~~ The code official shall have the authority to adjust the final valuation for permit fees.

Reason: The intent of this proposal is to coordinate the provisions for fees in the I-codes. Last cycle there were two different proposals to address consistency in the Fees section (ADM 27-19 and ADM 33-19) – the end result was coordination between the 2021 codes. for – IBC, IFC, IEBC, IMC, IPC, IPMC, IFGC, ISPSC, IWUIC and IZC.
The revisions to Section 109.3 is based on some concerns raised during discussion. The change to the first and second sentence is a clarification of application. The cost of the permit is the value of the work being performed, not the value of the permit. The current last sentence could be read to say the code official can arbitrarily set the permit valuation, or it could be read to say the code official had to calculate the valuation. The proposed language allows for the code official to make adjustments if warranted.

There is another code change to add this section to IPC. ADM27-19 was approved last cycle for the coordination of the Fees section in IMC, IPC, IPMC, IFGC, IPSPC. This section was left out of IPC by accident. This revised text has been submitted to be added to the IPC Section 109.3.

The BCAC is working from the philosophy that ICC is a family of codes, so administrative requirements should be consistent across books. Most administrative and enforcement matters are the same for any code. Those matters unique for a specific code remain unchanged. This is one of a series of proposals being submitted relating to technical, editorial and organizational changes proposed for the Administrative chapters (Chapter 1) in all of the I-Codes.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) and . ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/.

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021, the PMGCAC has held several virtual meetings open to any interested party. 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 is an editorial change that provides consistency between I-codes.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee stated that the reason for the approval was that the permit valuation needs to be in the hands of the building, code or fire code official and this change clarifies it by making it consistent across the other codes in a plain language correction. (Vote: 12-1)

Final Hearing Results

ADM43-22 Part I AS

ADM44-22

Original Proposal

IFGC: SECTION 110, 110.3, SECTION 115, [A] 115.6.2; IMC: SECTION 112, [A] 112.3, SECTION 115, [A] 115.6.2; IPC: SECTION 112, [A] 112.3, SECTION 115, [A] 115.6.2; IPSDC: SECTION 110, [A] 110.3, SECTION 114, [A] 114.6.2; ISPSC: SECTION 109, [A] 109.3, SECTION 113, [A] 113.6.2

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org)

2021 International Mechanical Code

SECTION 112
SERVICE UTILITIES

[A] 112.3 Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without the approval required by Section 112.1 or 112.2. The code official shall notify the serving utility, and wherever possible the owner or the owner's authorized agent and occupant of the building, structure or service system, of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner, the owner's authorized agent or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

SECTION 115
VIOLATIONS

Revise as follows:

[A] 115.6.2 Authority to order ~~disconnection of energy sources~~ disconnect service utilities. The code official shall have the authority to ~~order~~ authorize disconnection of utility services in accordance with Section 112.3~~energy sources supplied to a building, structure or mechanical system regulated by this code, where it is determined that the mechanical system or any portion thereof has become hazardous or unsafe. Written notice of such order to disconnect service and the causes therefor shall be given within 24 hours to the owner, the owner's authorized agent and occupant of such building, structure or premises, provided, however, that in cases of immediate danger to life or property, such disconnection shall be made immediately without such notice. Where energy sources are provided by a public utility, the code official shall immediately notify the serving utility in writing of the issuance of such order to disconnect~~.

Reason: ADM 39-19 was a coordinating proposal for Service Utilities. There was an inadvertent duplication of language in the section on Violations. This proposal is intended to editorially remove the repeated sections. A reference to the same section in Service Utilities is provided instead.

This proposal is submitted by the Plumbing/Mechanical/Gas Code Action Committee (PMGCAC) working with the Building Code Action Committee (BCAC).

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021, the PMGCAC has held several virtual meetings open to any interested party. 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

These are administration requirements, so there will be no change in construction requirements.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee stated that the reason for approval was that it provides good clarification to the code. (Vote: 13-0)

Final Hearing Results

ADM44-22	AS

ADM48-22 Part I

Original Proposal

IBC: SECTION 113, [A] 113.1, [A] 113.2, [A] 113.3, [A] 113.4; IEBC: SECTION 112, [A] 112.1, [A] 112.2, [A] 112.3, [A] 112.4; IFC: SECTION 111, [A] 111.1, [A] 111.2, [A] 111.3, [A] 111.4; IFGC: SECTION 113, 113.1, [A] 113.2, 113.3, 113.4; IMC: SECTION 114, [A] 114.1, [A] 114.2, [A] 114.3, [A] 114.4; IPC: SECTION 114, [A] 114.1, [A] 114.2, [A] 114.3, [A] 114.4; IPMC: SECTION 107, 107.1, [A] 107.2 , 107.3, 107.4; IPSDC: SECTION 112, [A] 112.1, 112.2, [A] 112.3, [A] 112.4; ISPSC: SECTION 111, [A] 111.1, [A] 111.2, [A] 111.3, [A] 111.4; IWUIC: SECTION 113, [A] 113.1, [A] 113.2, [A] 113.3, [A] 113.4; IGCC: SECTION 111, 111.1, 111.2, 111.3, 111.4

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org); Joseph J. Summers, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org); Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2021 International Mechanical Code

SECTION 114
MEANS OF APPEALS

[A] 114.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official.

Revise as follows:

[A] 114.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have the authority to waive requirements of this code ~~or interpret the administration of this code~~.

[A] 114.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training<u>on matters pertaining to the provisions of this code</u> and are not employees of the jurisdiction.

[A] 114.4 Administration. The code official shall take i~~mmediate~~ action in accordance with the decision of the board.

Reason: ADM40-19 was approved for IBC, IEBC, IFC, IWUIC, IPC, IMC, IFGC, ISPSC, IPMC, IPSDC, IECC-R and IGCC for revisions to the section on Means of Appeals. This item was disapproved for IECC Commercial and IRC. The result is an inconsistency with IECC Commercial and IRC.

The intent of this proposal is coordination for the means of appeals within the family of codes. Most of this was accomplished through ADM40-19 during the last cycle. Comments during the testimony, from the code development committees and subsequent discussions have suggested some improvements.

General: In the IRC and IECC Residential, the sentence about the code official not being a voting member of the board of appeals is proposed to be deleted. The fact about city employees not being a voting member of the board is already included in the section on qualifications. The code official is an important advisor for the Board of Appeals. The deletion of this sentence will not change that.

Limitation on authority. The deletion of 'or interpret the administration of this code' is proposed to be deleted so that the board could consider appeals on any part of the codes.

Qualifications: The phrase for experience and training is slightly different in each code. Adding this idea to all codes would provide

consistency.

Administration: The IRC code change committee felt that 'immediate' was unreasonable. With the word removed, the board, or jurisdiction can set a reasonable timeframe.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (FCAC) and . ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/fire-code-action-committee-fcac/

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021, the PMGCAC has held several virtual meetings open to any interested party. 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
These are administration requirements, so there will be no change in construction requirements.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee stated that the reason for approval was the proponent's reason statement which includes coordination of the codes. It was specifically noted that most jurisdictions have a single board of appeals that covers all the codes in that jurisdiction, so it is important to only have one set of requirements that is consistent within each code. (Vote: 13-0)

Public Comments

Public Comment 1

Proponents: Robert Frances, Howard County (MD) Dept. of Inspections, Licenses, & Permits, Self (bfrances@howardcountymd.gov) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 113.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training on matters pertaining to <u>the</u> provisions of this code and are not employees of the jurisdiction.

2021 International Existing Building Code

[A] 112.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training~~to pass~~ on matters

pertaining to the provisions of this code and are not employees of the jurisdiction.

Commenter's Reason: These are two minor editorial corrections to add the word "the" to Section 113.3 of the IBC, and striking out the words "to pass" from Section 112.3 of the IEBC.

Cost Impact: The net effect of the Public Comment and code change proposal will not increase or decrease the cost of construction This will have no cost impact on what has already been passed; it is editorial in nature only.

Public Comment 2

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org) requests As Modified by Public Comment

Modify as follows:

2021 International Building Code

[A] 113.4 Administration . The *building official* shall take action without delay in accordance with the decision of the board.

2021 International Existing Building Code

[A] 112.4 Administration. The *code official* shall take actionwithout delay in accordance with the decision of the board.

2021 International Fire Code

[A] 111.4 Administration. The *fire code official* shall take actionwithout delay in accordance with the decision of the board.

2021 International Fuel Gas Code

113.4 Administration. The *code official* shall take actionwithout delay in accordance with the decision of the board.

2021 International Mechanical Code

[A] 114.4 Administration. The code official shall take action without delay in accordance with the decision of the board.

2021 International Plumbing Code

[A] 114.4 Administration. The code official shall take action without delay in accordance with the decision of the board.

2021 International Property Maintenance Code

107.4 Administration. The *code official* shall take actionwithout delay in accordance with the decision of the board.

2021 International Private Sewage Disposal Code

[A] 112.4 Administration. The *code official* shall take actionwithout delay in accordance with the decision of the board.

2021 International Swimming Pool and Spa Code

[A] 111.4 Administration. The *code official* shall take actionwithout delay in accordance with the decision of the board.

2021 International Wildland-Urban Interface Code

[A] 113.4 Administration. The *code official* shall take action without delay in accordance with the decision of the board.

2021 International Green Construction Code

111.4 Administration. The authority having jurisdiction shall take action without delay in accordance with the decision of the board.

Commenter's Reason: Last cycle the Administrative Committee asked the BCAC to remove the word 'immediate' as it could be read to require the code official to respond immediately after the board made it's decision - as in that night immediately following the conclusion of the meeting. This proposal did that. However, after the spring hearings, BCAC received comments that no timeline could be read the opposite - in that a code official could delay indefinately. It is hope that 'without delay' is a reasonable compromise.

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 correction with no changes to construction requirements.

Final Hearing Results

ADM48-22 Part I AMPC1,2

F54-21 Part II

Original Proposal

IMC: 1101.1, 1101.1.1, 1101.1.2

Proponents: Jeffrey Shapiro, International Code Consultants, IIAR (jeff.shapiro@intlcodeconsultants.com)

2021 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. Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

1101.1.1 Refrigerants other than ammonia. Refrigeration systems using ~~Refrigerant piping design and installation for systems containing~~ a refrigerant other than ammonia~~, including pressure vessels and pressure relief devices~~, shall comply with this chapter, ~~and~~ ASHRAE 15, and the *International Fire Code*.

1101.1.2 Ammonia refrigerant. Refrigeration systems using ammonia ~~as the~~ refrigerant shall comply with IIAR 2 for system design, IIAR 3 for valves, IIAR 4 for installation, and IIAR 5 for start-up, and shall not be required to comply with this chapter.

Reason: This proposal was developed and approved by FCAC, as the proponent, but just before the submittal deadline, it was identified that staff could not find a record of PMGCAC also supporting it, which would be required for the proposal to go forward as a CAC proposal because it touches on the IMC. Rather than have this go unsubmitted, I agreed to sponsor the proposal and submitted it.
The scoping for provisions regulating refrigeration systems in the IFC and IMC are not correlated. This proposal accomplishes correlation and provides proper references to ASHRAE and IIAR standards. It also modifies the IMC by adding a needed reference to the IFC for refrigerants other than ammonia. The IFC includes regulations for such refrigerants that are not duplicated in the IMC. A companion change has been submitted to the IFC that will remove ammonia-specific regulations covered by reference standards. The IMC removed ammonia-specific requirements last cycle in deference to ANSI standards published by IIAR, which is the approach now used by all model codes, pending the correlating change to the IFC. Ammonia refrigeration systems are comprehensively regulated by IIAR standards, and the latest version of IIAR 2 serves as both a code and a standard, incorporating content that was previously handled by model fire and mechanical codes.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is not related to construction and has no impact on construction costs.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal has passed as submitted because it clarifies mechanical refrigeration systems, other than ammonia, shall be in accordance with ASHRAE 15. (Vote: 11-0)

Final Hearing Results

FG7-21 Part II

Original Proposal

IMC: 907.1, UL Chapter 15 (New)

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

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFGC COMMITTEE. PART II WILL BE HEARD BY THE IMC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2021 International Mechanical Code

Revise as follows:

907.1 General. Factory built cremation furnaces and commercial direct-fed incinerators shall be listed and labeled in accordance with UL 2790. Factory-built incinerators for domestic applications shall be listed and labeled in accordance with UL 791.Incinerators and ~~crematories~~ cremation furnaces shall be ~~listed and labeled in accordance with UL 791 and shall be~~installed in accordance with the manufacturer's instructions.

Add new standard(s) as follows:

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

2790-2010 Commercial Incinerators - with revisions through June, 2019

Reason: The types of equipment covered by this section are incinerators and cremation furnaces. Cremation furnaces are used in crematories. These types of equipment are factory-built and can be installed as a packaged unit or assembled in the field from factory built subassemblies.
This proposal identifies the correct standards used for listing these types of equipment.

UL 2790 covers factory-built cremation furnaces and commercial direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in a crematory.

UL 791 covers direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in one-and two-family dwellings for the burning of ordinary combustible waste materials and garbage incidental to domestic occupancy and having a firebox or charging compartment of not over 5 cubic feet capacity. Incinerators of this type may also be employed in other occupancies including commercial establishments and institutions where the refuse is of a character for which the incinerator is designed and is not excessive in amount.

Currently there are seven manufacturers with listed incinerators and cremation furnaces.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Since these standards are currently in use in the industry the cost will not increase.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal has passed as submitted because the proponent submitted correct UL standard references for devices. **UL 2790** covers factory-built cremation furnaces and commercial direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in a crematory.

UL 791 covers direct-fed incinerators, including those of the gas and electric ignition types, designed primarily for use in one-and two-family dwellings for the burning of ordinary combustible waste materials and garbage incidental to domestic occupancy and having a firebox or charging compartment of not over 5 cubic feet capacity. Incinerators of this type may also be employed in other occupancies including commercial establishments and institutions where the refuse is of a character for which the incinerator is designed and is not excessive in amount. (Vote: 10-1)

Final Hearing Results

FG7-21 Part II AS

FS47-21 Part III

Original Proposal

IMC: SECTION 202 (New), 504.2

Proponents: Andrew Bevis, National Fire Sprinkler Association, National Fire Sprinkler Association (bevis.andrew1988@gmail.com); Jeffrey Hugo, National Fire Sprinkler Association, NFSA (hugo@nfsa.org)

2021 International Mechanical Code

Add new definition as follows:

DRAFTSTOP

.

A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

Revise as follows:

504.2 Exhaust penetrations. Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, *approved* fire caulking or a noncombustible dryer exhaust duct wall receptacle. Ducts that exhaust clothes dryers shall not penetrate or be located within any fireblocking, ~~draftstopping~~ *draftstops* or any wall, floor/ceiling or other assembly required by the *International Building Code* to be fire-resistance rated, unless such duct is constructed of galvanized steel or aluminum of the thickness specified in Section 603.4 and the fire-resistance rating is maintained in accordance with the *International Building Code* . Fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow shall be prohibited in clothes dryer exhaust ducts.

Reason: This is an editorial change. The word draftstopping is used multiple times throughout the IBC, IFC, IMC and IPC. This term is used with no definition. However, the term draftstop is a defined term in the IBC and IFC. These are the same terms. This development replaces all occurrences of draftstopping with the defined term of draftstop. Additionally, this development inserts the definition for draftstop into the IMC and IPC.

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

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The committee all agree that the term "draftstop" is a more appropriate term than "draftstopping".The word draftstopping is used multiple times throughout the IBC, IFC, IMC and IPC. This term is used with no definition. However, the term draftstop is a defined term in the IBC and IFC. These are the same terms. This proposal replaces all occurrences of draftstopping with the defined term of draftstop. Additionally, this proposal inserts the definition for draftstop into the IMC and IPC. (Vote: 11-0)

Final Hearing Results

G1-21 Part V

Original Proposal

PART V - IMC: 306.1, 506.3.2.2; IFGC: [M]306.1; ICCPC: SECTION 202 (New)

Proponents: Mike Nugent, Chair, ICC Building Code Action Committee, ICC Building Code Action Committee (bcac@iccsafe.org); Michael O'Brian, Chair, FCAC (fcac@iccsafe.org); Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

306.1 Access. *Appliances*, controls devices, heat exchangers and HVAC system components that utilize energy shall ~~be accessible~~ provide access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.

506.3.2.2 Duct-to-hood joints. Duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, ~~accessible~~ available for inspection, and without grease traps.

Exceptions: This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:
   1.1. The hood duct opening shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees (1.57 rad) from the plane of the opening.
   1.2. The duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the duct not less than 1 inch (25 mm) above the bottom end of the duct.
   1.3. A gasket rated for use at not less than 1,500ºF (816ºC) is installed between the duct flange and the top of the hood.
   1.4. The duct-to-hood joint shall be secured by stud bolts not less than $^1/_4$ inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. The bolts and nuts shall be secured with lockwashers.
2. *Listed* and *labeled* duct-to-hood collar connections installed in accordance with Section 304.1.

Reason: This effort was started by the CACs in 2015/16 code change cycle, and continued in 2018/19. This proposal is to provide coordination with the action taken with -P84-15, M2-15, RB2-16, F12-16, CE137-16 Part 1, CE29-19 Part 1 and 2 . Because the term 'accessible' is most commonly understood as requiring access for persons with disabilities we are making the changes to delete the word accessible from the remaining codes and replace it with other words, defined terms or phrases that are not attributed to requiring access for the physically disabled. Many of the codes use the defined term 'access (to)' or 'ready access (to)' for access by maintenance and service personnel or fire departments. This proposal provides clarity and consistency in the remaining codes where those coordination modifications missed or came in as part of new code changes.

Code change proposal M2-15 removed 'door' from the definitions for 'access (to)' and 'ready access (to)'. That coordination item did not happen across codes and this proposal seeks to complete that effort.

Similar proposals will be submitted for the Group B cycle for IRC, IECC and IEBC.

This proposal is submitted by the ICC Building Code Action Committee (BCAC), ICC Fire Code Action Committee (BCAC), and ICC Plumbing/Mechanical/Gas Code Action Committee (PMGCAC).
BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC.

The PMG CAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: PMGCAC.

The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire and life safety in new and existing buildings and facilities as well as the protection of life and property in wildland urban interface areas. In 2020 and 2021 the Fire-CAC held multiple virtual meetings that were open to any interested party. In addition, there were numerous virtual specific working group meetings that were also open to any interested parties, to develop, discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
There is no change to any of the requirements. This is only a clarification in terminology.

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: The proposal was approved as submitted because it provides coordination with the action taken with -P84-15, M2-15, RB2-16, F12-16, CE137-16 Part 1, CE29-19 Part 1 and 2 . Because the term ‘accessible’ is most commonly understood as requiring access for persons with disabilities, the proposal deletes the word accessible from the code and replaces it with other words, defined terms or phrases that are not attributed to requiring access for the physically disabled. This proposal provides clarity and consistency in the remaining codes where those coordination modifications missed or came in as part of new code changes. (Vote: 11-0)

Final Hearing Results

G1-21 Part V AS

G3-21 Part IV

Original Proposal

PART IV - IMC: SECTION 202(New)

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

2021 International Mechanical Code

Add new definition as follows:

[BG] AMBULATORY CARE FACILITY

.

Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

Reason: The term “ambulatory care facility” is currently defined in the IBC and IFC. It should be defined in the other codes where the term is used. When this item was first introduced to the codes, it was believed that it was needed to add ‘Group B’ in front of the term. This proposal removes it as no longer necessary, and will make this consistent with the numerous other locations throughout the codes where ‘Group B’ in not included. The intent is to not appear to have two different types of ‘ambulatory care facilities’.
There will also be a Group B proposal to IEBC to add the definition and correct the terms in 302.2.1, 503.15 and 805.11.

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 2020 the CHC held several virtual meeting, 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 CHC.

.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This an editorial clarification for consistent terminology

Public Hearing Results

Committee Action **As Submitted**

Committee Reason: This proposal passed as submitted because it correlates with other i-codes. The term “ambulatory care facility” is currently defined in the IBC and IFC. It should be defined in the other codes where the term is used. When this item was first introduced to the codes, it was believed that it was needed to add ‘Group B’ in front of the term. This proposal removes it as no longer necessary, and will make this consistent with the numerous other locations throughout the codes where ‘Group B’ in not included. The intent is to not appear to have two different types of ‘ambulatory care facilities’. (Vote: 11-0)

Final Hearing Results

P6-21 Part III

Original Proposal

IMC: 305.5.1 (New), 305.5, 504.8, 504.8.1 (New), 1109.3.1, 1109.3.1.1 (New)

Proponents: Joeseph J. Summers, Chair of the PMGCAC, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

2021 International Mechanical Code

Add new text as follows:

305.5.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

Revise as follows:

305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than ~~1 1/2 inches (38 mm)~~ 1 1/4 inches (32 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage)~~ shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.

504.8 Protection ~~required~~ against physical damage. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than $1^1/_4$ inches (32 mm) between the duct and the finished face of the framing member. Protective shield plates shall~~be constructed of steel, have a thickness of 0.062 inch (1.6 mm) and~~ extend not less than 2 inches (51 mm) above sole plates and below top plates.

Add new text as follows:

504.8.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

Revise as follows:

1109.3.1 ~~Pipe protection~~ Protection against physical damage,. In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group 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)~~ 1 1/4 inches (32 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates h~~aving a minimum thickness of 0.0575 inch (1.46 mm) (No. 16 gage)~~ shall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.

Add new text as follows:

1109.3.1.1 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

Reason: The safest place to install piping is in the middle of the wall. But in a typical 3-1/2 inch stud wall, even a 1/2-inch pipe (5/8-inch OD) ends up slightly nearer than the requisite 1-1/2 inch setback from either edge. Depending on enforcement, installers are often required to put shield plates on both sides of the stud. This makes no sense. By simply reducing the setback from 1-1/2 inches to 1-1/4 inches, both 1/2-inch and 3/4-inch piping can be safely installed in the center of the wall without triggering the need for shield plates on both sides. This encourages quality workmanship instead of penalizing it. The pipes are still safely out of range of drywall screws up to 1-1/2 inches long. This proposal is consistent with the National Electrical Code, which specifies a 1-1/4 inch setback from the edge of a stud. It is also

consistent with the IRC, which also specifies a 1-1/4 inch setback. Note that the Uniform Plumbing Code allows a 1-inch distance before a shield plate is required . This proposal will bring consistency to the I-Codes.

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 in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020, the PMG CAC has held several virtual meetings open to any interested party. Numerous interested parties attended the committee meetings and offered their input. Related documentation and reports are posted on the PMG CAC website at: https://www.iccsafe.org/products-and-services/i-codes/code-development-process/pmg-code-action-committee-pmgcac/ Reference PMGCAC Working Document Item 12.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Reducing the distance from the face of the stud for where shield plates are required could result in*fewer* plates needed for a project. The need for fewer plates would reduce cost of construction but that cost reduction would be insignificant.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:

1109.3.1 Protection against physical damage,.

In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group~~A2L~~ A2, A3, B2, and ~~B2L~~ B3 refrigerants and located in concealed locations where tubing is installed in studs, joists, rafters or similar member spaces, and located less than 1 1/4 inches (32 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates hshall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.

Committee Reason: The proposal has passed because the committee agreed that the proposal brought consistency between the IMC and the NEC, with respect to shield plate requirements. The modification brings in language that is consistent with other proposals dealing with revisions to refrigerant groups. (Vote: 10-0, 1 abstained)

Final Hearing Results

P6-21 Part III AM

S196-22

Original Proposal

IBC: 2211.3 (New); IPC: 307.2, 307.3 (New), [BS] C101.5, [BS] C101.6; IMC: [BS] 302.5, [BS] 302.5.2, [BS] 302.5.3; IFGC: [BS] 302.6, [BS] 302.7

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

[BS] 302.5 Cutting, notching and boring in cold-formed steel framing. The cutting, notching and boring of holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for non-structural members. The cutting, notching and boring of steel framing members shall comply with Sections 302.5.1 through 302.5.3.

Delete without substitution:

~~**[BS] 302.5.2 Cutting, notching and boring holes in cold-formed steel framing.** Flanges and lips of load-bearing cold-formed steel framing members shall not be cut or notched. Holes in webs of load-bearing cold-formed steel framing members shall be permitted along the centerline of the web of the framing member and shall not exceed the dimensional limitations, penetration spacing or minimum hole edge distance as prescribed by the *registered design professional*. Cutting, notching and boring holes of steel floor/roof decking shall be as prescribed by the *registered design professional*.~~

~~**[BS] 302.5.3 Cutting, notching and boring holes in non-structural cold-formed steel wall framing.** Flanges and lips of nonstructural cold-formed steel wall studs shall not be cut or notched. Holes in webs of nonstructural cold-formed steel wall studs shall be permitted along the centerline of the web of the framing member, shall not exceed $1^{1}/_{2}$ inches (38 mm) in width or 4 inches (102 mm) in length, and shall not be spaced less than 24 inches (610 mm) center to center from another hole or less than 10 inches (254 mm) from the bearing end.~~

Reason: This proposal sets uniform requirements for field modifications to cold-formed steel framing members (cutting, notching, and boring holes) in accordance with AISI standards.
Currently, the IFGC, IMC, and IPC all provide guidance on modification of cold-formed steel framing elements within the path of utilities. Although the guidance provided by each code is similar, they are not identical in wording or scope and are handled differently within each document.

Differences include but are not limited to:

- IFGC, IMC: The cutting and notching criteria is within the main body of the code.
- IFGC, IMC: Includes direction for wood, steel, cold-formed steel, and non-structural cold-formed steel materials.
- IPC: Points to the IBC for cutting and notching criteria but provides Appendix C as an alternate.
- IPC Appendix C:
    - Includes some, but not all, cutting and notching criteria and limitations found within the IFGC and IMC.
    - Does not address steel and cold-formed materials.

This will provide clear and consistent criteria across all trades on how to field modify framing members and when modification of such members requires input from a design professional.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International

Codes or portions thereof. In 2020 and 2021 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is a coordination of existing cutting, notching and boring provisions that are already used in practice but are not identical between codes or fully aligned with AISI standards.

Public Hearing Results

Committee Action **As Modified**

Committee Modification:
2021 International Building Code

2211.3 Cutting~~,~~ and notching~~, and boring~~. The cutting~~,~~ and notching ~~and boring~~ of holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for non-structural members.

2021 International Plumbing Code

307.3 Cutting~~,~~ and notching ~~and boring~~ in cold-formed steel framing. The cutting~~,~~ and notching ~~and boring~~ of holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for non-structural members.

2021 International Mechanical Code

[BS]302.5 Cutting~~,~~ and notching ~~and boring~~ in cold-formed steel framing. The cutting~~,~~ and notching ~~and boring of~~ holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for non-structural members. ~~The cutting, notching and boring of steel framing members shall comply with Sections 302.5.1 through 302.5.3.~~

2021 International Fuel Gas Code

[BS]302.6 Cutting~~,~~ and notching ~~and boring~~ in cold-formed steel framing. The cutting~~,~~ and notching ~~and boring~~ of holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for non-structural members.

Committee Reason: Approved as modified as the proposal coordinates the requirements across the I-Codes and adds the needed reference to ANSI S240. The modification correctly removes reference to boring for steel. (Vote: 13-0)

Final Hearing Results

S196-22 AM

S224-22

Original Proposal

IBC: SECTION 2308.3 (New), 2308.3.1 (New), 2308.3.2 (New), 2308.3.2.1 (New), 2308.3.3 (New), 2308.3.4 (New), 2308.3.5 (New), 2308.4.2.4, 2308.5.9, 2308.5.10, 2308.7.4; IPC: 307.2, 307.3 (New), [BS] C101.1, [BS] C101.2, [BS] C101.3; IMC: [BS] 302.3, [BS] 302.3.1, [BS] 302.3.2, [BS] 302.3.3; IFGC: [BS] 302.3, [BS] 302.3.2, [BS] 302.3.3, [BS] 302.3.4

Proponents: Mike Nugent, Chair, Building Code Action Committee (bcac@iccsafe.org)

2021 International Mechanical Code

Revise as follows:

[BS] 302.3 Cutting, notching and boring in wood framing. The cutting, notching and boring of wood framing members shall comply with Section~~s~~ 2308.3 of the *International Building Code*. ~~302.3.1 through 302.3.4~~.

Delete without substitution:

~~**[BS] 302.3.1 Joist notching.** Notches on the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third the depth of the joist. Notches in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span.~~

~~**[BS] 302.3.2 Stud cutting and notching.** In exterior walls and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.~~

~~**[BS] 302.3.3 Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall be not closer than $^{5}/_{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall be not located at the same section of stud as a cut or notch.~~

Reason: This proposal consolidates similar wood cutting, notching and boring criteria from the IFGC, IMC, IPC, and IBC into a single location in the IBC, and does not impose new requirements or restrict any practices currently allowed within the I-Codes. The proposed language draws from current language in the IPC, IMC, and IFGC and IBC provisions in the conventional light-framed section. The existing language was used to the greatest extent possible and relocated to minimize technical changes.
Within the IBC, existing wood framing notching, cutting and boring provisions have been relocated into a single new Section 2308.3. This reorganization into one location makes the IBC provisions easy to find and will provide clear and consistent criteria across all trades on how to field modify framing members and when modification of such members requires input from a design professional.

Structural framing members are frequently modified in the field by non-structural trades, to facilitate the installation of mechanical, electrical, plumbing, and other utilities. Especially in conventional light-framed wood construction, such modifications are rarely overseen by a design professional with knowledge of critical framing elements that should remain unmodified and the role they play within the structure.

It is unrealistic to expect field personnel to continually seek the guidance of a design professional for every framing member requiring modification. However, modifications of critical framing members have the potential to negatively impact the integrity of the structure and the utility systems that rely on that structure for support. The resulting structural deficiencies caused by field modifications to framing members may only be realized during significant high-wind, seismic, impact, or other loading events that, while within the normal structure design criteria, are outside every day operating conditions. At best, such deficiencies may be realized by local deformation of finish materials and at worst, by partial or full collapse of a structure.

Currently, the IFGC, IMC, IPC, and IBC all provide guidance on modification of structural framing elements within the path of utilities. Although the guidance provided by each code is similar, they are not identical in wording or scope and are handled differently within each

document.

Differences include but are not limited to:

- IFGC, IMC: The cutting and notching criteria is within the main body of the code.
- IFGC, IMC: Includes direction for wood, steel, cold-formed steel, and non-structural cold-formed steel materials.
- IPC: Points to the IBC for cutting and notching criteria but provides Appendix C as an alternate. · IPC Appendix C
  - Includes some, but not all, cutting and notching criteria and limitations found within the IFGC and IMC.
  - Does not address steel and cold-formed materials.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).

BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2020 and 2021 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/building-code-action-committee-bcac/.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal consolidates existing and slightly varied provisions from multiple locations into one location within the wood chapter of the International Building Code.

Public Hearing Results

Committee Action **Disapproved**

Committee Reason: Disapproved as the proposal needs additional work as it affects multiple codes which address different multiple trades and it is appropriate to leave the requirements in each code as is currently done. (Vote: 11-3)

Final Hearing Results

S224-22 AS