

# INTERNATIONAL MECHANICAL CODE

## M1-09/10, Part I 202 (New)

### Proposed Change as Submitted

**Proponent:** Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

#### PART I – IMC

**Add new definitions as follows:**

**CONTINUOUS OPERATION.** Automatically activated and operating 24 hours a day or whenever the space is occupied.

**INTERMITTENT OPERATION.** Manually activated.

**Reason:** Currently the IMC and the IRC has several sections that require continuous or intermittent operation but never provides the guidance for how either is to be achieved. This addition to the definition section clearly provides the guidance necessary to address these specific sections.

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

ICCFILENAME: TOMBERLIN-M-4-M-13-202-RB-3-R202

### Public Hearing Results

#### PART I - IMC

**Committee Action:**

**Disapproved**

**Committee Reason:** The operation status of something is not dependent upon the type of controls whether intermittent or continuous. The dictionary definition is adequate for these terms. Spaces such as battery rooms and machine rooms are not occupied yet the ventilation is continuous. A ventilation shaft roof fan runs 24/7 and is manually operated, but, it would fit under the definition of intermittent. A continuously operating fan could be manually activated.

**Assembly Action:**

**None**

### Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), ICC Region VII, requests Approval as Submitted.**

**Commenter's Reason:** Currently the IMC and the IRC have several sections that require continuous or intermittent operation but never provide the guidance for how either is to be achieved. This addition to the definition section clearly provides the guidance necessary to address these specific sections. The most prominent reason that both committees had for disapproval was that a manually operated switch could be used and be considered continuously operated. I disagree. Generally a manually operated switch is installed as a disconnecting means to service equipment. This switch is not designed to be used as a control mechanism for the equipment.

Final Action: AS AM AMPC\_\_\_ D

**M1-09/10, Part II  
202 (New)**

**Proposed Change as Submitted**

**Proponent:** Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

**PART II – IRC MECHANICAL**

**Add new definitions as follows:**

**CONTINUOUS OPERATION.** Automatically activated and operating 24 hours a day or whenever the space is occupied.

**INTERMITTENT OPERATION.** Manually activated.

**Reason:** Currently the IMC and the IRC has several sections that require continuous or intermittent operation but never provides the guidance for how either is to be achieved. This addition to the definition section clearly provides the guidance necessary to address these specific sections.

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

ICCFILENAME: TOMBERLIN-M-4-M-13-202-RB-3-R202

**Public Hearing Results**

**PART II - IRC**

**Committee Action:**

**Disapproved**

**Committee Reason:** Other ventilation proposals are not compatible with this proposal. Intermittent operation can be automatic and manual operation can be continuous. Need to bring back in a public comment to coordinate with other proposals.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), ICC Region VII, requests Approval as Submitted.**

**Commenter's Reason:** Currently the IMC and the IRC have several sections that require continuous or intermittent operation but never provide the guidance for how either is to be achieved. This addition to the definition section clearly provides the guidance necessary to address these specific sections. The most prominent reason that both committees had for disapproval was that a manually operated switch could be used and be considered continuously operated. I disagree. Generally a manually operated switch is installed as a disconnecting means to service equipment. This switch is not designed to be used as a control mechanism for the equipment.

Final Action: AS AM AMPC\_\_\_ D

# M11-09/10

## 306.5 (IFGC 306.5)

### Proposed Change as Submitted

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

**306.5 (IFGC 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 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) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders.

~~Where equipment requiring access and appliances are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances' level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope) 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.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of with standing 100 pounds per square foot (488.2 kg/m<sup>2</sup>). 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. Ladders shall be protected against corrosion by *approved* means.

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:** This is an effort to stream-line and simplify this section and exclude unnecessary language. This text eliminates where roofs are to be measured by prescribing that if the roof is greater than 16 feet, inside or outdoor access is required regardless of how high parapets are. Prohibiting the use of portable ladders assures that the ladders associated with access are close enough to the ground or floor to access. There is nothing new in this text.

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

ICCFILENAME: MCMANN-M-33-306.5

### Public Hearing Results

**Modify the proposal as follows:**

**306.5 (IFGC 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 above grade or floor level to access such equipment or appliances, an interior or exterior permanent means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders.

~~Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.~~

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.

4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of with standing 100 pounds per square foot (488.2 kg/m2). 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. Ladders shall be protected against corrosion by *approved* means.

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:** This is an effort to stream-line and simplify this section and exclude unnecessary language. This text eliminates where roofs are to be measured by prescribing that if the roof is greater than 16 feet, inside or outdoor access is required regardless of how high parapets are. Prohibiting the use of portable ladders assures that the ladders associated with access are close enough to the ground or floor to access. There is nothing new in this text.

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

ICCFILENAME: MCMANN-M-33-306.5

### **Public Hearing Results**

**Committee Action:**

**Approved as Modified**

**Committee Reason:** The proposed revision deletes unnecessary text and clarifies the intent which is to ban the use of portable ladders where a climb to the equipment/appliance is over 16 feet in height. The modification deletes the parapet text which is already addressed in the revised text; adds the adjective "permanent" to enforce to the intended ban on portable ladders and adds "or floor level" to address multi-story buildings.

**Assembly Action:**

**None**

### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Submitted.**

**Commenter's Reason:** The intent is if personnel must climb over 16 feet for any reason, which would include climbing a stairwell to an upper level, then a permanent ladder will need to be provided to an interior hatch even if it is 15 feet from the floor level. It is not safe or practical for fire or maintenance personal to haul long extension ladders up stairwells which may be many stories tall. The added term "permanent" is redundant with the last sentence which bans portable ladders. The stricken text related to parapets needs to be retained because the issue of roof height verses parapet height will be left unresolved without the text.

Final Action:                      AS                      AM                      AMPC\_\_\_\_\_                      D

## **M18-09/10**

### **401.4**

### **Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

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

1. Intake openings shall be located a minimum of 10 feet (3048 mm) from lot lines or buildings on the same lot.  
~~Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way.~~

2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, ~~parking lots~~ and loading docks. Where openings front on a street or public way, the distance shall be measured from the centerline 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.
4. Intake openings on structures in flood hazard areas shall be at or above the design flood level.

**Reason:** The second sentence seems to be misplaced as the dialogue concerning streets and alleys is in item # 2. Another problem here is that most streets are 20 feet wide. Measuring from the center places an opening directly on the side of the street which defeats the purpose. The contaminant sources listed make sense due to constant vehicle movement and idling but parking lots don't fit. Parking lots generally have vehicles that are not running and are open on all sides preventing an accumulating emission problem. An occasional vehicle entering or leaving a lot should not present a significant concern.

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

ICCFILENAME: MCMANN-M-35-401.4

### **Public Hearing Results**

**Committee Action:** **Disapproved**

**Committee Reason:** Parking lots should not be deleted because of the contaminants present in such locations. The current text is more clear.

**Assembly Action:** **None**

### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*

**Judson Collins, JULYCO, representing self, requests Approval as Submitted.**

**Commenter's Reason:** The proponent has offered a logical modification to the section. If a measurement is taken from the middle of the street on a 4-lane street, the intake could be over the street or at least at the very edge of the street. Measuring from the edge of the public way or street seems to be more in line with the intent of this section to minimize the chance of contaminants entering the intake.

*Public Comment 2:*

**Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

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

1. Intake openings shall be located a minimum of 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. 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.
4. Intake openings on structures in flood hazard areas shall be at or above the design flood level.

**Commenter's Reason:** There were concerns that parking lots should not have been removed. Most streets are 20 feet wide or more and measuring from the center could permit openings dangerously close to contaminants.

Final Action:            AS                    AM                    AMPC \_\_\_\_            D

**M24-09/10**  
**Table 403.3**

**Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise table as follows:**

**TABLE 403.3**  
**MINIMUM VENTILATION RATES**

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE RP CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE RA CFM/FT2 <sup>A</sup>	DEFAULT OCCUPANT DENSITY #/1000 FT2 <sup>A</sup>	EXHAUST AIRFLOW RATE CFM/FT2 <sup>A</sup>
Beauty and nail salons <sup>B,h</sup> Nail salon stations <sup>h</sup>	20 -	0.12 -	25 -	0.6 <u>50 per station<sup>h</sup></u>

h. For Nail Salons, ~~the required exhaust shall include ventilation tables or other systems that capture the contaminants and odors at their source and are capable of exhausting a minimum of 50 cfm per station~~ each nail station shall be provided with a source capture system capable of exhausting not less than 50 cfm per station.

*(Portions of table and notes not shown remain unchanged)*

**Reason:** Beauty and nail salons should not be combined and treated the same way as it relates to exhaust. Beauty salons in general do not use the same chemicals as found in nail stations. When a properly installed source capture system is employed, as defined in this code, recirculation of air should not be an issue. Source capture systems may take many forms and include ventilation tables and small hood arrangements that are intended to capture the contaminants at their source. This is why some of the language in the footnote has been removed because source capture systems include all these. The definition also states that the exhaust must be discharged to the outdoors. The general area of a nail salon should not be prohibited from recirculation because the source capture system has solved the concerns involving contamination associated with the use of acetone and other chemicals. The exhaust requirements in the table take care of the mild odors commonly found in these occupancies.

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

ICCFILENAME: MCMANN-M-24-T. 403.3

**Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** Note b should remain. The exhaust rate of 50 cfm per station is in addition to the exhaust rate of 0.6 cfm per sq. ft required for beauty and nail salons.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*

**Judson Collins, JULYCO, representing self, requests Approval as Submitted.**

**Commenter's Reason:** The proposal does not change the current requirements in the code. It just clarifies that each nail salon station is required to have a source capture system with a minimum exhaust rate of 50 cfm as currently required in footnote h.

Final Action: AS AM AMPC\_\_\_\_\_ D

Public Comment 2:

Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

TABLE 403.3  
MINIMUM VENTILATION RATES

Occupancy Classification	People Outdoor Airflow Rate in Breathing Zone Rp cfm/person	Area Outdoor Airflow Rate in Breathing Zone Ra Cfm/ft2 (a)	Default Occupant Density #/1000 ft2 (a)	Exhaust Airflow Rate Cfm/ft2 (a)
Beauty and nail salons <sup>b</sup>	20	0.12	25	0.6
Nail salons <sup>b,h</sup>	<u>20</u>	<u>0.12</u>	<u>25</u>	<del>50 per station</del> <sup>h</sup> <u>0.6</u>

h. For Nail Salons, each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station.

**Commenter's Reason:** The committee said that footnote "b" should remain with beauty salons and they were correct, so, it has been restored. Generally, beauty and nail salons were separated into two categories for ease of understanding that footnote h would not apply to beauty salons that do not do nails. No new requirements are in this proposal. It is obvious that the current code requires a general exhaust system for nail salons in addition to the required source capture system and, so, the ventilation specifications have been inserted in the newly separated row for nail salons.

Final Action: AS AM AMPC\_\_\_\_\_ D

**M31-09/10, Part I**  
**501.5 (New)**

**Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**PART I – IMC**

**Add new text as follows:**

**501.5 Domestic exhaust fan manifolding prohibited.** Domestic-type environmental air exhaust fans shall not be interconnected to a common discharge duct. Such fans shall be independently exhausted to the outdoors.

**Reason:** The code does not address the manifolding of residential type exhaust fans. This practice produces poor results for venting. Air, like water, will seek the path of least resistance and the back-draft dampers are not intended to be air tight. Once the duct is pressurized, air still makes it way back into the building. The practice of combining fans and enlarging ducts produces velocity issues as the manufacturers will agree with, resulting in poor performance which is just one of the reasons this type of arrangement is not printed in any of the instructions. Conversations with engineers at Braun/Nu Tone agree, the best performance is achieved when these fans are exhausted independently. Rarely when combined is it done correctly, which would require extra back-draft dampers at wye locations and the calculations required to properly size ducts and determine maximum lengths. The practice of throwing two, three or more fans together defeats the purpose from an effective ventilation standpoint. The excuse that multiple penetrations in the building are undesirable cannot be the reason for this practice. If a single penetration is desired for multiple bathrooms, then a central exhaust system properly designed for the load is the way to achieve it.



As we can see in this poor example, the code does not address this situation. There needs to be clear guidance in order to prevent this type of installation.

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

ICCFILENAME: MCMANN-M-31-501.5-RM-2-M1506.1

### **Public Hearing Results**

**PART I - IMC**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposal limits designer flexibility. The text could be misconstrued to prohibit common exhaust shaft arrangements with subducts. The term manifold is not defined.

**Assembly Action:**

**None**

### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Replace proposal as follows:**

**501.5 Multiple exhaust fan discharge interconnections prohibited.** The discharge ducts from exhaust fans shall not be interconnected except where such interconnections are in accordance with accepted engineering practice or are in accordance with the manufacturers' installation instructions.

**Commenter's Reason:** This fix addresses the concerns raised by the committee and some members on the floor. The committee didn't care for the word "manifolding" so it was replaced with the word "interconnected". The revised wording clarifies that it does not intend to prohibit a common fan with multiple intakes. The proposed text prevents interconnection of discharge ducts on the outlet side of the fans and does not prevent connection of a fan to multiple intake ducts. This change in general is attempting to address the abuses of installers tying together multiple fans with no thought behind it, and as a result, exhausted air makes its way back into the building through leaky back-draft dampers. Tying fans together also decreases the flow performance and efficiency of the fans. There is no guidance in the code that inspectors can use to prevent these poor installations.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D

## **M31-09/10, Part II**

### **IRC M1506.1 (New)**

### **Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)



**PART II – IRC MECHANICAL**

**Add new text as follows:**

**M1506.1 Exhaust fan manifolding prohibited.** Exhaust fans shall not be interconnected utilizing a common discharge duct. Exhaust fans shall be independently exhausted to the outdoors.

**Reason:** The code does not address the manifolding of residential type exhaust fans. This practice produces poor results for venting. Air, like water, will seek the path of least resistance and the back-draft dampers are not intended to be air tight. Once the duct is pressurized, air still makes it way back into the building. The practice of combining fans and enlarging ducts produces velocity issues as the manufacturers will agree with, resulting in poor performance which is just one of the reasons this type of arrangement is not printed in any of the instructions. Conversations with engineers at Braun/Nu Tone agree, the best performance is achieved when these fans are exhausted independently. Rarely when combined is it done correctly, which would require extra back-draft dampers at wye locations and the calculations required to properly size ducts and determine maximum lengths. The practice of throwing two, three or more fans together defeats the purpose from an effective ventilation standpoint. The excuse that multiple penetrations in the building are undesirable cannot be the reason for this practice. If a single penetration is desired for multiple bathrooms, then a central exhaust system properly designed for the load is the way to achieve it.



As we can see in this poor example, the code does not address this situation. There needs to be clear guidance in order to prevent this type of installation.

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

ICCFILENAME: MCMANN-M-31-501.5-RM-2-M1506.1

**Public Hearing Results**

**PART II - IRC**

**Committee Action:**

**Disapproved**

**Committee Reason:** Disapproval is consistent with action taken on Part I. Text should be revised by a public comment so as not to prohibit systems that use a common fan with multiple exhaust inlets.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Replace the proposal as follows:**

**M1506.1 Multiple exhaust fan discharge interconnections prohibited.** The discharge ducts from exhaust fans shall not be interconnected except where such interconnections are in accordance with accepted engineering practice or are in accordance with the manufacturers' installation instructions.

**Commenter's Reason:** This fix addresses the concerns raised by the committee and some members on the floor. The committee didn't care for the word "manifolding" so it was replaced with the word "interconnected". The revised wording clarifies that it does not intend to prohibit a common fan with multiple intakes. The proposed text prevents interconnection of discharge ducts on the outlet side of the fans and does not prevent connection

of a fan to multiple intake ducts. This change in general is attempting to address the abuses of installers tying together multiple fans with no thought behind it, and as a result, exhausted air makes its way back into the building through leaky back-draft dampers. Tying fans together also decreases the flow performance and efficiency of the fans. There is no guidance in the code that inspectors can use to prevent these poor installations.

Final Action: AS AM AMPC D

## M35-09/10, Part I

### 504.4, 504.6.2

**NOTE: PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART II IS REPRODUCED ONLY FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART I.**

### Proposed Change as Submitted

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

#### PART I – IMC

**Revise as follows:**

**504.4 Exhaust installation.** Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a back-draft damper. Screens shall not be installed at the duct termination. Ducts shall ~~not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow.~~ be mechanically fastened in accordance with *SMACNA Duct Construction Standard- Metal and Flexible*. Fasteners shall not protrude into the duct more than 1/8 inch. Ducts shall be sealed in accordance with Section 603.9. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or chimney. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

**504.6.2 Duct installation.** Exhaust ducts shall be supported at ~~4-12~~ 4-12 foot intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. ~~Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct.~~

**Reason:** ( PART I ) 504.4 and 504.6.2 conflict with the SMACNA Standard and contain conflicting or, at least, redundant text. Tape alone is no means of correctly fastening any duct. Code Officials may certainly permit this practice if they chose to do so but the code should not direct a practice that conflicts with the Standard it condones. There is nothing wrong with small fasteners as long as they don't extend too far into the duct. A maximum penetration of 1/8 inch will assure minimum lint buildup as much more than that collects on the duct walls. Duct cleaning firms are having difficulties because the ducts are coming apart, requiring them to open up finished walls to repair them, there by creating added expenses and unhappy customers. Duct separations in any location, especially in concealed locations, could result in a fire hazard and moisture and lint accumulation. Mechanically fastened ducts can tolerate a longer interval (12 feet) between supports and the current 4 feet interval is overkill.

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

ICCFILENAME: MCMANN-M-27-504.4-504.6.2-RM-6-M1502.4.1

### Public Hearing Results

#### PART I - IMC

**Committee Action:**

**Disapproved**

**Committee Reason:** Screws that protrude ¼ inch into ducts can create blockages and allowing 1/8 inch protrusions is not much safer.

**Assembly Action:**

**None**

### Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**504.4 Exhaust installation.** Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a back-draft damper. Screens shall not be installed at the duct termination. Ducts shall be mechanically fastened, ~~in accordance with SMACNA Duct Construction Standard – Metal and Flexible.~~ Fasteners shall not protrude into the duct more than 1/8 inch. Ducts shall be sealed in accordance with Section 603.9. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or chimney. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

**504.6.2 Duct installation.** Exhaust ducts shall be supported at intervals not to exceed 12 feet ~~foot intervals~~ and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of flow.

**Commenter's Reason:**

The committee had concerns about the reference to SMACNA so it was removed. The modification to 504.6.2 is consistent with the SMACNA standard.

Final Action: AS AM AMPC D

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**NOTE: PART II REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE**

**M35–09/10**

IRC M1502.4.1, M1502.4.2, M1502.4.4.1

**Revise as follows:**

**M1502.4.1 Material and size** Exhaust ducts shall have a smooth interior finish and be constructed of metal having a minimum thickness of ~~0.016 inch (0.4 mm)~~ 0.0157 inches (.3950 mm) (No. 28 gage). ~~thick.~~ The duct shall be 4 inches nominal in diameter.

**M1502.4.2 Duct installation.** Exhaust ducts shall be supported at ~~4-12~~ foot intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Exhaust duct joints shall be sealed in accordance with Section M1601.4.1 and shall be mechanically fastened. Ducts shall not be joined with screws or similar fasteners that protrude more than 1/8 inch (3.2 mm) into the inside of the duct.

**M1502.4.4.1 Specified length.** The maximum length of the exhaust duct shall be ~~25 feet (7620 mm)~~ 35 feet (1068 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1.

**Reason: (PART II)** The language in M1502.4.1 is consistent with language in last cycles M-16 Part II which was approved. M1502.4.2 violates the SMACNA Standard for hanger spacing and the last sentence also violates M1502.5 in that tape alone is not a means of connection for dryer vents. Duct cleaning firms are having fits because the ducts are coming apart requiring them to open up finished walls to repair them thereby creating added expense and unhappy customers. The 35-foot dimension is consistent with what is already in the IMC and IFGC.

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

**PART II – IRC**

**Modify the proposal as follows:**

**Revise as follows:**

**M1502.4.1 Material and size** Exhaust ducts shall have a smooth interior finish and be constructed of metal having a minimum thickness of 0.0157 inches (.3950 mm) (No. 28 gage). The duct shall be 4 inches nominal in diameter.

**M1502.4.2 Duct installation.** Exhaust ducts shall be supported at ~~4-12~~ foot intervals not to exceed 12 feet and shall be secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Exhaust duct joints shall be sealed in accordance with Section M1601.4.1 and shall be mechanically fastened. Ducts shall not be joined with screws or similar fasteners that protrude more than 1/8 inch (3.2 mm) into the inside of the duct.

**M1502.4.4.1 Specified length.** The maximum length of the exhaust duct shall be 35 feet (1068 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1.

**Committee Action:**

**Approved as Modified**

**Modify the proposal as follows:**

**Committee Reason:** Approval is based upon the proponent's printed reason. The modification clarifies that the 12 foot interval is a maximum interval.

**Assembly Action:**

**None**

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## M39-09/10, Part I

### 504.6.4, 504.6.4.3

#### Proposed Change as Submitted

**Proponent:** Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing the Home Ventilating Institute

#### **PART I – IMC**

##### **1. Revise as follows:**

**504.6.4 Duct length.** The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections 504.6.4.1 or through 504.6.4.2 504.6.4.3.

##### **2. Add new text as follows:**

**504.6.4.3 Dryer exhaust duct power ventilator.** The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled for use in dryer exhaust duct systems and shall be installed in accordance with the manufacturer's installation instructions.

**Reason:** During the rewrite of this section, dryer exhaust duct power ventilators were originally a part of the requirements. The section was deleted when the Supplemental requirements were not completed prior to the final code change hearing. This proposed text is similar to the original language proposed during the last cycle.

Dryer exhaust duct power ventilators are now regulated by Supplemental requirements to UL 705. These supplemental requirements specify testing for ventilators used in this application. The requirements include many safety provisions for the ventilators. The ventilator manufacturer specifies the maximum length of the dryer exhaust duct. This length is used for testing and listing the ventilator, thus verifying the instructions.

ICCFILENAME: BALLANCO-M-1-504.6.4-RM-1-M1502.4.4

#### Public Hearing Results

#### **PART I - IMC**

##### **Committee Action:**

**Disapproved**

**Committee Reason:** The UL standard for such units is not yet available. The proposed text lacks a requirement for a label stating that a power ventilator is part of the installed system. The proposed text would allow such units to be tested to any criteria or standard, thus allowing all units to be sold as dryer exhaust duct power ventilators without consistency in product safety.

##### **Assembly Action:**

**None**

#### Individual Consideration Agenda

**This item is on the agenda for individual consideration because public comments were submitted.**

##### *Public Comment 1:*

**Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing the Home Ventilating Institute, requests Approval as Modified by this Public Comment.**

##### **Modify proposal as follows:**

#### **PART I – IMC**

**504.6.4 Duct length.** The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections 504.6.4.1 through 504.6.4.3.

**504.6.4.3 Dryer exhaust duct power ventilator.** The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled for use in dryer exhaust duct systems as complying with Supplement SA of UL 705 and shall be installed in accordance with the manufacturer's installation instructions.

**Commenter's Reason:** At the first hearing, the Supplement to UL 705 was out to ballot. Furthermore, the Committee thought a direct reference to Supplement SA of UL 705 was appropriate. I have made the changes to reference the standard that regulates dryer exhaust duct power ventilators. Supplement SA of UL 705 complies with the ICC Policy for referenced standards.

**Analysis:** The standard, UL 705, was not reviewed or considered by the IMC Code Development committee and it was not considered by the hearing attendees at the time of the code development hearings. Section 3.6.3.1 of Council Policy #28, *Code Development*, requires that new standards be introduced in the original code change proposal, therefore, the introduction of a new standard via a public comment is not in accordance with the process required by CP# 28 for adding new standards to the code.

*Public Comment 2:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**504.6.4 Duct length.** The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections ~~504.6.4.1~~ ~~or~~ through 504.6.4.2 504.6.4.3.

**504.6.4.3 Dryer exhaust duct power ventilator.** The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled in accordance with UL 705 for use in dryer exhaust duct systems and shall be installed in accordance with the manufacturer's installation instructions.

**Commenter's Reason:** The committee was concerned that the standard was not yet ready. UL 705 is currently being balloted for this application. The results of the ballot should be available prior to the Final Action Hearing.

**Analysis:** The standard, UL 705, was not reviewed or considered by the IMC Code Development committee and it was not considered by the hearing attendees at the time of the code development hearings. Section 3.6.3.1 of Council Policy #28, *Code Development*, requires that new standards be introduced in the original code change proposal, therefore, the introduction of a new standard via a public comment is not in accordance with the process required by CP# 28 for adding new standards to the code.

Final Action:                    AS                    AM                    AMPC\_\_\_\_\_                    D

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**M39-09/10, Part II**  
**M1502.4.4, M1502.4.4.3**

**Proposed Change as Submitted**

**Proponent:** Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing the Home Ventilating Institute

**PART II – IRC MECHANICAL**

**1. Revise as follows:**

**M1502.4.4 Duct length.** The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections ~~M1502.4.4.1~~ ~~or~~ through M1502.4.4.2 M1502.4.4.3.

**2. Add new text as follows:**

**M1502.4.4.3 Dryer exhaust duct power ventilator.** The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled for use in dryer exhaust duct systems and shall be installed in accordance with the manufacturer's installation instructions.

**Reason:** During the rewrite of this section, dryer exhaust duct power ventilators were originally a part of the requirements. The section was deleted when the Supplemental requirements were not completed prior to the final code change hearing. This proposed text is similar to the original language proposed during the last cycle.

Dryer exhaust duct power ventilators are now regulated by Supplemental requirements to UL 705. These supplemental requirements specify testing for ventilators used in this application. The requirements include many safety provisions for the ventilators. The ventilator manufacturer specifies the maximum length of the dryer exhaust duct. This length is used for testing and listing the ventilator, thus verifying the instructions.

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

ICCFILENAME: BALLANCO-M-1-504.6.4-RM-1-M1502.4.4

## Public Hearing Results

### PART II - IRC

Committee Action:

Disapproved

Committee Reason: The proposed standard is not yet available.

Assembly Action:

None

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### Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

#### *Public Comment 1:*

**Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing the Home Ventilating Institute, requests Approval as Modified by this Public Comment.**

Modify proposal as follows:

#### **PART II – IRC MECHANICAL**

**M1502.4.4 Duct length.** The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections M1502.4.4.1 through M1502.4.4.3.

**M1502.4.4.3 Dryer exhaust duct power ventilator.** The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled ~~for use in dryer exhaust duct systems~~ as complying with Supplement SA of UL 705 and shall be installed in accordance with the manufacturer's installation instructions.

**Commenter's Reason:** At the first hearing, the Supplement to UL 705 was out to ballot. Furthermore, the Committee thought a direct reference to Supplement SA of UL 705 was appropriate. I have made the changes to reference the standard that regulates dryer exhaust duct power ventilators. Supplement SA of UL 705 complies with the ICC Policy for referenced standards.

**Analysis:** The standard, UL 705, was not reviewed or considered by the IRC Code Development committee and it was not considered by the hearing attendees at the time of the code development hearings. Section 3.6.3.1 of Council Policy #28, *Code Development*, requires that new standards be introduced in the original code change proposal, therefore, the introduction of a new standard via a public comment is not in accordance with the process required by CP# 28 for adding new standards to the code.

#### *Public Comment 2:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

Modify proposal as follows:

**M1502.4.4 Duct length.** The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections M1502.4.4.1 through M1502.4.4.3.

**M1502.4.4.3 Dryer exhaust duct power ventilator.** The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled in accordance with UL 705 for use in dryer exhaust duct systems and shall be installed in accordance with the manufacturer's installation instructions.

**Commenter's Reason:** The committee was concerned that the standard was not yet ready. UL 705 is currently being balloted for this application. The results of the ballot should be available prior to the Final Action Hearing.

**Analysis:** The standard, UL 705, was not reviewed or considered by the IRC Code Development committee and it was not considered by the hearing attendees at the time of the code development hearings. Section 3.6.3.1 of Council Policy #28, *Code Development*, requires that new standards be introduced in the original code change proposal, therefore, the introduction of a new standard via a public comment is not in accordance with the process required by CP# 28 for adding new standards to the code.

Final Action:            AS            AM            AMPC\_\_\_\_            D

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**M54-09/10**  
**506.3.9**

**Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Delete and substitute as follows:**

~~**506.3.9 Grease duct horizontal cleanouts.** Cleanouts located on horizontal sections of ducts shall be spaced not more than 20 feet (6096 mm) apart. The cleanouts shall be located on the side of the duct with the opening not less than 1.5 inches (38 mm) above the bottom of the duct, and not less than 1 inch (25 mm) below the top of the duct. The opening minimum dimensions shall be 12 inches (305 mm) on each side. Where the dimensions of the side of the duct prohibit the cleanout installation prescribed herein, the openings shall be on the top of the duct or the bottom of the duct. Where located on the top of the duct, the opening edges shall be a minimum of 1 inch (25 mm) from the edges of the duct. Where located in the bottom of the duct, cleanout openings shall be designed to provide internal damming around the opening, shall be provided with gasketing to preclude grease leakage, shall provide for drainage of grease down the duct around the dam, and shall be approved for the application. Where the dimensions of the sides, top or bottom of the duct preclude the installation of the prescribed minimum size cleanout opening, the cleanout shall be located on the duct face that affords the largest opening dimension and shall be installed with the opening edges at the prescribed distances from the duct edges as previously set forth in this section.~~

Cleanouts serving horizontal sections of grease duct shall:

1. Be spaced not more than 20 feet apart.
2. Be located not more than 10 feet from changes in direction.
3. Be located on the bottom only where no other locations are 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 from the edges of the duct.
5. Have opening dimensions of not less than 12 inches by 12 inches. Where such dimensions preclude installation, the opening shall be not less than 12 inches on one side and shall be large enough to provide access for cleaning and maintenance.
6. Shall be located at grease reservoirs.

**Reason:** This is a novel of a section, packed with information and in need of updating. Item # 2 is somewhat new though already implied. There is nothing prohibiting only one cleanout installed in the middle of a 24 foot section of duct as the code is silent on minimum numbers. This text would require that two cleanouts be provided. In item # 5, although the National Standard calls for 1 1/2 inches, it is an arbitrary number. This 1 inch dimension will have no effect structurally on the door installation nor will it have an effect on the duct itself and as a result, will provide a little more flexibility. Item # 6 already provides for a minimum 12 X 12 door but some flexibility is required for smaller duct sizes, but in no case should one side be less than 12 inches. Item # 7 is new. This establishes that a cleanout needs to be installed at grease reservoir locations in order to properly inspect and maintain the reservoir.

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

ICCFILENAME: MCMANN-M-17-506.3.9

**Public Hearing Results**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** The revised list version is easier to read than the original paragraph.

**Assembly Action:**

**None**

## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

### *Public Comment:*

**Shawn Strausbaugh, Arlington County, Virginia, representing VA Plumbing and Mechanical Inspectors Association, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

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

1. Be spaced not more than 20 feet apart.
2. Be located not more than 10 feet from changes in direction that are greater than 45 degrees.
3. Be located on the bottom only where no other locations are 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 from the edges of the duct.
5. Have opening dimensions of not less than 12 inches by 12 inches. Where such dimensions preclude installation, the opening shall be not less than 12 inches on one side and shall be large enough to provide access for cleaning and maintenance.
6. Shall be located at grease reservoirs.

**Commenter's Reason:** The only change is the language of #2 which previously did not state a specific degree of the change of direction meaning any slight change of direction would be required to be located not more than 10 feet from a cleanout. The added language specifies that a cleanout be located within 10 feet from changes in direction that are greater than 45 degrees.

Final Action:                      AS                      AM                      AMPC\_\_\_\_                      D

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## **M57-09/10**

### **506.3.10.2**

## **Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

**506.3.10.2 Field applied enclosure.** Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by field-applied grease duct enclosure that is a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire-stop system classified in accordance with ASTM E814 or UL 1497 and having a "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions. Partial application of a field-applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearance to combustibles at isolated sections of grease duct except where specifically listed and labeled for such partial application. Exposed duct-wrap systems shall be protected where subject to physical damage.

**Reason:** The true intent of duct wrap systems is that they be applied to an *entire* system, not just a portion of one. This comes into play when Section 506.3.10.4 is employed. This section usually works up to the point where the roof must be penetrated. Most of these structures are wood construction or there is combustible material on decking and so forth, that the duct must get by. A practice has been to only wrap the duct from a point 18 inches from the bottom of the roof deck up through the curb. If this material was intended to be used this way, it would be found in Table 308.6. This material must meet all 5 tests of ASTM E 2336 which includes the internal fire test and the external full engulfment test. The material would never pass the test under partial application and has never been tested in this fashion, that is, to reduce clearances in small sections of duct. The manufacturers will be the first to explain that their product is not approved for this application. The code does not specifically address this poor practice. The intent of the exception is for the duct to be able to exit the structure on its own ability and to not come within 18 inches of combustible construction.

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

ICCFILENAME: MCMANN-M-28-506.3.10.2



## Public Hearing Results

**Modify the proposal as follows:**

**Revise as follows:**

**506.3.10.2 Field applied enclosure.** Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by field-applied grease duct enclosure that is a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire-stop system classified in accordance with ASTM E814 or UL 1497 and having a "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions. Partial application of a field-applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearance to combustibles at isolated sections of grease duct. ~~except where specifically listed and labeled for such partial application.~~ Exposed duct-wrap systems shall be protected where subject to physical damage.

**Committee Action:**

**Approved as Modified**

**Committee Reason:** This product is being misapplied in some cases and some product installation instructions are silent on partial application. The revision is consistent with the intent of the code to require a continuous duct enclosure (i.e. no partial enclosures) and consistent with Section 506.3.6, Exception # 3. The modification deletes text that suggests that there are methods of testing for partial applications because there are none.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Tim Manz representing Association of Minnesota Building Officials (AMBO), requests Disapproval.**

**Commenter's Reason:** This issue is already addressed adequately in Exception #3 of Section 506.3.6, as the Committee Reason states, so there is no need for the proposed change to Section 506.3.10.2.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D

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## **M58-09/10**

### **506.3.10.4**

## Proposed Change as Submitted

**Proponent:** Tony Crimi, A.C. Consulting Solutions, Inc., representing the International Firestop Council

**Revise as follows:**

**506.3.10.4 Duct enclosure not required.** A duct enclosure shall not be required for a grease duct that penetrates only a non fire-resistance-rated roof/ceiling assembly. Grease duct systems and exhaust equipment serving Type I hoods shall comply with the requirements of section 506.3.6.

**Reason:** The proposed change clarifies that while a duct enclosure is not required for a grease duct that penetrates only a non fire-resistance-rated roof/ceiling assembly, the clearances of grease duct systems and exhaust *equipment* serving a Type I hoods still need to comply with the requirements of section 506.3.6 to both combustible and non-combustible construction.

**Justification:** This proposal clarifies the need to apply the existing provision in 506.3.6 of the Code for a grease duct that penetrates a non- fire-resistance-rated roof/ceiling assembly.. The IMC differentiates between requirements for grease duct systems and exhaust equipment serving a Type I hoods to maintain clearances to combustible and non-combustible construction, and the requirements to provide a duct enclosure. Section 506.3.10 waives the requirement to provide a duct enclosure in this specific instance. However, it is important that users understand that the allowance to waive the enclosure does not also waive the need to maintain clearances between these grease ducts and combustible and non-combustible construction as specified in 506.3.6.

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

ICCFILENAME: CRIMI-M-2-506.3.10.4

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**Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** There is no reason to refer to only one applicable provision because there are many.

**Assembly Action:**

**None**

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**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Tony Crimi, AC Consulting Solutions Inc, representing International Firestop Council, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**506.3.10.4 Duct enclosure not required.** A duct enclosure shall not be required for a grease duct that penetrates only a non fire-resistance-rated roof/ceiling assembly. Grease duct systems and exhaust *equipment* serving a Type I hood shall comply with the requirements of Section 506.3.6.

**Commenter's Reason:** Section 506.3.10 waives the requirement to provide a duct enclosure in this specific instance. However, the allowance to waive the enclosure does not also waive the need to maintain clearances as specified in 506.3.6. The proposed change clarifies that when a grease duct penetrates a non fire-resistance-rated roof/ceiling assembly, the clearances of grease duct systems and exhaust *equipment* serving a Type I hoods still need to comply with the requirements of section 506.3.6 for clearances to combustible and non-combustible construction.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D

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**M60-09/10**

**506.3.12.3**

**Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

**506.3.12.3 Termination location.** Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous buildings, adjacent buildings and adjacent property lines and shall be located not less than 10 feet (3048 mm) above the adjoining grade level. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from or not less than 3 feet (914 mm) above air intake openings into any building.

**Exception:** Exhaust outlets shall terminate not less than 5 feet (1524 mm) horizontally from parts of the same or contiguous building, an adjacent building, adjacent property line and air intake openings into a building where air from the exhaust outlet discharges away is not directed at any angle toward such points from such locations.

**Reason:** There is some confusion as to what exactly is meant by the term "away from the building" and what it actually permits. It would seem that the side of an up blast fan whether it is a utility set or centrifugal fan would be compliant with the 5-foot exception when the closest edge of the discharge is measured horizontally and no angle short of parallel would be compliant. This is a much needed clarification.

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

ICCFILENAME: MCMANN-M-20-506.3.12.3

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## Public Hearing Results

**Committee Action:**

**Disapproved**

**Committee Reason:** Disapproval is based upon the action taken on M59-09/10 which does a better job of clarifying the intent of this section.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Submitted.**

**Commenter's Reason:** The committee never addressed why this change was disapproved with respect to the bulk of the change. This language eliminates interpretation confusion with regards to what is meant by "away from the building".

Final Action:            AS                    AM                    AMPC\_\_\_\_\_            D

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## **M63-09/10**

### **507.2**

## Proposed Change as Submitted

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

**507.2 Where required.** A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2.1 and 507.2.2. 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.

**Exception:** Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application, a hood shall not be required at or above them.

**Reason:** This is an effort to recognize hoodless griddle type cooking appliances which are becoming more popular. Sometimes they are referred to as Hibachi Tables where generally smaller amounts of food are prepared in front of the customers directly at their table. These cooking tables have built-in downdraft exhaust systems running between 800 and 1000 cfm designed with two fans, one to push and one to draw air across the table. The cooking vapors are captured and delivered to a grease duct attached at the bottom of the table. All current IMC grease duct requirements apply at this point.

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

ICCFILENAME: MCMANN-M-25-507.2

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## Public Hearing Results

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**Revise Committee action as follows:**

**507.2 Where required.** A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2.1 and 507.2.2. 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.

**Exception:** 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.

**Commenter's Reason:** There's confusion over what the appropriate requirements are for these downdraft appliances and if an exception is to be provided, I believe the Code must specify the requirements used for listing. Chapter 15 of NFPA 96 was added to specifically address requirements for these systems.

**Analysis:** The standard, NFPA 96, was not reviewed or considered by the IMC Code Development committee and it was not considered by the hearing attendees at the time of the code development hearings. Section 3.6.3.1 of Council Policy #28, *Code Development*, requires that new standards be introduced in the original code change proposal, therefore, the introduction of a new standard via a public comment is not in accordance with the process required by CP# 28 for adding new standards to the code.

Final Action:                    AS                    AM                    AMPC\_\_\_\_                    D

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### **M64-09/10**

**507.2.1, 507.2.2**

### Proposed Change as Submitted

**Proponent:** Douglas J. Horton, D.J. HORTON and Associates, Inc., representing Commercial Kitchen Ventilation Technical Interest Group

**Revise as follows:**

**507.2.1 Type I hoods.** Type I hoods shall be installed where cooking *appliances* produce grease or smoke. Type I hoods shall be installed over *medium-duty, heavy-duty and extra-heavy-duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke.

**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<sup>3</sup> or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m<sup>3</sup>/s) in accordance with Section 17 of UL 710B.

**507.2.2 Type II hoods.** Type II hoods shall be installed above dishwashers and ~~light-duty appliances~~ appliances that produce heat or moisture and do not produce grease or smoke, 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 ~~light-duty appliances~~ appliances that produce products of *combustion* and do not produce grease or smoke. Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, 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<sup>2</sup>).

**Reason:** A growing issue is the proliferation of small appliances and related cooking in which little or no grease is produced, such as in convenience stores and other venues. Thus, a minimum threshold should be provided in the IMC to eliminate the expense of first cost, and energy costs of fan energy and tempering makeup air, where grease emissions are minimal or nonexistent. Such a minimum threshold already exists in codes and standards, and this proposal is provided to harmonize the IMC with NFPA Standard 96 and UL Standard 710B. NFPA 96 contains the threshold requirement and UL 710B, Section 17, contains the applicable test procedure. NFPA 96, in sections 4.1.1.2 and 4.1.1.3, exempts from exhaust systems cooking equipment that has grease discharge that does not exceed 5 mg/m<sup>3</sup> when tested at an exhaust airflow rate of 500 cfm (0.236 m<sup>3</sup>/s). Note that NFPA 96 is written entirely from a fire safety point of view, so only a Type I (in IMC terms) hood requirements are included in the standard.

State jurisdictions are beginning to pick up this exception in their adoptions of the IMC. For example, both Michigan and California mechanical codes either cite the grease test requirements explicitly or cite NFPA 96 for exhaust system requirements.

Editorial Note: The 2008 NFPA 96 cites UL 197 in sections 4.1.1.2 and 4.1.1.3, though the grease emissions test has been moved to Section 17 of UL 710B. Therefore, the proposed IMC exception should cite the actual grease emissions threshold requirement rather than citing NFPA 96, which contains the outdated reference.

In relation to Section 507.2.2, if a Type I hood is not required because of low grease emissions, per the first part of this proposal, the provisions of section 507.2.2 still apply, and a Type II hood may be required. This is problematic with the existing wording because Type II hoods are currently required only for dishwashers and light-duty appliances. Yet it is well known that appliances with duty ratings higher than light-duty produce heat and moisture while not producing grease or combustion products, such as electric ranges, electric pasta cookers, electric pizza ovens, and electric tilting skillets, for example. Accordingly, Type II hoods should be required for appliances based on their actual emissions of heat and moisture, regardless of duty. Of course, per current Section 507.2.2, additional HVAC capacity is still available as an alternative to use of a Type II hood.

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

ICCFILENAME: HORTON-M-1-507.2

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### **Public Hearing Results**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason. Having a measurable performance criteria is desired in applying the code. The proposed text is consistent with NFPA 96.

**Assembly Action:**

**None**

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### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Tony Crimi, A.C. Consulting Solutions Inc , representing International Firestop Council, requests Disapproval.**

**Reason:** The existing IMC requirement in 507.2.1 is very clear in requiring Type I hoods to be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances* and over *light-duty cooking appliances* that produce grease or smoke. The proposed change clouds the issue because it somehow gives credit for the power source of the appliance, when determining the need for the installation of a Type I hood for exhausting hazardous and flammable vapours emitting from the cooking medium (i.e. vegetable oils and fats).

There is insufficient justification provided as to the significance of the 5 mg/m<sup>3</sup>, and as to why this would apply only to electric heating appliances. The fact that the appliance is electric does not change the fact that it is a "*light-duty cooking appliances* that produce grease or smoke", as the current IMC requires.

Final Action: AS AM AMPC\_\_\_\_ D

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## **M72-09/10 507.3**

### **Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

**507.3 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.~~ Non-direct-vent appliances shall not be located in a room or space containing a Type I or Type II hood nor in a room or space that opens only into a room or space containing such hoods.

**Exception: Non-direct-vent appliances shall be permitted in a room or space containing a Type I or Type II hood provided that the room or space is continuously maintained under positive pressure.**

**Reason:** 507.3 only states that “provisions” need to be made when dealing with these types of appliances but provides no guidance as what is really required. This only creates confusion in the enforcement community as to what needs to occur. Non direct vent appliances and those with draft hoods are subject to many factors that could result in improper venting. Losses in building pressure will cause improper venting. It only takes 5 Pascal’s to overcome a gravity vent. These appliances are also in competition for air with other appliances and are no match for powered exhaust equipment such as hoods. The kitchen environment lends itself to negative pressure either by design or by accident. A perfectly balanced system never lasts very long as every minute detail affects them. Even kitchens with slight positive pressure can be subject to negative building pressures simply by opening doors. If kitchen pressures are even negative in the slightest or cannot be verified, then the appliance should be isolated. This text will provide the user with guidance that is more concise.

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

ICCFILENAME: MCMANN-M-15-507.3

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### **Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** The current text allows the designer to account for venting and pressure issues. Positive pressure maintenance could cause odor migration from the kitchen. The exception needs to identify the reference space to which the positive pressure is to be measured.

**Assembly Action:**

**None**

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### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows**

**507.3. Fuel burning appliances.** Non-direct vent appliances shall not be located in a room or space containing a Type I or Type II hood nor in a room or space that opens only into a room or space containing such hoods except where such room or space is continuously maintained under positive pressure with respect to the outdoors.

~~**Exception:** Non-direct vent appliances shall be permitted in a room or space containing a Type I or Type II hood provided that the room or space is continuously maintained under positive pressure.~~

**Commenter’s Reason:** The committee had a concern about pressure and what it was relative to. The relation to the outdoors was the intent and was added. Non-direct vent appliances usually means appliances with draft hoods. The word “provisions” is subjective to the inspection community and this text provides guidance as to the intention of the word. This text in no way removes options from designers that will prevent draft hood back-drafting that may be acceptable to the code official. The exception was incorporated into the body of the text as a clean-up effort.

Final Action:            AS                    AM                    AMPC\_\_\_\_\_            D

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**M73-09/10**  
**507.10**

### **Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Revise as follows:**

**507.10 Hoods penetrating a ceiling.** Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with ~~all the requirements of~~ Section 506.3.10. Field-applied grease duct enclosure systems, as addressed in Section 506.3.10.2, shall not be utilized to satisfy the requirements of this section.

**Reason:** Hoods penetrating ceilings that are also required to have the associated ductwork protected, are required to be enclosed in a 1 or 2 hour enclosure. Field applied duct-wrap systems are listed for ducts only, not hoods. Hoods have never been tested or listed to have duct-wrap materials placed over the hood as a replacement for a 1 or 2 hour enclosure. There is no standard for installation of duct-wrap systems on hoods. Nor is there a method of fastening or method of providing access to services located on top of the hood such as lights, J-boxes etc. To permit this practice only creates a false sense of security and code compliance. The manufacturers are aware that some jurisdictions allow this application but they don't condone the practice or seek to market their product in this fashion. The best practice is to not have the hood penetrate the ceiling in the first place. As currently written, 507.10 says that **all** the requirements of 506.3.10 should be met. This is misleading because two of the exceptions cannot be applied although they are part of the section. This is a much needed clarification that will provide concise guidance as to what exactly needs to occur when hoods are required to be protected when ceilings are penetrated.

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

ICCFILENAME: MCMANN-M-5-507.10

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### **Public Hearing Results**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** The proposed text will prevent the misuse of such materials. ASTM E 2336 does address the application prohibited by the proposed text.

**Assembly Action:**

**None**

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### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Tony Crimi, AC Consulting Solutions Inc, representing International Firestop Council, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**507.10 Hoods penetrating a ceiling.** Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with Section 506.3.10. ~~Field-applied grease duct enclosure systems, as addressed in Section 506.3.10.2, shall not be utilized to satisfy the requirements of this section.~~

**Commenter's Reason:** The language in the second sentence of this proposal targets a single technology, and prohibits its use in an application for which the IMC does not even provide a specific performance Standard or criterion. It is not entirely clear from the language of this proposal whether or not the use of Section 105.2 on Alternative materials, methods, equipment and appliances would still be possible.

The Committee's reason statement identifies ASTM E2336 as having no specific performance or testing requirements for enclosure of a Type 1 hood. While this is correct, it is equally true for UL 2221 and ASTM E119. There are other options in Section 506.3.10 which would still be permitted in this application, even though they are also not specifically tested for this use.

The *International Mechanical Code* is a model code that regulates the design and installation of mechanical systems, including appliance venting, duct and ventilation systems. The purpose of the code is to establish the minimum acceptable level of safety and to protect life and property from the potential dangers associated with the installation and operation of mechanical systems. While the IMC is primarily a prescriptive code with some performance text, the code relies heavily on product testing, specifications and listings to provide much of the appliance and equipment installation requirements. The general Section 105.2 allows designs and installations to be performed by approved engineering methods as alternatives to the prescriptive methods in the code. Section 105.2 specifically states "The provisions of this code are not intended to prevent the installation of any material or to prohibit any 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, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety."

The proposal, as modified by this public comment, clarifies the application of 506.3.10 without infringing on the code officials authority to use Section 105.2 if desired.

Final Action:

AS

AM

AMPC \_\_\_\_\_

D

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**M78-09/10**  
**510.8.1**

**Proposed Change as Submitted**

**Proponent:** Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

**Revise as follows:**

**510.8.1 Duct joints.** Ducts shall be made tight with lap joints having a minimum lap of 1 inch (25 mm). Joints used in ANSI/SMACNA Round Industrial Duct Construction Standards and ANSI/SMACNA Rectangular Industrial Duct Construction Standards are also acceptable.

**Reason:** The types of joints used in either of these manuals have been used in industrial exhaust and conveyance systems for years and provide acceptable alternatives to lap joints.

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

ICCFILENAME: HOWARD-M-7-510.8.1

**Public Hearing Results**

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standards did not comply with ICC standards criteria, Sections 3.6.2.1, 3.6.3.2.

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** The proposed text will provide for new technology and options to current practice and will help reduce duct leakage.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Jonathan Humble representing ICC Reference Standards Committee, requests Disapproval.**

**Commenter's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.2.1 which requires reference standards be written in mandatory language, and Section 3.6.3 which requires standards be promulgated according to a consensus process.

We therefore propose to have this code change proposal disapproved.

Final Action:            AS            AM            AMPC \_\_\_\_            D



**M83-09/10**  
**515 (New), 515.1 (New)**

**Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Add new text as follows:**

**SECTION 515**  
**COMMON MULTISTORY EXHAUST SYSTEMS**

**515.1 Common bathroom and toilet room exhaust in multistory buildings.** Where a common shaft is designed and installed to convey bathroom or toilet room exhaust, or both, in multiple story buildings, the construction of such system shall be in accordance with all of the following:

1. The building shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 of the International Building Code.
2. Shaft construction shall conform to Section 708 of the International Building Code.
3. Volume dampers, fire dampers and smoke dampers shall be prohibited in the exhaust duct. Penetrations of the shaft be protected in accordance with Section 607.5.5, Exception 2.
4. The shaft shall be served by an exhaust fan located at the top of the shaft and such fan shall be specifically designed for the intended application.
5. The exhaust fan shall run continuously and maintain negative pressure in the shaft at all times.
6. The exhaust fan operation shall be monitored in an approved location and shall initiate an audible or visual signal when the fan is not in operation.
7. Makeup air shall be provided for the spaces served in accordance with Section 501.3.
8. A cleanout opening of an approved size shall be located at the base of the shaft to provide access for inspection.
9. Screens installed at termination points shall comply with Section 501.2.2.

**Reason:** This proposal provides guidance as to the correct way to construct a sub-duct system utilizing a shaft constructed in accordance with the building code as long as that building is sprinkled. This method has been around for years and is an economical way to provide a method of exhausting bathroom exhaust in multi-story buildings without having to install fire and smoke dampers in the shaft. Dryer and kitchen exhaust would be prohibited in this scenario. This method when installed correctly can be located in any occupancy. Normally this would be practical in buildings of 4 stories or more and most commonly be employed in hotels.

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

ICCFILENAME: MCMANN-M-26-515

**Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** Volume dampers need to be allowed. A cleanout opening in the shaft is unnecessary for this application. The proposed text creates a conflict with Section 607.5.5 regarding fire damper options. Item # 3 is confusing.

**Assembly Action:**

**None**

## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

### *Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

#### **SECTION 515**

#### **Common Multistory Bathroom Sub Duct Exhaust Systems**

**515.1 Common bathroom exhaust sub-duct systems located in multi-story buildings.** Where a common shaft is designed and installed to convey bathroom exhaust, or toilet room exhaust, or both, in multiple story buildings, the construction of such system shall be in accordance with all of the following:

- ~~1. The building shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Building Code*.~~
1. Shaft construction shall conform to Section 708 of the *International Building Code*.
- ~~3. Volume dampers, fire dampers and smoke dampers shall be prohibited in the exhaust duct. Penetrations of the shaft shall be protected in accordance with Section 607.5.5 Exception 2.~~
2. Shaft penetrations shall be accomplished utilizing steel exhaust sub ducts having a minimum thickness of 0.0187 inch (0.4712 mm) ( No. 26 gage) extending 22 inches vertically in the shaft. Shaft penetration protection shall be in accordance with Section 607.5.5.
3. The shaft shall be served by an exhaust fan located at the top of the shaft, ~~and s~~ Such fan shall be specifically designed for the intended listed and tested for the application.
- ~~4.~~ 4. The exhaust fan shall run continuously and maintain negative pressure in the shaft at all times.
- ~~5.~~ 5. The exhaust fan operation shall be monitored in an approved location and shall initiate an audible or visual signal when the fan is not in operation.
- ~~7.~~ 6. Makeup air shall be provided for the spaces served in accordance with Section 501.3.
- ~~8.~~ A cleanout opening of an approved size shall be located at the base of the shaft to provide access for inspection.
- ~~9.~~ Screens installed at termination points shall comply with Section 501.2.2

**Commenter's Reason:** The committee said to make the modifications and bring it back. One concern was that the word "sub duct" wasn't in the heading. Another was prohibiting volume dampers in which the committee was correct. Volume dampers may be needed for balancing. Another concern was a cleanout wasn't required so that provision was removed. The reference to sub ducts extending 22 inches in the shaft was also added along with some general cleanup. Not including kitchen exhaust here is intentional although the Building Code permits it. The affect grease might have on drywall is not apparent at this time.

Final Action:                      AS                      AM                      AMPC \_\_\_\_\_                      D

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## **M85-09/10**

### **202, 602.1, 603.18 (New)**

### **Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

#### **1. Delete and substitute as follows:**

~~**602.1 General.** Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a plenum.~~

**602.1 General.** The following shall be considered to be an air plenum:

1. Interstitial spaces above ceilings and below floors.
2. Stud wall cavities and spaces between solid floor joists utilized in accordance with Section 602.3
3. Boxes or chambers constructed to support air handlers and furnaces and to collect return air for such furnaces and air-handlers.
4. Mechanical room enclosures used to convey return air to air-handlers therein.

Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed in plenums.

**2. Add new definition and text as follows:**

**DUCT PLENUM** A box or chamber constructed of duct materials and used to collect air from or supply air to other ducts. Such plenums typically connect to the inlets and outlets of furnaces and air handlers.

**603.18 Duct plenums.** Duct plenums shall be constructed as required for ducts in accordance with Section 603.

**Reason:** This is only an attempt for the body of the code to recognize the use of various plenums found in most HVAC systems. Currently the code only speaks of plenums that take the form of structural components. The word "plenum" has been used in the trade for many years and can be most commonly found in residential applications but applies to many commercial systems as well. Sometimes large plenums are built as "fan houses" employing vane axial equipment. Plenums can be very big or small and never be part of the structure. Furnaces sometimes sit on top of plenum boxes. Many attic installations employ a plenum for flex duct distribution and so on. Using an attic or crawl space as a plenum makes little sense. Some of the problems associated with these types of designs are leakage, plenum heat loss, mold and moisture control, acceptable outlet performance, cleanliness and odor control. Verifying these issues would be very difficult for any inspector and the smallest oversight could wreak havoc for a jurisdiction. This text will solve the duct plenum recognition issue.

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

ICCFILENAME: MCMANN-M-34-202-602.1-603.18

**Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed term "duct plenum" creates confusion with current plenum definitions. Item # 1 of proposed section 602.1 would classify all such spaces as plenums and then restrictions would apply to piping and other materials installed in such spaces.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**602.1 General.** ~~The following shall be considered an air plenum:-~~ Air plenums shall be limited to the following:

1. Interstitial spaces above ceilings and below floors.
2. ~~Interior~~ Interior stud wall cavities and spaces between solid floor joists utilized in accordance with Section 602.3
3. ~~Duct plenums. Boxes or chambers constructed to support air handlers and furnaces to collect return air for such furnaces and air handlers.~~
4. Mechanical room enclosures used to convey return air to air-handlers therein.

Plenums shall be limited to one fire area. Fuel-fired appliance shall not be installed in plenums.

**DUCT PLENUM** A box or chamber constructed of duct materials and used to collect air from or supply air to other ducts, equipment or appliances. ~~Such plenums typically connect to the inlet and outlet sides of furnaces and air handlers.~~

**603.18 Duct plenums.** Duct plenums shall be constructed as required for ducts in accordance with Section 603.

**Commenter's Reason:** The committee didn't care for the word "considered" so it was removed. Exterior wall building cavities are no longer condoned to be utilized as an air plenum. # 3 now refers to the new definition as the definition explains how duct plenums are intended to be used. The words "equipment and appliances" was added for clarification and the last sentence of the definition could be construed as commentary. The intent of this proposal was to house all requirements for plenums in one place for convenience to the user. The current code text only acknowledges structural components as plenums. There are no definitions in the IMC defining what a duct plenum is.

Final Action: AS AM AMPC\_\_\_ D

**M87-09/10**  
**602.2.1**

**Proposed Change as Submitted**

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

**Revise as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums shall be noncombustible or 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 E 84 or UL 723.

**Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
  - 5.1. continuous noncombustible raceways or enclosures
  - 5.2. approved gypsum board assemblies
  - 5.3. ~~or within~~ materials listed and labeled for such application as part of a tested assembly or system.

**Reason:** The issue of what materials are considered acceptable for exposure in a plenum is a life safety issue. The proposed change format of Exception 5 is to clarify that any one of these three options are only permitted when the combustible material is fully enclosed. The third option in Exception 5 is not clear as to what is meant by "for such application". This "protecting" material needs to provide sufficient protection of the combustible material during the event of a fire. Thus, to determine if the "protecting" material will remain in place during the event of a fire and not expose the combustible material to the fire, then the "protecting material" and the combustible material needs to be tested as an assembly or system.

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

ICCFILENAME: EUGENE-M-15-602.2.1

**Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** The revised text is confusing. Other means such as smoke detection should be pursued to lessen the hazard in plenums. There is no standard for testing and listing the assemblies and systems referred to in item 5.3.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums shall be noncombustible or 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 E 84 or UL 723.

**Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.

3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
  - 5.1. continuous noncombustible raceways or enclosures
  - 5.2. approved gypsum board assemblies
  - 5.3. materials listed and labeled ~~as part of a tested assembly or system~~ for installation within a plenum.

**Commenter's Reason:** The issue of what materials are considered acceptable for exposure in a plenum is a life safety issue. The proposed change format of Exception 5 is to clarify that any one of these three options are only permitted when the combustible material is fully enclosed. The third option in Exception 5 is not clear as to what is meant by "for such application". This "protecting" material needs to provide sufficient protection of the combustible material during the event of a fire.

Final Action:                      AS                      AM                      AMPC\_\_\_\_                      D

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## M88-09/10

### 602.2.1

#### **Proposed Change as Submitted**

**Proponent:** Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

**Revise as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums, and the exposed surfaces of the materials of construction of the plenums containing the materials, shall be noncombustible or 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 E 84 or UL 723.

**Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

**Reason:** This code proposal is just clarification. Materials of construction of the plenum need to comply with the requirements to be noncombustible or to have a flame spread index of no more than 25 and a smoke developed index of no more than 50 when tested to ASTM E 84. Plenums cannot be constructed of combustible materials unless they comply with those requirements.

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

ICCFILENAME: HIRSCHLER-M-4-602.2.1

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#### **Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed revision conflicts with current Section 602.2 and Section 602.2 is the appropriate place for such revision.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

### *Public Comment:*

**Marcelo M. Hirschler (GBH International), representing American Fire Safety Council and Robert J. Davidson (Davidson Code Concepts, LLC) representing self, requests Approval as Modified.**

Replace the proposal as follows:

**602.2 Construction.** Plenum enclosures for buildings of Types I and II construction shall be constructed of noncombustible materials. Plenum enclosures for all other buildings shall be constructed of materials that are noncombustible or that exhibit 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 E 84 or UL 723 permitted for the type of construction classification of the building.

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

**Commenter's Reason:** The technical committee was concerned that the proposal was placed in the wrong location because the requirements conflicted with the requirements of section 602.2 which would appear to allow plenum enclosures to be constructed of wood or other combustible building materials. This permission is not logical since all materials within plenums have to be noncombustible or meet the flame spread index and smoke-developed index requirements (25/50). Therefore, if the plenum enclosures can be made of wood, any fire would be able to spread along the walls of the plenum (wood typically has a flame spread index of up to 200) even with the best materials contained within the plenum. The revised language takes care of this by requiring that plenum enclosures are constructed of noncombustible materials for plenums in buildings of Types I and II construction and of materials that meet the same fire test requirements as the materials in the plenum for all other types of buildings.

Final Action:                    AS                    AM                    AMPC\_\_\_\_\_                    D

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## **M89-09/10**

### **602.2.1, 602.2.1.6**

## Proposed Change as Submitted

**Proponent:** Bob Eugene, representing Underwriter Laboratories, Inc.

### **1. Revise as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.6~~5~~, materials within plenums shall be noncombustible or shall be listed and labeled as having ~~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 E 84 or UL 723.

#### **Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.
6. 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.

### **2. Delete without substitution:**

~~**602.2.1.6 Semiconductor fabrication areas.** 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 shall not be subject to the provisions of Section 602.2.1.~~

**Reason:** Section 602.2.1.6 is an exception to Section 602.2.1. The issue of what materials are considered acceptable for exposure in a plenum is a life safety issue. Other combustible products in the plenum, such as wiring, fire sprinkler piping, pneumatic tubing, and electrical equipment, are required to be listed and labeled. Only listing and labeling of a product can verify that the product installed at a jobsite is composed of the same material originally tested.

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

ICCFILENAME: EUGENE-M-3-602.2.1

## Public Hearing Results

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

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### Individual Consideration Agenda

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*

**David W Ash, Lubrizol Advanced Materials Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or shall be listed and labeled as having 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 E 84 or UL 723.

**Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.
6. 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.

**Commenter's Reason:** This modification would preserve the current language as it pertains to the substantiation required to demonstrate a flame spread index of 25 or less and a smoke developed index of 50 or less. The proposal approved by the Technical Committee would require that all materials in a plenum, regardless of the amount, be both listed and labeled. Listing and labeling would be an additional requirement for the manufacturer and the cost of that process would most certainly be an added cost of construction contrary to the proponent's statement in the proposal.

No data has been presented that substantiates the position that the current language has created a safety concern.

*Public Comment 2:*

**Michael Cudahy representing PPFA (Plastic Pipe and Fittings Association), requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.65, materials within plenums shall be noncombustible or shall be listed and labeled as having 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 E 84 or UL 723.

**Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.
6. 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.

**Commenters Reason:** Adding "be listed and labeled as having" seems like a minor change in language, but it is a significant change in intent. That part of this change would increase the costs of construction and it is unclear if all manufacturers would chose to list and label every product that could potentially be used in a plenum space. Not every device or material is even described on how it should be tested to ASTM E84. This could unintentionally result in an inability to complete projects due to the lack of a few critical components and is a bad idea.

Redundant testing of existing products is simply unnecessary and a new burden on manufacturing at the worst possible time economically. PPFA urges the FAH to accept this modification.

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Final Action:            AS                            AM                            AMPC\_\_\_\_\_            D

**M90-09/10**  
**602.2.1, 602.2.1.7 (New)**

**Proposed Change as Submitted**

**Proponent:** Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

**1. Revise as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.67, materials within plenums shall be noncombustible or 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 E 84 or UL 723.

**Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

**2. Add new text as follows:**

**602.2.1.7 Plastic plumbing pipe.** Plastic drain, waste and vent piping exposed within a plenum shall comply with one or more of the following requirements:

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping 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 E 84 or UL 723.

**Reason:** As many have noted, the current version of ASTM E-84, while having been used to evaluate plastic pipe fire related properties for use in plenums, is not an ideal test method for this use. Amongst the reasons for this are the contents of the current version of the E-84 standard which is vague as to mounting methods and other test conditions for evaluating such pipe. For that reason, UL 1887, an existing test method based on technology which has been evaluated with considerable scrutiny and was developed to test and rate combustible fire sprinkler piping systems for use in plenum spaces is recommended in this case by PPFA.

With regard to enhancing the ASTM E-84 language, the ASTM E-5 committee is currently voting on changes to the current standard which will clarify mounting methods for plastic pipe materials in the tunnel making its results more comparable between materials and from material to material within a generic group. PPFA is also supporting development of new text for the E-84 standard referring and recommending that flamespread properties of plastic pipe for plenum applications be tested according to UL – 1887. UL has been consulted on the proposed change and does not oppose it. UL 1887 is already referenced in the IMC and is not a new standard.

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

ICCFILENAME: CUDAHY-M-2-602.2.1

**Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** The UL 1887 standard is not appropriate for DWV piping as it is not filled with water. The proposed revision will lessen safety with regard to smoke production.

**Assembly Action:**

**None**



## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

### *Public Comment 1:*

**Michael Cudahy representing PPFA (Plastic Pipe and Fittings Association), requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.7, materials within plenums shall be noncombustible or 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 E 84 or UL 723.

#### **Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

**602.2.1.7 Plastic water distribution plumbing pipe.** Plastic ~~water distribution drain, waste and vent~~ piping exposed within a plenum shall comply with one or more of the following requirements:

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping 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 E 84 or UL 723.

**Commenter's Reason:** The Committee's stated reasons for recommending disapproval were, "The UL 1887 standard is not appropriate for DWV piping as it is not filled with water. The proposed revision will lessen safety with regard to smoke production."

By making the modification above, the section would only apply to "wet" water distribution pipe and not DWV pipe. UL 1887 and the stated limits are already in the code, and are accepted parameters.

As many have noted, the current version of ASTM E-84, while having been used to evaluate plastic pipe for use in plenums, is not an ideal test method for this use. Amongst the reasons for this are the contents of the current version of the E-84 standard which is vague as to mounting methods and other test conditions for evaluating such pipe. For that reason, UL 1887, an existing test method based on technology which has been evaluated with considerable scrutiny and was developed to test and rate combustible fire sprinkler piping systems for use in plenum spaces is recommended in this case by PPFA. UL 1887 is simply a better tool in the tool box to rate plastic pipe of all kinds, not just plastic sprinkler pipe.

UL has been consulted on the proposed change and does not oppose it. UL 1887 is already referenced in the IMC and is not a new standard. PPFA urges the FAH to support this modification, which answers the stated reasons of the committee.

### *Public Comment 2:*

**Marcelo M. Hirschler (GBH International), representing American Fire Safety Council and Robert J. Davidson (Davidson Code Concepts, LLC) representing self, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.7, materials within plenums shall be noncombustible or 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 E 84 or UL 723.

#### **Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

**602.2.1.7 Plastic plumbing pipe.** Plastic ~~drain, waste and vent~~ piping exposed within a plenum shall comply with one or more of the following requirements:

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping 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 E 84 or UL 723.

**602.2.1.7 Plastic drain, waste and vent piping.** Plastic drain, waste and vent piping exposed within a *plenum* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Such piping shall be *listed* and *labeled*.

**Commenter's Reason:** The IMC code is silent with regard to plastic piping because plastic piping qualifies for use in plenums under the general requirements that all materials exposed within plenums must be noncombustible or be tested to ASTM E 84/UL 723 and get the 25/50 flame and smoke requirements. In fact most plastic materials that are used to make pipe can't meet those requirements. Therefore, what most plastic pipe manufacturers do is something "clever" that pretends to comply with the code but does not comply with the letter of the way ASTM E 84 is written. What is typically done is that the tests are conducted in the ASTM E 84 Steiner tunnel by stringing one pipe along the center of the tunnel and either (a) filling the pipe with water during the test and closing both ends, or (b) having water continuously run through the pipe from an outside source. It is much easier, of course, to meet the requirements that way. It is also not what is intended by the code, because the code intends to protect the building/structure at the time there is construction or alterations and when the pipe is empty.

The code also requires plastic fire sprinkler piping to be tested in accordance with UL 1887, as follows:

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

UL 1887 uses the same apparatus as ASTM E 84: the Steiner tunnel. In UL 1887 one length of sprinkler pipe is placed in the middle of the tunnel to conduct the test. The sprinkler pipe is empty and dry, without stoppers and of the thickness and overall width intended for use. In fact, UL 1887 is a test that was developed because it has always been understood that there can't be hundreds of fire sprinkler pipes in a plenum, as the sprinkler design does not permit that. In fact, similarly there can't be hundreds of drain, waste and vent pipes in the same area because they would interfere with the plenum air supply. Therefore, it would be appropriate to require that drain, waste and vent pipes be tested in exactly the same way as sprinkler pipes. Information on the UL 1887 requirements are contained in the UL Guide on UL 1887 (VIWT GuideInfo - Chlorinated Polyvinyl Chloride Sprinkler Pipe and Fittings).

The original proposal gave two options for testing pipe, one of which was to continue what is being done now, namely to test via ASTM E 84 full of water: that is not safe. I submitted a code proposal at the last cycle where the proposal required that the report indicate that the test was conducted without water. The proposal failed at final action because testimony said that code officials would not see that detail in the report and that it would create confusion. Therefore, accepting the proposal as written would allow plastic pipe manufacturers to keep testing that way and that is unacceptable.

What this comment recommends is that only the other option of the proposal be accepted and that it be made more severe so that it becomes just as severe as plastic sprinkler piping, in that the pipes must be tested in accordance with UL 1887, without use of water during the test and that the pipes must be listed and labeled and that the pipes can only be used in wet pipe systems.

The scope of UL 1887 is limited to fire sprinkler piping but UL has stated publicly that a change in the scope can be done, but only after the code requires pipes to be tested the same way as fire sprinkler pipes.

### *Public Comment 3:*

## **Joseph Zicherman, Fire Cause Analysis, representing Plastic Pipe and Fittings Association, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**602.2.1 Materials within plenums.** Except as required by Sections 602.2.1.1 through 602.2.1.7, materials within plenums shall be noncombustible or 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 E 84 or UL 723.

#### **Exceptions:**

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
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 continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

**602.2.1.7 Plastic plumbing pipe.** Plastic ~~drain, waste and vent~~ water distribution piping used in wet systems and exposed within a plenum shall comply with one or more of the following requirements:

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping 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 E 84 or UL 723.

**Commenter's Reason:** The intent of this proposal to the M-090 change text [as modified] is to provide a second, well known and widely accepted test method, UL-1887, to evaluate the acceptability of combustible supply piping to be used in plenum spaces. Such piping is used for hot and cold water supply but not as drain, waste and vent piping.

This action will complement the current standard, the ASTM E-84 test method, which is available to assess flamespread properties of combustible supply piping, and provide regulators and suppliers with the improved option of the UL test method to assess production of smoke by combustible piping.

While UL 1887 is specifically scoped for use with combustible sprinkler piping at the present time, it is my understanding from discussions with UL representatives that allowing for/requiring its utilization for combustible pressure piping, will not require modification of that standard. The membership should note that such piping is functionally equivalent to sprinkler piping in the application covered by the proposed code change. In all cases testing according to UL 1887 is carried out on empty piping, i.e. piping NOT including water or any other liquid. This was a concern stated by the Committee in its earlier deliberations. This test condition insures that under the proposal combustible piping will be tested according to

the most pessimistic scenario possible when comparing full or empty piping. This is because empty combustible piping is far more easily ignited and presents a greater smoke hazard than combustible piping that is full of water when they are compared directly.

The membership should also be aware that valid concerns have been raised that, on occasion, combustible piping has been tested develop flamespread and smoke developed indices in an E-84 furnace when it was full of water to.

Not surprisingly, such a testing condition yields lower E-84 flamespread results than when the same pipe is filled with water and then tested. The results of such testing practices are open to question.

As a result, currently a ballot measure assuring that piping materials shall not be tested containing water in the ASTM E-84 furnace is making its way thru the balloting process in the ASTM E-5 Committee (Fire Test Standards). In addition, mounting for E-84 testing conditions - in terms of amount of combustible pipe tested to provide E-84 data - have been under debate in ASTM. A change, requiring that tested items fill the furnace yielding full width testing in conjunction with the new requirement eliminating testing with liquid fill, will insure a more level playing field in testing combustible piping.

The combination of test methods that will result from enacting the proposed in the M-90 change as modified will enhance fire safety levels. At the same time the change will contribute to further the use of cost effective materials and installation techniques for users of the International Mechanical Code. Additionally, the inclusion of two test methods that eliminate the possibility of testing combustible pipe filled with water will reduce attendant possible levels of fire hazard when combustible pipe is used in air handling plenums. Adoption of the proposed change will also address the concerns of the committee in rejecting the original M-090 proposal.

Final Action:                    AS                    AM                    AMPC\_\_\_\_                    D

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## M93-09/10

### 602.2.1.2

#### **Proposed Change as Submitted**

**Proponent:** Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

**Revise as follows:**

**602.2.1.2 Fire sprinkler and water distribution piping.** Plastic fire sprinkler piping and water distribution piping exposed within a *plenum* shall comply with one or more of the following requirements: ~~be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Piping shall be listed and labeled.~~

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping 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 E 84 or UL 723.

Plastic fire sprinkler piping shall be listed and labeled. Plastic fire sprinkler piping exposed within a plenum shall be used only in wet pipe systems.

**Reason:** As many have noted, the current version of ASTM E-84, while having been used to evaluate plastic pipe fire related properties for use in plenums, is not an ideal test method for this use. This change addresses that situation and also extends the use of the test methods to other plastic piping materials that are currently being used in plenum spaces.

Amongst the reasons that ASTM E-84 has been criticized as a means to assess the fire performance of plastic pipe for plenum applications are the contents of the current version of the E-84 standard which are vague as to pipe mounting methods and amount of pipe exposed as well as other test conditions for evaluating plastic pipe. For that reason, UL 1887, an existing test method based on technology which has been evaluated with considerable scrutiny and was developed to test and rate combustible fire sprinkler piping systems for use in plenum spaces is recommended in this case by PPFA.

With regard to enhancing the ASTM E-84 language, the ASTM E-5 committee is currently voting on changes to the current standard which will clarify mounting methods for plastic pipe materials in the tunnel making its results more comparable between materials and from material to material within a generic group. PPFA is also supporting development of new text for the E-84 standard referring and recommending that flamespread properties of plastic pipe for plenum applications be tested according to UL – 1887. UL has been consulted on the proposed change and does not oppose it. UL 1887 is already referenced in the IMC and is not a new standard.

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

ICCFILENAME: CUDAHY-M-3-602.2.1

## Public Hearing Results

**Committee Action:**

**Disapproved**

**Committee Reason:** Disapproval is consistent with the action taken on M90-09/10.

**Assembly Action:**

**None**

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### Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Tim Manz representing Association of Minnesota Building Officials (AMBO) requests Approval as Submitted.**

**Modify the proposal as follows:**

**Commenter's Reason:** UL 1887 is an appropriate test for water distribution piping as specified in code change proposal M93, since it is normally full of water--just like plastic sprinkler piping. Unlike M90, code change proposal M93 deals with water distribution piping, not DWV piping as the Committee Reason suggests.

Final Action:                    AS                    AM                    AMPC\_\_\_\_                    D

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## **M96-09/10**

### **602.2.1.7 (New)**

### Proposed Change as Submitted

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

**Add new text as follows:**

**602.2.1.7 Plumbing and mechanical equipment in plenums. Where discrete plumbing and mechanical equipment, appurtenances and appliances are located in a plenum and have exposed combustible material, they shall be listed and labeled for such use in accordance with UL 2043.**

**Reason:** There are combustible plumbing and mechanical equipment, such as plumbing appurtenances, pipe and duct supports, grilles and registers that are used in plenums, that cannot be effectively tested in accordance with standards ASTM E84 or UL 723. The UL 2043 standard was developed to test products and materials not able to be tested in accordance with ASTM E84 or UL 723, and is currently adopted by reference in Section 602.2.1.4.2. These products are individual distinct pieces and non-continuous (i.e. "discrete"). This proposal was presented last cycle and the Committee had questions about the term "discrete". Per the dictionary, 'discrete' refers to products that are non-continuous, individual distinct pieces, as compared to non-discrete products such as cable or plastic pipe. If adopted this proposal will provide consistency in how the ICC codes treat discrete components in plenums.

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

ICCFILENAME: EUGENE-M-11-602.2.1.7

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## Public Hearing Results

**Committee Action:**

**Disapproved**

**Committee Reason:** The term "discrete" is subjective. UL 2043 is not equivalent to ASTM E 84 or UL 723. The proposed text is too broad in scope.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**602.2.1.7 Plumbing and mechanical equipment in plenums.** Where discrete, noncontinuous, plumbing and mechanical equipment, appurtenances and appliances are located in a plenum and have exposed combustible material, they shall be listed and labeled for such use in accordance with UL 2043.

**Commenter's Reason:** The term "noncontinuous" is added to clarify that individual distinct products or accessory pieces such as duct supports, grilles and registers are appropriate for installation within a plenum when compliant with the rate of heat release and the rate of smoke release of the burning product samples as they relate to the requirements for fire-resistant and low-smoke-producing characteristics in accordance with the provisions of the International Mechanical Code. These discrete, non-continuous products are not of a shape and design to be eligible for evaluation in accordance with ASTM E84 or UL723.

Final Action:                    AS                    AM                    AMPC\_\_\_\_                    D

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### **M100-09/10 603.5.2 (New)**

#### Proposed Change as Submitted

**Proponent:** James Karnes, representing Dura Tite Systems, LLC

**Add new text as follows:**

**603.5.2 Nonmetallic duct fittings.** Non-metallic forced air duct fittings that are considered discrete shall pass testing in accordance with UL 2043.

**Reason:** Under the current code, duct fittings are not addressed. It is assumed in most jurisdictions that a fitting is part of the duct system, and therefore nonmetallic fittings should be addressed under section 603.5 Nonmetallic Ducts. Section 603.5 states requirements for nonmetallic ducts to be constructed with Class 0 or Class 1 material as tested under UL 723 using ASTM E-84 method. This section generally pertains to duct board products, and are considered continuous building products. Fittings are not addressed, and cannot be tested using UL 723 (ASTM E-84) due to the size limitations of the test chamber. Discrete products can be alternately tested using UL2043.

Discrete is identified as a non-continuous building product, and the definition has been accepted by the IMC in the past for electrical products such as speaker boxes. The UL 2043 utilizes a test chamber that is 24 inches cubed. UL 2043 is the alternate test method to UL 723, for discrete products.

This new sub-section will address nonmetallic fittings and clarify the standards for compliance within the code.

Toxicity of smoke is not tested for under UL 2043, nor under any other test method used in the codes. Toxicity of smoke is not a required test for any building product.

This section does not address plumbing fittings, which are generally solvent welded together, creating a continuous building product.

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

ICCFILENAME: KARNES-M-1-603.5.2

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#### Public Hearing Results

**Committee Action:**

**Disapproved**

**Committee Reason:** No pass/fail criteria is stated. The words "that are considered discrete" are subjective. There are no definitive limits stated in UL 2043. The words "forced air" used to describe fittings are odd because fittings are fittings regardless of the air type.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

### *Public Comment:*

**James Karnes representing DuraTite Systems, LLC, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**603.5.2 Nonmetallic Duct Fittings.** ~~Non-metallic forced air duct fittings that are considered discrete shall pass testing~~ be listed and labeled in accordance with UL 2043.

**Commenter's Reason:** The proposed modification responds to the comments by the Committee. The section has been modified to require listing and labeling of nonmetallic duct fittings to UL 2043.

The Committee was confused by the reference to UL 2043. They thought that there needs to be end point criteria specified when you reference the standard. That is not true since the standard specifies a peak rate of heat release not greater than 100 kilowatts, a peak optical density not greater than 0.50, and an average optical density not greater than 0.15.

The requirements for nonmetallic duct fittings is unclear in the Mechanical Code. Without a specific reference, it is often thought that Section 603.5 is the applicable section. However, UL 181 is not the standard used for testing non-metallic duct fittings. UL 181 does refer to UL 2043 in its scope to deal with non-metallic mechanical fasteners which are discrete, non-continuous parts of the duct system.

UL 2043 ("Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces") is the appropriate testing standard for non-continuous building products ("discrete") and is accepted by reference in the code section 602.2.1.4 (Combustible Electrical Equipment). The UL 2043 Standard covers discrete electrical, plumbing, and mechanical products that are to be used within the air-handling space.

This new section is necessary to add the appropriate regulations and acceptance criteria for non-metallic duct fittings.

Final Action:                    AS                    AM                    AMPC\_\_\_\_\_                    D

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## **M102-09/10, Part I**

### **603.7 (New)**

### Proposed Change as Submitted

**Proponent:** Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

#### **PART I – IMC**

**Add new text as follows:**

**603.7 Above ground plastic ducts.** Plastic ducts and fittings not listed in compliance with UL 181 shall be prohibited above grade.

**Reason: (PART I)** Current code fails to say anything about the use of plastic ducts and fittings above grade. Section 603.8 is titled "underground ducts" and that's the only place that references an approved installation for plastic duct. Unfortunately, some believe that since they are not strictly prohibited they must be permitted, even absent code guidance for the installation. Until such time as industry comes out with an accepted standard and installation criteria similar to what is required for plumbing piping and fittings, the mechanical code needs to take a position on the use of the material.

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

ICCFILENAME:T OMBERLIN-M-10-603.7-RM-3-M1601.1.2

### Public Hearing Results

#### **PART I - IMC**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed text limits plastic technologies. Fittings cannot be tested to UL 181 therefore the proposed text creates an impossibility.

**Assembly Action:**

**None**

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## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), requests Approval as Submitted.**

**Commenter's Reason:** Part of the committee's reason for disapproval stated that the fittings for these systems cannot be tested to UL 181. With that said, and the disapproval of the committee, we are to condone the installation of above ground plastic ducts that are not tested to a nationally recognized standard. That's completely contradictory to IMC 301.5.1 which requires mechanical equipment to be labeled to a relevant standard. UL 181 is the relevant standard for plastic duct systems, which of course would have to include any fittings used with that duct system.

Final Action:                    AS                    AM                    AMPC\_\_\_\_\_                    D

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### **M102-09/10, Part II IRC M1601.1.2 (New)**

#### **Proposed Change as Submitted**

**Proponent:** Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

#### **PART II – IRC MECHANICAL**

**Add new text as follows:**

**M1601.1.2 Prohibited ducts.** Plastic ducts and fittings not listed as in compliance with UL 181 shall be prohibited above grade.

(PART II) Current code fails to say anything about the use of plastic ducts and fittings above grade. The only reference is existing Section 1601.1.2 titled "underground ducts," and that's the only place that references an approved installation for plastic duct. Unfortunately, some believe that since they are not strictly prohibited they must be permitted, even absent code guidance for the installation. Until such time as industry comes out with an accepted standard and installation criteria similar to what is required for plumbing piping and fittings, the mechanical code needs to take a position on the use of the material.

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

ICCFILENAME:T OMBERLIN-M-10-603.7-RM-3-M1601.1.2

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#### **Public Hearing Results**

#### **PART II - IRC**

**Committee Action:**

**Disapproved**

**Committee Reason:** Fittings cannot be tested to UL 181 and UL 181 is not the appropriate standard for plastic ducts. Plastic solvent-welded ducts should be encouraged for energy efficiency. Exposed DWV PVC plastic is acceptable, so why not PVC ducts ?

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), requests Approval as Submitted.**

**Commenter's Reason:** Part of the committee's reason for disapproval stated that the fittings for these systems cannot be tested to UL 181. With that said, and the disapproval of the committee, we are to condone the installation of above ground plastic ducts that are not tested to a nationally recognized standard. That's completely contradictory to IMC 301.5.1 which requires mechanical equipment to be labeled to a relevant standard. UL 181 is the relevant standard for plastic duct systems, which of course would have to include any fittings used with that duct system.

Final Action:                      AS                      AM                      AMPC \_\_\_\_\_                      D

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### **M106-09/10 603.10**

#### Proposed Change as Submitted

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Delete and substitute as follows:**

~~**603.10 Supports.** Ducts shall be supported with approved hangers at intervals not exceeding 10 feet (3048 mm) or by other approved duct support systems designed in accordance with the International Building Code. Flexible and other factory-made ducts shall be supported in accordance with the manufacturer's installation instructions.~~

**603.10 Supports.** Ducts shall be supported in accordance with Chapter 5 of the SMACNA HVAC Duct Construction Standards- Metal and Flexible or by other approved supporting systems. Flexible and other factory-made ducts shall be supported in accordance with the manufacturer's installation instructions.

**Reason:** The SMACNA Standard permits some sizes to be supported at intervals greater than 10 feet such as 4 inch. The IBC does not govern how ducts are to be supported, that's between the IMC and SMACNA. The code official can approve any engineered system with proper back-up.

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

ICCFILENAME: MCMANN-M-37-603.10

#### Public Hearing Results

**Committee Action:**

**Disapproved**

**Committee Reason:** The 10 foot interval proposed for deletion gave good guidance. The proposed text offers no guidance for the approval of other support methodologies.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

### *Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

#### **Modify the proposal as follows:**

**603.10 Supports.** Ducts shall be supported ~~at intervals not to exceed 12 feet and shall be~~ in accordance with ~~Chapter 5 of the~~ SMACNA HVAC Duct Construction Standards Metal and Flexible ~~or by other approved supporting systems~~. Flexible and other factory-made ducts shall be supported in accordance with the manufacturers' installations instructions.

**Commenter's Reason:** The committee wanted to keep a maximum support interval stated and didn't care for the statement "or by other approved supporting systems". It's appropriate that the SMACNA Standard be referenced here because all the requirements for supports are there. The user can pick from the many supporting methods found in the standard that may fit a particular need.

Final Action:                    AS                    AM                    AMPC\_\_\_\_                    D

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## **M120-09/10**

### **908.1**

### Proposed Change as Submitted

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

#### **Revise as follows:**

**908.1 General.** A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's installation instructions. Cooling towers shall comply with UL 1995.

**Reason:** UL 1995 is already referenced in Chapter 15. UL 1995 includes a comprehensive set of construction and performance requirements that are used to evaluate and list cooling towers, and is already adopted by reference in other sections of the IMC.

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

ICCFILENAME:Eugene-M-22-908.1

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### Public Hearing Results

**Committee Action:**

**Disapproved**

**Committee Reason:** Rebuilt or rehabilitated cooling towers would have to be listed if they were not already listed before they could be reused or reinstalled. An optional standard is needed. Major components such as cooling towers should not be required to be listed. Some towers are huge structures that might not be able to be listed.

**Assembly Action:**

**None**

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## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**908.1 General.** A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's installation instructions. Factory-built cooling towers shall comply be listed in accordance with UL 1995.

**Commenter's Reason:** UL 1995 is already referenced in Chapter 15. UL 1995 includes a comprehensive set of construction and performance requirements that are used to evaluate and list cooling towers, and is already adopted by reference in other sections of the IMC. It is appropriate that factory-built cooling towers be listed.

Final Action:                    AS                    AM                    AMPC\_\_\_\_\_                    D

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### **M125-09/10 928 (New), Chapter 15**

#### **Proposed Change as Submitted**

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

**1. Add new text as follows:**

#### **SECTION 928 RADIANT HEATING SYSTEMS**

**928.1 General.** Electric radiant heating systems shall be installed in accordance with the manufacturer's installation instructions and shall be listed for the application. Electric radiant heating panels and heating panel sets shall comply with UL 1693. Electric space heating cables shall comply with UL 1673.

**928.2 Clearances.** Clearances for radiant heating panels or elements to any wiring, outlet boxes and junction boxes used for installing electrical devices or mounting luminaires shall be in accordance with NFPA 70.

**928.3 Installation on wood or steel framing.** Radiant panels installed on wood or steel framing shall conform to the following requirements:

1. Heating panels shall be installed parallel to framing members and secured to the surface of framing members or shall be mounted between framing members.
2. Mechanical fasteners shall penetrate only the unheated portions provided for this purpose. Panels shall not be fastened at any point closer than ¼ inch (7 mm) to an element. Other methods of attachment of the panels shall be in accordance with the panel installation instructions.
3. Unless listed and labeled for field cutting, heating panels shall be installed as complete units.

**928.4 Installation in concrete or masonry.** Radiant heating systems installed in concrete or masonry shall conform to the following requirements:

1. Radiant heating systems shall be identified as being suitable for the installation, and shall be secured in place as specified in the manufacturer's installation instructions.
2. Radiant heating panels and radiant heating panel sets shall not be installed where they bridge expansion joints unless protected from expansion and contraction.

**928.5 Finish surfaces.** Finish materials installed over radiant heating panels and systems shall be installed in accordance with the manufacturer's installation instructions. Surfaces shall be secured so that fasteners do not pierce the radiant heating elements.

**2. Add new standards to Chapter 15 as follows:**

**UL**

1673-96 Electric Space Heating Cables – with revisions through July 2003

1693-02 Electric Radiant Heating Panels and Heating Panel Sets

**Reason:** The requirements included in this new section cover the installation of radiant heating systems. They are based on requirements included in Section M1406 of the International Residential Code. UL 1673 and UL 1693 are the standards used to investigate and list electric space heating cables and electric radiant heating panels. Over 20 companies have listings for these products.

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

**Analysis:** Review of proposed new standards UL 1673-96 and UL 1693-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-21-928-CH 15

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**Public Hearing Results**

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standards did not comply with ICC standards criteria, Section 3.6.3.2.

**Committee Action:**

**Disapproved**

**Committee Reason:** The clearance inspection requirement of proposed Section 928.2 is not enforceable because of the reference to NFPA 70.

**Assembly Action:**

**None**

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**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**SECTION 928  
RADIANT HEATING SYSTEMS**

**928.1 General.** Electric radiant heating systems shall be installed in accordance with the manufacturer's installation instructions and shall be listed for the application. ~~Electric radiant heating panels and heating panel sets shall comply with UL 1693. Electric space heating cables shall comply with UL 1673.~~

**928.2 Clearances.** Clearances for radiant heating panels or elements to any wiring, outlet boxes and junction boxes used for installing electrical devices or mounting luminaires shall be in accordance with the International Building Code and NFPA 70.

**928.3 Installation on wood or steel framing.** Radiant panels installed on wood or steel framing shall conform to the following requirements:

1. Heating panels shall be installed parallel to framing members and secured to the surface of framing members or shall be mounted between framing members.
2. Mechanical fasteners shall penetrate only the unheated portions provided for this purpose. Panels shall not be fastened at any point closer than ¼ inch (7 mm) to an element. Other methods of attachment of the panels shall be in accordance with the panel installation instructions.
3. Unless listed and labeled for field cutting, heating panels shall be installed as complete units.

**928.4 Installation in concrete or masonry.** Radiant heating systems installed in concrete or masonry shall conform to the following requirements:

1. Radiant heating systems shall be identified as being suitable for the installation, and shall be secured in place as specified in the manufacturer's installation instructions.
2. Radiant heating panels and radiant heating panel sets shall not be installed where they bridge expansion joints unless protected from expansion and contraction.

**928.5 Finish surfaces.** Finish materials installed over radiant heating panels and systems shall be installed in accordance with the manufacturer's installation instructions. Surfaces shall be secured so that fasteners do not pierce the radiant heating elements.

**UL**  
~~1673-06 Electric Space Heating Cables – with revisions through July 2003~~  
~~1693-02 Electric Radiant Heating Panels and Heating Panel Sets~~

**Commenter's Reason:** The requirements included in this new section cover the installation of radiant heating systems. They are based on requirements included in Section M1406 of the International Residential Code. Over 20 companies have listings for these products. UL 1673 and UL 1693 have been deleted because, in the opinion of ICC staff, the standards did not comply with ICC standards criteria, Section 3.6.3.2. The International Building Code has been added to Section 928.2 to assure that the clearances required by NFPA 70 can be enforced.

Final Action:                    AS                    AM                    AMPC \_\_\_\_\_                    D

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## M127-09/10, Part I

### 1002.1, Chapter 15

#### **Proposed Change as Submitted**

#### **PART I – IMC**

##### **1. Revise as follows:**

**1002.1 General.** Potable water heaters and hot water storage tanks shall be listed and labeled and installed in accordance with the manufacturer's installation instructions, the *International Plumbing Code* and this code. All water heaters shall be capable of being removed without first removing a permanent portion of the building structure. The potable water connections and relief valves for all water heaters shall conform to the requirements of the *International Plumbing Code* . Domestic electric water heaters shall comply with UL 174 or UL 1453. Commercial electric water heaters shall comply with UL 1453. Oil-fired water heaters shall comply with UL 732. Solid-fuel-fired water heaters shall comply with UL 2523. Thermal solar water heaters shall comply with Chapter 14 and UL 174 or UL 1453.

##### **2. Add new standard to Chapter 15 as follows:**

**UL**  
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

**Reason:** The UL Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired water heaters. UL 174 is the standard used to evaluate and list thermal solar water heaters.

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

**Analysis:** Review of proposed new standard UL 2523-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-23-1002.1-CH 15-RM-21-M2005.1-CH 44

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#### **Public Hearing Results**

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.3.2.

#### **PART I - IMC**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

### *Public Comment 1:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

#### **PART I – IMC**

**1002.1 General.** Potable water heaters and hot water storage tanks shall be listed and labeled and installed in accordance with the manufacturer's installation instructions, the *International Plumbing Code* and this code. All water heaters shall be capable of being removed without first removing a permanent portion of the building structure. The potable water connections and relief valves for all water heaters shall conform to the requirements of the *International Plumbing Code* . Domestic electric water heaters shall comply with UL 174 or UL 1453. Commercial electric water heaters shall comply with UL 1453. Oil-fired water heaters shall comply with UL 732. Solid-fuel-fired water heaters shall comply with UL 2523. Thermal solar water heaters shall comply with Chapter 14 and UL 174 or UL 1453.

**UL**  
~~2523-09 Outline of Investigation for Solid Fuel-Fired Hydronic Heating Appliances.~~

**Committer's Reason:** The First Edition of ANSI/UL 2523 includes requirements that cover solid fuel-fired hydronic heating appliances, water heaters, and boilers was issued December 22, 2009.

### *Public Comment 2:*

**Jonathan Humble (Chairman) representing ICC Reference Standards Committee, requests Approval as Modified.**

Modify the proposal as follows:

#### **PART I – IMC**

**1002.1 General.** Potable water heaters and hot water storage tanks shall be listed and labeled and installed in accordance with the manufacturer's installation instructions, the *International Plumbing Code* and this code. All water heaters shall be capable of being removed without first removing a permanent portion of the building structure. The potable water connections and relief valves for all water heaters shall conform to the requirements of the *International Plumbing Code* . Domestic electric water heaters shall comply with UL 174 or UL 1453. Commercial electric water heaters shall comply with UL 1453. Oil-fired water heaters shall comply with UL 732. ~~Solid-fuel-fired water heaters shall comply with UL 2523.~~ Thermal solar water heaters shall comply with Chapter 14 and UL 174 or UL 14

**UL**  
~~2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers~~

**Committer's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process.

We therefore propose to have deleted the reference standard and subsequent reference to that standard as part of this proposal to modify the original proposal.

Final Action:            AS                    AM                    AMPC \_\_\_\_\_            D

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# M127-09/10, Part II

## IRC M2005.1, Chapter 44

### Proposed Change as Submitted

#### PART II – IRC MECHANICAL

##### 1. Revise as follows:

**M2005.1 General.** Water heaters shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. Water heaters installed in an attic shall conform to the requirements of Section M1305.1.3. Gas-fired water heaters shall conform to the requirements in Chapter 24. Domestic electric water heaters shall conform to UL 174 or UL 1453. Commercial electric water heaters shall conform to UL 1453. Oiled-fired water heaters shall conform to UL 732. Thermal solar water heaters shall comply with Chapter 23 and UL 174. Solid-fuel-fired water heaters shall comply with UL 2523.

##### 2. Add new standard to Chapter 44 as follows:

**UL**  
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

**Reason:** The UL Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired water heaters. UL 174 is the standard used to evaluate and list thermal solar water heaters.

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

**Analysis:** Review of proposed new standard UL 2523-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-23-1002.1-CH 15-RM-21-M2005.1-CH 44

### Public Hearing Results

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.3.2.

#### PART II - IRC

##### Committee Action:

**Approved as Submitted**

**Committee Reason:** Approval was based on the proponent's printed reason.

##### Assembly Action:

**None**

### Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

#### *Public Comment 1:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

#### PART II – IRC

**M2005.1 General.** Water heaters shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. Water heaters installed in an attic shall conform to the requirements of Section M1305.1.3. Gas-fired water heaters shall conform to the requirements in Chapter 24. Domestic electric water heaters shall conform to UL 174 or UL 1453. Commercial electric water heaters shall conform to UL 1453. **2010 ICC FINAL ACTION AGENDA**

conform to UL 1453. Oiled-fired water heaters shall conform to UL 732. Thermal solar water heaters shall comply with Chapter 23 and UL 174. Solid-fuel-fired water heaters shall comply with UL 2523.

**UL**  
2523-09 ~~Outline of Investigation for Solid Fuel-Fired Hydronic Heating Appliances.~~

**Commenter's Reason:** The First Edition of ANSI/UL 2523 includes requirements that cover solid fuel-fired hydronic heating appliances, water heaters, and boilers was issued December 22, 2009.

*Public Comment 2:*

**Jonathan Humble (Chairman) representing ICC Reference Standards Committee, requests Approval as Modified.**

**Modify the proposal as follows:**

**PART II-IRC**

**M2005.1 General.** Water heaters shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. Water heaters installed in an attic shall conform to the requirements of Section M1305.1.3. Gas-fired water heaters shall conform to the requirements in Chapter 24. Domestic electric water heaters shall conform to UL 174 or UL 1453. Commercial electric water heaters shall conform to UL 1453. Oiled-fired water heaters shall conform to UL 732. Thermal solar water heaters shall comply with Chapter 23 and UL 174. ~~Solid-fuel-fired water heaters shall comply with UL 2523.~~

**UL**  
~~2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers~~

**Commenter's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process.

We therefore propose to have deleted the reference standard and subsequent reference to that standard as part of this proposal to modify the original proposal.

Final Action:                    AS                    AM                    AMPC \_\_\_\_\_                    D

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**M128-09/10, Part I**  
**1004.1, Chapter 15**

**Proposed Change as Submitted**

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

**PART I – IMC**

**1. Revise as follows:**

**1004.1 Standards.** Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code* , Sections I or IV; NFPA 8501; NFPA 8502 or NFPA 8504.

**2. Add new standard to Chapter 15 as follows:**

**UL**  
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

**Reason:** UL's Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired boilers.

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

**Analysis:** Review of proposed new standard UL 2523-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-25-1004.1-CH 15

### **Public Hearing Results**

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.3.2.

#### **PART I - IMC**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

#### **PART I – IMC**

**1004.1 Standards.** Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code* , Sections I or IV; NFPA 8501; NFPA 8502 or NFPA 8504.

#### **UL**

2523-09 ~~Outline of Investigation for~~ Solid Fuel-Fired Hydronic Heating Appliances.

**Commenter's Reason:** The First Edition of ANSI/UL 2523 includes requirements that cover solid fuel-fired hydronic heating appliances, water heaters, and boilers was issued December 22, 2009.

*Public Comment 2:*

**Jonathan Humble (Chairman) representing ICC Reference Standards Committee, requests Disapproval.**

#### **PART I – IMC**

**Commenter's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process. We therefore propose to have disapproved Parts 1 and 2 of M128-09/10.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D



# M128-09/10, Part II

## IRC M2001.1.1, Chapter 44

### Proposed Change as Submitted

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

#### PART II – IRC MECHANICAL

##### 1. Revise as follows:

**M2001.1.1 Standards.** Oil-fired boilers and their control systems shall be listed and *labeled* in accordance with UL 726. Electric boilers and their control systems shall be *listed* in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code*, Sections I and IV. Gas-fired boilers shall conform to the requirements listed in Chapter 24.

##### 2. Add new standard to Chapter 44 as follows:

**UL**  
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

**Reason:** UL's Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired boilers.

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

**Analysis:** Review of proposed new standard UL 2523-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-25-1004.1-CH 15

### Public Hearing Results

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.3.2.

#### PART II - IRC

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** : Approval was based on the proponent's printed reason.

**Assembly Action:**

**None**

### Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

*Public Comment 1:*

**Bob Eugene representing Underwriters Laboratories Inc, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

#### PART I – IRC

**M2001.1.1 Standards.** Oil-fired boilers and their control systems shall be listed and *labeled* in accordance with UL

726. Electric boilers and their control systems shall be *listed* in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code*, Sections I and IV. Gas-fired boilers shall conform to the requirements listed in Chapter 24.

UL  
2523-09 ~~Outline of Investigation for Solid Fuel-Fired~~ Hydronic Heating Appliances.

**Commenter's Reason:** The First Edition of ANSI/UL 2523 includes requirements that cover solid fuel-fired hydronic heating appliances, water heaters, and boilers was issued December 22, 2009.

### *Public Comment 2:*

**Jonathan Humble (Chairman) representing ICC Reference Standards Committee, requests Disapproval.**

#### PART II- IRC

**Commenter's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process. We therefore propose to have disapproved Parts 1 and 2 of M128-09/10.

Final Action:                    AS                    AM                    AMPC\_\_\_\_\_                    D

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## **M131-09/10, Part II**

### **IRC M1411.6**

***NOTE: PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART I IS REPRODUCED ONLY FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART II.***

### **Proposed Change as Submitted**

**Proponent:** Patrick A. McLaughlin, McLaughlin & Associates, representing the Air-Conditioning, Heating and Refrigeration Institute

#### **PART II – IRC MECHANICAL**

**Revise as follows:**

**M1411.6 Locking access port caps.** Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise protected from unauthorized access in an approved manner.

**Reason:** During the last code cycle, the provision requiring locking-type tamper-resistant caps to restrict access to refrigerants was approved at the Final Action Hearings. This proposal would expand the means of restricting access to other approved methods. An example would be the placement of the equipment in inaccessible locations. Also, we are aware of only one locking-type tamper-resistant cap.

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

ICCFILENAME: MCLAUGHLIN-M-2-1101.10-M1411.6

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### **Public Hearing Results**

#### **PART II – IRC**

**Modify the proposal as follows:**

**Revise as follows:**

**M1411.6 Locking access port caps.** Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent ~~protected from~~ unauthorized access. ~~in an approved manner.~~

**Reason:** During the last code cycle, the provision requiring locking-type tamper-resistant caps to restrict access to refrigerants was approved at the Final Action Hearings. This proposal would expand the means of restricting access to other approved methods. An example would be the placement of the equipment in inaccessible locations. Also, we are aware of only one locking-type tamper-resistant cap.

**Committee Action:**

**Approved as Modified**

**Committee Reason:** Approval was based on the proponent’s printed reason. The modification makes the text less restrictive, allowing more options.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Richard Grace, Fairfax County, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), ICC Region VII, requests Disapproval.**

**Commenter’s Reason:** The committee’s reason for approving this change with modification included being able to restrict access to equipment by placing the equipment in an inaccessible location. That works great for commercial applications because equipment can be placed in locked refrigeration rooms or on roofs with keyed access only by maintenance personnel. I do not know anywhere in a one- or two-family home or townhouse that equipment can be placed in a location that would prevent unauthorized access. A 6’ high fence around the property will not prevent unauthorized access from someone determined to huff these dangerous fumes, and I do not see condensing units installed on roofs of one- and two-family homes or townhouses. This is appropriate language for commercial applications, not for residential applications. This will only lessen the protection of personnel that was approved in the last code cycles’ final action hearings.

Final Action:            AS                    AM                    AMPC \_\_\_\_            D

**NOTE: PART I REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE**

**PART I – IMC**

**Revise as follows:**

**1101.10 Locking access port caps.** Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise protected from unauthorized access in an approved manner.

**PART II – IRC MECHANICAL**

**Revise as follows:**

**M1411.6 Locking access port caps.** Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise protected from unauthorized access in an approved manner.

**Reason:** During the last code cycle, the provision requiring locking-type tamper-resistant caps to restrict access to refrigerants was approved at the Final Action Hearings. This proposal would expand the means of restricting access to other approved methods. An example would be the placement of the equipment in inaccessible locations. Also, we are aware of only one locking-type tamper-resistant cap.

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

**PART I - IMC**

**Withdrawn by Proponent**

# M133-09/10, Part I

## 1101.11.1 (New)

### Proposed Change as Submitted

**Proponent:** Mona Casey, United Parents to Restrict Open Access to Refrigerant

#### **PART I – IMC**

**Add new text as follows:**

**1101.11.1 Existing systems.** Existing refrigerant circuit access ports that are located outdoors shall be retrofitted with locking-type tamper-resistant caps whenever the refrigerant system is modified, serviced, or repaired.

**Reason:** The purpose of this code modification is to add new requirements to the Code. The existing code does not address the issue of accessibility to refrigerant from pre-existing units by unauthorized individuals. Refrigerant is extremely dangerous and potentially lethal.

#### **Facts:**

Refrigerant “can cause death without warning”.

Refrigerant is considered a gateway drug because users often progress from refrigerant use to drug and alcohol abuse.

Refrigerant is not a cumulative substance where chances of dying from it increase as the dosage and number of use increases. It can kill on the 1<sup>st</sup>, 10<sup>th</sup>, 100<sup>th</sup>, or any other time. 33 percent of deaths resulting from refrigerant huffing occurred on the 1<sup>st</sup> use.

Refrigerant, like other poisons, must be kept out of reach of children.

Refrigerant theft is increasing.

According to Mike Opitz, Certification Manager, LEED for Existing Buildings, U.S. Green Building Council, chlorine in CFCs and HCFCs destroy the ozone and depletes the Earth’s natural shield for incoming ultraviolet radiation and absorb outgoing infrared radiation from the earth, functioning as potent greenhouse gases.

#### **National Statistics:**

The National Institute on Drug Abuse reports that one in five American teens have used Inhalants to get high.

According to Stephen J. Pasierb, President and CEO of The Partnership for Drug-Free America, 22% of 6th and 8th graders admitted abusing inhalants and only 3% of parents think their child has ever abused inhalants.

An analysis of 144 Texas death certificates by the Texas Commission on Alcohol and Drug Abuse involving misuse of inhalants found that the most frequently mentioned inhalant (35%) was Freon (51 deaths). Of the Freon deaths, 42 percent were students or youth with a mean age of 16.4 years.

Suffocation, inhaling fluid or vomit into the lungs, and accidents each cause about 15% of deaths linked to inhalant abuse.

National Institute on Drug Abuse’s ‘Monitoring the Future’ study reveals that inhalant abuse among 8th graders is up 7.7% since 2002.

55% of deaths linked to inhalant abuse are caused by “Sudden Sniffing Death Syndrome.” SSDS can occur on the first use or any use.

The

Inhalant causes the heart to beat rapidly and erratically, resulting in cardiac arrest.

22% of inhalant abusers who died of SSDS had no history of previous inhalant abuse. In other words, they were first-time users.

#### **Collier County, FL Statistics:**

The use of inhalants in middle schools has doubled in two years

The average age a child starts using drugs or alcohol is just 12½

Every third day a child is taken to the hospital because of a drug overdose

85 percent of all juvenile criminal cases are substance related

Deaths due solely to drug toxicity increased 76% between 1998 and 2005

The modification of this code will have an immense positive impact on the safety and health of our citizens, especially our youth. It will reduce the number of deaths associated with Inhalant abuse and the number of injuries associated with Freon accidents and leaks.

**Cost Impact:** The code change proposal will increase the cost of construction by \$20-\$25.

### Public Hearing Results

#### **PART I - IMC**

**Committee Action:**

**Disapproved**

**Committee Reason:** Legal action will likely ensue for those cases where the service personnel fail to install the devices. The locking caps are an “honest man’s” lock and if someone is intent on getting refrigerant from the system, they will find a way to overcome the locking caps. Refrigerant can be obtained by making a hole in the coil tubing or connecting piping. The service personnel should not be made responsible for this. The proposed text conflicts with the intent of Section 102.2.

**Assembly Action:**

**None**

## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

### *Public Comment 1:*

**Mona Casey representing United Parents to Restrict Open Access to Refrigerant, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

#### **PART I – IMC**

**1101.11.1 Existing systems.** Existing Air conditioning units with refrigerant circuit access ports that are located outdoors shall be retrofitted provided with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access whenever the refrigerant system is modified recharged, serviced, or repaired.

**Commenter's Reason:** At the previous code hearing, proposal PM14-09/10, which provides a trigger for securing existing refrigerant circuit access ports located outdoors, was approved by the Property Maintenance Committee. Because the IPMC has yet to be adopted by all states, it is important to add this provision to the IMC and IRC as well to ensure a broader adoption of the code. This proposed modification will standardize the language across all three codes.

### *Public Comment 2:*

**Julius Ballanco, PE, JB Engineering and Code Consulting PC, representing self, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

#### **PART I – IMC**

**1101.11.1 Existing systems.** Existing Air conditioning units with refrigerant circuit access ports that are located outdoors shall be retrofitted provided with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access whenever the refrigerant system is modified recharged, serviced, or repaired.

**Commenter's Reason:** The reason provided by the Mechanical Committee is not an appropriate comment. Service personnel are liable for everything they do when servicing equipment. This is merely one additional requirement. The other justification was that the change conflicts with Section 102.2. In fact, this proposal is consistent with Section 102.2.

This section does not apply to existing equipment. The section clearly establishes that the requirement is applicable when the system is recharged, serviced, or repaired. The system is the refrigerant circuit. Such a change is consistent with Section 102.4.

Another point discussed by both Committees was that the section is unenforceable. There are many sections of the code that are unenforceable. That doesn't mean that the code ignores those requirements. Just because a permit is not required does not mean that the installing contractor does not have to comply with the code. Case in point is any minor change to any building system. A permit is not required, but the change must be in accordance with the code.

What both Committees should have been focusing on is whether this section is necessary for the protection of health and safety. That has been answered previously with a big yes. Therefore, the change to the Mechanical Code and Residential Code should have been accepted. This is an inexpensive change that can save lives.

### *Public Comment 3:*

**Adam Deschamp representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

#### **PART I-IMC**

**1101.11.1 Securing refrigerant access ports.** Air conditioning units with refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A member of my friends' family died and others have died from how easy it is to access those parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

### *Public Comment 4:*

**Laura Pestano representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART I-IMC**

1101.11.1 Securing refrigerant access ports. Air conditioning units with refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 5:*

**Russell Phillips representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART I-IMC**

1101.11.1 Securing refrigerant access ports. Air conditioning units with refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 6:*

**Dana Prothro representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART I-IMC**

1101.11.1 Securing refrigerant access ports. Air conditioning units with refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** My daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 7:*

**Philippe Albert Schaedler representing Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART I-IMC**

1101.11.1 Securing refrigerant access ports. Air conditioning units with refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 8:*

**Michele Wagner representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART I-IMC**

1101.11.1 Securing refrigerant access ports. Air conditioning units with refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

Final Action: AS AM AMPC\_\_\_\_\_ D

# M133-09/10, Part II

## IRC M1411.6.1 (New)

### Proposed Change as Submitted

**Proponent:** Mona Casey, United Parents to Restrict Open Access to Refrigerant

#### PART II – IRC MECHANICAL

**Add new text as follows:**

**M1411.6.1 Existing HVAC systems.** Existing refrigerant circuit access ports that are located outdoors shall be retrofitted with locking-type tamper-resistant caps whenever the refrigerant system is modified, serviced, or repaired.

**Reason:** The purpose of this code modification is to add new requirements to the Code. The existing code does not address the issue of accessibility to refrigerant from pre-existing units by unauthorized individuals. Refrigerant is extremely dangerous and potentially lethal.

**Facts:**

Refrigerant “can cause death without warning”.

Refrigerant is considered a gateway drug because users often progress from refrigerant use to drug and alcohol abuse.

Refrigerant is not a cumulative substance where chances of dying from it increase as the dosage and number of use increases. It can kill on the 1<sup>st</sup>, 10<sup>th</sup>, 100<sup>th</sup>, or any other time. 33 percent of deaths resulting from refrigerant huffing occurred on the 1<sup>st</sup> use.

Refrigerant, like other poisons, must be kept out of reach of children.

Refrigerant theft is increasing.

According to Mike Opitz, Certification Manager, LEED for Existing Buildings, U.S. Green Building Council, chlorine in CFCs and HCFCs destroy the ozone and depletes the Earth's natural shield for incoming ultraviolet radiation and absorb outgoing infrared radiation from the earth, functioning as potent greenhouse gases.

**National Statistics:**

The National Institute on Drug Abuse reports that one in five American teens have used Inhalants to get high.

According to Stephen J. Pasierb, President and CEO of The Partnership for Drug-Free America, 22% of 6th and 8th graders admitted abusing inhalants and only 3% of parents think their child has ever abused inhalants.

An analysis of 144 Texas death certificates by the Texas Commission on Alcohol and Drug Abuse involving misuse of inhalants found that the most frequently mentioned inhalant (35%) was Freon (51 deaths). Of the Freon deaths, 42 percent were students or youth with a mean age of 16.4 years.

Suffocation, inhaling fluid or vomit into the lungs, and accidents each cause about 15% of deaths linked to inhalant abuse.

National Institute on Drug Abuse's 'Monitoring the Future' study reveals that inhalant abuse among 8th graders is up 7.7% since 2002.

55% of deaths linked to inhalant abuse are caused by “Sudden Sniffing Death Syndrome.” SSDS can occur on the first use or any use. The

Inhalant causes the heart to beat rapidly and erratically, resulting in cardiac arrest.

22% of inhalant abusers who died of SSDS had no history of previous inhalant abuse. In other words, they were first-time users.

**Collier County, FL Statistics:**

The use of inhalants in middle schools has doubled in two years

The average age a child starts using drugs or alcohol is just 12½

Every third day a child is taken to the hospital because of a drug overdose

85 percent of all juvenile criminal cases are substance related

Deaths due solely to drug toxicity increased 76% between 1998 and 2005

The modification of this code will have an immense positive impact on the safety and health of our citizens, especially our youth. It will reduce the number of deaths associated with Inhalant abuse and the number of injuries associated with Freon accidents and leaks.

**Cost Impact:** The code change proposal will increase the cost of construction by \$20-\$25.

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### Public Hearing Results

**PART II - IRC**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed text is retro-active and unenforceable. The IPMC is the more appropriate place for such text.

**Assembly Action:**

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**None**

## **Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

### *Public Comment 1:*

**Mona Casey representing United Parents to Restrict Open Access to Refrigerant, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

#### **PART II – IRC MECHANICAL**

**M1411.6.1 Existing HVAC systems.** Existing Air conditioning units with refrigerant circuit access ports that are located outdoors shall be retrofitted provided with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access whenever the refrigerant system is modified recharged, serviced, or repaired.

**Commenter's Reason:** At the previous code hearing, proposal PM14-09/10, which provides a trigger for securing existing refrigerant circuit access ports located outdoors, was approved by the Property Maintenance Committee. Because the IPMC has yet to be adopted by all states, it is important to add this provision to the IMC and IRC as well to ensure a broader adoption of the code. This proposed modification will standardize the language across all three codes.

### *Public Comment 2:*

**Julius Ballanco, PE, JB Engineering and Code Consulting PC, representing self, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

#### **PART II – IRC MECHANICAL**

**M1411.6.1 Existing HVAC systems.** Existing Air conditioning units with refrigerant circuit access ports that are located outdoors shall be retrofitted provided with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access whenever the refrigerant system is modified recharged, serviced, or repaired.

**Commenter's Reason:** The reason provided by the Mechanical Committee is not an appropriate comment. Service personnel are liable for everything they do when servicing equipment. This is merely one additional requirement. The other justification was that the change conflicts with Section 102.2. In fact, this proposal is consistent with Section 102.2.

This section does not apply to existing equipment. The section clearly establishes that the requirement is applicable when the system is recharged, serviced, or repaired. The system is the refrigerant circuit. Such a change is consistent with Section 102.4.

Another point discussed by both Committees was that the section is unenforceable. There are many sections of the code that are unenforceable. That doesn't mean that the code ignores those requirements. Just because a permit is not required does not mean that the installing contractor does not have to comply with the code. Case in point is any minor change to any building system. A permit is not required, but the change must be in accordance with the code.

What both Committees should have been focusing on is whether this section is necessary for the protection of health and safety. That has been answered previously with a big yes. Therefore, the change to the Mechanical Code and Residential Code should have been accepted. This is an inexpensive change that can save lives.

### *Public Comment 3:*

**Adam Deschamp representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

#### **PART II-IRC MECHANICAL**

**M1411.6.1 Securing refrigerant access ports.** Air conditioning units with a refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A member of my friends' family died and others have died from how easy it is to access those parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.



*Public Comment 4:*

**Laura Pestano representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART II-IRC MECHANICAL**

**M1411.6.1 Securing refrigerant access ports.** Air conditioning units with a refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 5:*

**Russell Phillips representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART II-IRC MECHANICAL**

**M1411.6.1 Securing refrigerant access ports.** Air conditioning units with a refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 6:*

**Dana Prothro representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART II-IRC MECHANICAL**

**M1411.6.1 Securing refrigerant access ports.** Air conditioning units with a refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** My daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

*Public Comment 7:*

**Philippe Albert Schaedler representing Dana Prothro, requests Approval as Modified by this Public Comment.**

Replace the proposal as follows:

**PART II-IRC-MECHANICAL**

**M1411.6.1 Securing refrigerant access ports.** Air conditioning units with a refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

Public Comment 8:

Michele Wagner representing UPROAR/Dana Prothro, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

PART II-IRC MECHANICAL

**M1411.6.1 Securing refrigerant access ports.** Air conditioning units with a refrigerant circuit access ports located outdoors shall be provided with locking-type tamper resistant caps or shall be otherwise secured to prevent unauthorized access whenever the system is recharged, serviced, or repaired.

**Commenter's Reason:** A friends' daughter died because of access to the parts. The request was sent to protect people and teens from accessing it, because they huff the refrigerant to get high.

Final Action: AS AM AMPC\_\_\_\_\_ D

**M134-09/10**  
**Table 1103.1**

**Proposed Change as Submitted**

**Proponent:** Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Revise table as follows:

[F] TABLE 1103.1  
REFRIGERANT CLASSIFICATION, Amount and OEL

Chemical Refrigerant	Formula	Chemical Name of Blend	Refrigerant Classification	Degrees of Hazard <sup>a</sup>	[M] Amount Of Refrigerant Per Occupied Space			
					Pound per 1,000 cubic feet	ppm	g/m <sup>3</sup>	OEL <sup>e</sup>
R-E170	CH <sub>3</sub> OCH <sub>3</sub>	<u>methoxymethane (dimethyl ether)</u>	A3		1	8,500	16	1,000
R-403A	zeotrope	R-290/22/218 (5/75/20)	A1 <u>A2</u>	2-0-0	7.6	33,000	120	1,000
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3		<u>0.51</u>	<u>4,500</u>	<u>8.1</u>	<u>950</u>
R-433C	zeotrope	R-1270/290 (25.0/75.0)	A3		<u>0.41</u>	<u>3,600</u>	<u>6.6</u>	<u>790</u>
R-438A	zeotrope	R- <u>32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)</u>	A1		<u>4.9</u>	<u>19,000</u>	<u>79</u>	<u>990</u>
R-600a	CH(CH <sub>3</sub> ) <sub>2</sub> -CH <sub>3</sub>	<u>isobutane (2-methyl propane) 2-methyl propane (isobutane)</u>	A3	2-4-0	0.6	4,000	9.6	1,000
R-601a	(CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> CH <sub>3</sub>	<u>2-methylbutane (isopentane)</u>	A3		0.2	1,000	2.9	600

(Portions of table and notes not shown remain unchanged)

**Reason:** R-433B, R-433C, R-438A were recently added to ASHRAE Standard 34.

The classification of R-403A has been changed from A1 to A2 based on data developed as part of an ASHRAE research project using the current method of measuring the LFL of refrigerants.

The chemical names of R-E170, R-600a and R-601a have been changed to be consistent with IUPAC rules for naming organic compounds. The common names are listed in parenthesis.

If approved for publication by ASHRAE prior to the code hearings, a floor modification will be brought forward to add R-1234yf to this table.

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

Public Hearing: Committee: AS AM D  
Assembly: ASF AMF DF

ICCFILENAME: FERGUSON-M-2-T. 1103.1

## Public Hearing Results

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason. The proposed revisions update the table based on the chemicals being used today.

**Assembly Action:**

**None**

### Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Steve Ferguson representing American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

[F]TABLE 1103.1  
REFRIGERANT CLASSIFICATION, Amount and OEL

Chemical Refrigerant	Formula	Chemical Name of Blend	Refrigerant Classification	Degrees of Hazard <sup>a</sup>	[M] Amount Of Refrigerant Per Occupied Space			
					Pound per 1,000 cubic feet	ppm	g/m <sup>3</sup>	OEL <sup>e</sup>
R-E170	CH <sub>3</sub> OCH <sub>3</sub>	methoxymethane (dimethyl ether)	A3		1	8,500	16	1,000
R-403A	zeotrope	R-290/22/218 (5/75/20)	A2	2-0-0	7.6	33,000	120	1,000
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3		0.51	4,500	8.1	950
R-433C	zeotrope	R-1270/290 (25.0/75.0)	A3		0.41	3,600	6.6	790
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1		4.9	19,000	79	990
R-600a	CH(CH <sub>3</sub> ) <sub>2</sub> -CH <sub>3</sub>	2-methyl propane (isobutane)	A3	2-4-0	0.6	4,000	9.6	1,000
R-601	CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>	pentane	A3		0.2	1,000	2.9	600
R-601a	(CH <sub>3</sub> ) <sub>2</sub> CHCH <sub>2</sub> CH <sub>3</sub>	2-methylbutane (isopentane)	A3		0.2	1,000	2.9	600
R-1234yf	CF <sub>3</sub> CF=CH <sub>2</sub>	2,3,3,3-tetrafluoro-1 propene	A2		4.7	16,000	75	500

*(Portions of table not shown remain unchanged)*

**Commenter's Reason:** This proposal adds two new refrigerants (R-601 and R-1234yf) which have recently been published as part of ASHRAE Standard 34. This makes Table 1103.1 consistent with all published refrigerants in ASHRAE Standard 34.

Final Action:

AS

AM

AMPC \_\_\_\_\_

D

# M135-09/10

1105.6, 1105.6.3 (New), 1105.6.3.1, 1105.6.3.2

## Proposed Change as Submitted

**Proponent:** Jeffrey M. Shapiro, PE, International Code Consultants, representing the International Institute of Ammonia Refrigeration

### 1. Revise as follows:

**1105.6 Ventilation.** Machinery rooms shall be mechanically ventilated to the outdoors. ~~Mechanical ventilation shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions. Multiple fans or multispeed fans shall be allowed in order to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.~~

**Exception:** Where a refrigerating system is located outdoors more than 20 feet (6096 mm) from any building opening and is enclosed by a penthouse, lean-to or other open structure, natural or mechanical ventilation shall be provided. Location of the openings shall be based on the relative density of the refrigerant to air. The free-aperture cross section for the ventilation of the *machinery room* shall be not less than:

$$F = \sqrt{G}$$

(Equation 11-1)

For SI:

$$F = 0.138 \sqrt{G}$$

where:

F = The free opening area in square feet (m<sup>2</sup>).

G = The mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

### 2. Add new text as follows:

**1105.6.3 Ventilation rate.** For other than ammonia systems, the mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. The minimum required ventilation rate for ammonia shall be in accordance with IAR 2.

Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

### 3. Revise as follows:

**4405.6.3 1105.6.3.1 Quantity—normal ventilation.** During occupied conditions, the mechanical ventilation system shall exhaust the larger of the following:

1. Not less than 0.5 cfm per square foot (0.0025 m<sup>3</sup>/s·m<sup>2</sup>) of *machinery room* area or 20 cfm (0.009 m<sup>3</sup>/s) per person; or
2. A volume required to limit the room temperature rise to 18°F (10°C) taking into account the ambient heating effect of all machinery in the room.

**4405.6.4 1105.6.3.2 Quantity—emergency conditions.** Upon actuation of the refrigerant detector required in Section 1105.3, the mechanical ventilation system shall *exhaust air* from the *machinery room* in the following quantity:

$$Q = 100 \times \sqrt{G}$$

(Equation 11-2)

For SI:  $Q = 0.07 \times \sqrt{G}$

Where:

Q = The airflow in cubic feet per minute (m<sup>3</sup>/s).

G = The design mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

**Reason:** The proposed change will defer the required ventilation rate for ammonia refrigeration machinery rooms to IIAR2, which is the ANSI accredited industry standard. IIAR 2 is in the process of being revised to change the basis of calculating required ventilation to an "air changes per minute/hour" basis. There is general agreement in the industry that the minimum ventilation rate for ammonia needs to be greater than the rate calculated using the current formula, and IIAR 2 is out for public comment so that a consensus rate that is unique based on the properties of ammonia can be established. It is anticipated that the public comment period for IIAR 2 will close prior to the ICC hearing in Baltimore, and additional information on the new calculation approach will be presented at that time to support this proposal.

As part of this change, requirements related to the required ventilation rate in Section 1105.6 have been moved to Section 1105.6.3 to create a single subsection on this topic rather than the current approach of splitting related requirements between two sections. This improves the usability of the code.

**Cost Impact:** Larger fans to be required by IIAR 2 will slightly increase the cost of construction.

ICCFILENAME: SHAPIRO-M-1-1105.6

## Public Hearing Results

Modify the proposal as follows:

1. Revise as follows:

**1105.6 Ventilation.** Machinery rooms shall be mechanically ventilated to the outdoors.

**Exception:** Where a refrigerating system is located outdoors more than 20 feet (6096 mm) from any building opening and is enclosed by a penthouse, lean-to or other open structure, natural or mechanical ventilation shall be provided. Location of the openings shall be based on the relative density of the refrigerant to air. The free-aperture cross section for the ventilation of the *machinery room* shall be not less than:

$$F = \sqrt{G}$$

(Equation 11-1)

For SI:

$$F = 0.138 \sqrt{G}$$

where:

F = The free opening area in square feet (m<sup>2</sup>).

G = The mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

2. Add new text as follows:

**1105.6.3 Ventilation rate.** ~~For other than ammonia systems,~~ The mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. ~~The minimum required ventilation rate for ammonia shall be in accordance with IIAR 2.~~

Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

3. Revise as follows:

**1105.6.3.1 Quantity—normal ventilation.** During occupied conditions, the mechanical ventilation system shall exhaust the larger of the following:

1. Not less than 0.5 cfm per square foot (0.0025 m<sup>3</sup>/s·m<sup>2</sup>) of *machinery room* area or 20 cfm (0.009 m<sup>3</sup>/s) per person; or
2. A volume required to limit the room temperature rise to 18°F (10°C) taking into account the ambient heating effect of all machinery in the room.

**1105.6.3.2 Quantity—emergency conditions.** Upon actuation of the refrigerant detector required in Section 1105.3, the mechanical ventilation system shall *exhaust air* from the *machinery room* in the following quantity:

$$Q = 100 \times \sqrt{G}$$

(Equation 11-2)

For SI:  $Q = 0.07 \times \sqrt{G}$

Where:

Q = The airflow in cubic feet per minute (m<sup>3</sup>/s).

G = The design mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

**Committee Action:**

**Approved as Modified**

**Committee Reason:** The proposed revision consolidates text into one section to improve usability. The modification deletes references to ammonia and IAR2 because the revised version of the standard is yet to be completed.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Jeffrey Shapiro, International Code Consultants, representing International Institute of Ammonia Refrigeration, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**1105.6.3 Ventilation rate.** For other than ammonia systems, the mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. The minimum required ventilation rate for ammonia shall be 30 air changes per hour, in accordance with IAR 2.

**Commenter's Reason:** The proposed change will correlate the required ventilation rate for ammonia refrigeration machinery rooms with IAR2, which is the ANSI accredited industry standard. IAR 2 is in the process of being revised to change the basis of calculating required ventilation to an "air changes per minute/hour" basis. There is general agreement in the industry that the minimum ventilation rate for ammonia needs to be increased above the rate required for other refrigerants. Those other refrigerants will still be ventilated using a rate calculated by the current formula.

IAR 2 is currently out for public comment so that a consensus rate that is unique based on the properties of ammonia can be established. It is anticipated that the public comment period for IAR 2 will close prior to the ICC hearing in Dallas, and additional information on the background and technical basis for the new calculation approach will be presented at that time to support this proposal.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D

**M136-09/10**

**[F] 1105.8.1 (New), [F] 1105.8.2 (New), [F] 1105.8.3 (New), [F] 1105.8.4 (New)**

**Proposed Change as Submitted**

**Proponent:** Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

**Add new text as follows:**

**[F] 1105.8.1 Ammonia refrigerant.** Systems containing ammonia refrigerant shall discharge vapor to the atmosphere through an approved treatment system in accordance with Section 1105.8.2, a flaring system in accordance with Section 1105.8.3 or through an approved ammonia diffusion system in accordance with Section 1105.8.4, or by other approved means.

**Exceptions:**

1. Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.
2. Where the fire code official determines, on review of an engineering analysis prepared in accordance with Section 104.7.2 of the *International Fire Code*, that a fire, health or environmental hazard would not result from discharging ammonia directly to the atmosphere.

**[F] 1105.8.2 Treatment systems.** Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with Chapter 37 of the *International Fire Code*

**[F] 1105.8.3 Flaring systems.** Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards.

Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback, and shall not expose structures or materials to threat of fire. Standby fuel, such as LP gas, and standby power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system.

**[F] 1105.8.4 Ammonia diffusion systems.** Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (4 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but not lower than 33 feet (10 058 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.

**Reason:** This is an effort to make Chapter 11 a little more complete. This language is extracted from The Fire Code. There have been complaints that the I-codes in general refer to too many standards requiring many different documents to accomplish one thing. Some of the complaints have merit. The reference to ASHRAE-15 is left in tact but the Fire Code requirements satisfy the issue. Why not just say what is required for ammonia discharge rather than referring to the standard or the Fire Code. This will aid in plan review as well as field inspection because the requirements will be right there in the chapter.

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

ICCFILENAME: MCMANN-M-7-1105.8

## **Public Hearing Results**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proponent asked for disapproval to allow the proposal to be reworked and resubmitted as a public comment. The provisions for the discharge of pressure relief valves are lacking.

**Assembly Action:**

**None**

## **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO), requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

**1105.8 7.1 Ammonia discharge.** Pressure relief valves for ~~ammonia~~ refrigeration systems shall discharge in accordance with ASHRAE-15 and Sections 1105.7.1.1 through 1105.7.1.3.3.

**[F] 1105.7.1.1 Flammable refrigerants.** Systems containing flammable refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an approved treatment system in accordance with Section 1105.7.1.3.1. Systems containing flammable refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is 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.

**[F] 1105.7.1.2 Toxic and highly toxic refrigerants.** Systems containing toxic or highly toxic refrigerants shall discharge vapor to the atmosphere only through an approved treatment system in accordance with Section 1105.7.1.3.1 or a flaring system in accordance with Section 1105.7.1.3.2.

**[F] 1105.8.4 7.1.3 Ammonia refrigerant.** Systems containing ammonia refrigerant shall discharge vapor to the atmosphere through an approved treatment system in accordance with Section 1105.8.2.4 7.1.3.1 a flaring system in accordance with Section 1105.8.3 7.1.3.2 or through an approved ammonia diffusion system in accordance with Section ~~1105.8.4~~ 7.1.3.3, or by other approved means.

**Exceptions:**

1. Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.
2. When the fire code official determines, on review of an engineering analysis prepared in accordance with Section 104.7.2, that a fire, health or environmental hazard would not result from discharging ammonia directly to the atmosphere.

**[F] 1105.8.2 7.1.3.1 Treatment systems.** Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with Chapter 37 of the *International Fire Code*

[F] **1105.8.3 7.1.3.2 Flaring systems.** Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback, and shall not expose structures or materials to threat of fire. Standby fuel, such as LP gas, and standby power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system.

[F] **1105.8.4 7.1.3.3 Ammonia diffusion systems.** Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (4 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but no lower than 33 feet (10 058 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.

**Commenter's Reason:** We recommended disapproval because the text was parked under the wrong section and the balance of the Fire Code section was extracted to complete the section. Inspectors need this information in the code to verify that relief devices are terminated appropriately.

Final Action: AS AM AMPC\_\_\_\_\_ D

## M139-09/10

### Table 1202.4, 1203.15, 1203.15.1, 1203.15.2, 1203.15.3, 1208.1, 1208.1.1, 1210 (New), Chapter 15

#### Proposed Change as Submitted

**Proponent:** Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

#### 1. Revise table as follows:

**TABLE 1202.4  
HYDRONIC PIPE**

MATERIAL	STANDARD
Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)	ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693

*(Portions of table not shown are unchanged)*

#### 2. Delete without substitution:

~~**1203.15 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints conforming to Section 1203.15.1, electrofusion joints conforming to Section 1203.15.2, or stab-type insertion joints conforming to Section 1203.15.3.~~

~~**1203.15.1 Heat fusion joints.** Joints shall be of the socket fusion, saddle fusion or butt fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.~~

~~**1203.15.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.~~

~~**1203.15.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.~~



**3. Revise as follows:**

**SECTION 1208  
TESTS**

**1208.1 General.** Hydronic piping systems ~~other than ground source heat pump loop systems~~ shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes. ~~Ground source heat pump loop systems shall be tested in accordance with Section 1208.1.1.~~

**4. Delete without substitution:**

~~**1208.1.1 Ground source heat pump loop systems.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the problem shall be identified and corrected.~~

**5. Add new text as follows:**

**SECTION 1210  
GROUND SOURCE HEAT PUMP LOOP SYSTEMS**

**1210.1 General.** Ground-source heat pump loop systems shall comply with this section.

**1210.2 Piping material.** Ground-source heat pump loop system piping material for water-based systems shall comply with Sections 1210.2.1 through 1210.2.4.

**1210.2.1 Used materials.** Reused piping, fittings, valves, or other materials shall not be used in ground-source heat pump loop systems.

**1210.2.2 Material rating.** Piping shall be rated for the operating temperature and pressure of the ground-source heat pump loop systems. Fittings shall be approved for pressure applications and recommended by the manufacturer for installation with the piping material installed. Materials installed underground shall be suitable for burial.

**1210.2.3 Piping and tubing materials standards.** Ground source heat pump loop system piping shall conform to the standards listed in Table 1210.2.3.

**TABLE 1210.2.3  
GROUND SOURCE HEAT PUMP LOOP SYSTEM PIPING**

<b><u>MATERIAL</u></b>	<b><u>STANDARD</u></b>
Chlorinated polyvinyl chloride (CPVC) plastic pipe	<u>ASTM D 2846; ASTM F 441; ASTM F 442</u>
Cross-linked polyethylene (PEX) tubing	<u>ASTM F 876; ASTM F 877</u>
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	<u>ASTM F 1282; CSA B137.9</u>
Polyethylene (PE) pipe, tubing and fittings	<u>ASTM D 3035; ASTM D 2447; ASTM D 2737; ASTM F 714; AWWA C901; CSA CAN/CSA-B-137.1</u>
Polypropylene (PP-R) pipe, tubing and fittings	<u>ASTM F 2389</u>
Polyvinyl chloride (PVC) plastic pipe	<u>ASTM D 1785; ASTM D 2241</u>
Raised temperature polyethylene (PE-RT)	<u>ASTM F 2623</u>

**1210.2.4 Fittings.** Geothermal pipe fittings shall be approved for installation with the piping materials to be installed, suitable for use underground if buried, and shall conform to the standards listed in Table 1210.2.4.

**TABLE 1210.2.4  
GROUND SOURCE HEAT PUMP LOOP SYSTEM FITTINGS**

<u>PIPE MATERIAL</u>	<u>STANDARD</u>
<u>Chlorinated polyvinyl chloride (CPVC) plastic pipe</u>	<u>ASTM D 2846; ASTM F 437; ASTM F 438; ASTM F 439; CSA B137.6</u>
<u>Cross-linked polyethylene (PEX) tubing</u>	<u>ASTM F 877; ASTM F 1807; ASTM F 1960; ASTM F 2080; ASTM F 2098; ASTM F 2159; ASTM F 2434; CSA B137.5</u>
<u>Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe</u>	<u>ASTM D 3261; ASTM F 877; ASTM F 1807; ASTM F 2098; ASTM F 2159; ASTM F 2434; CSA B137.5, B137.1</u>
<u>Polyethylene (PE) pipe, tubing and fittings</u>	<u>ASTM D 2609; ASTM D 2683; ASTM D 3261; ASTM F 1055; CSA B137.1</u>
<u>Polypropylene (PP-R) pipe, tubing and fittings</u>	<u>ASTM F 2389; CSA B137.11</u>
<u>Polyvinyl chloride (PVC) plastic pipe</u>	<u>ASTM D 2464; ASTM D 2466; ASTM D 2467; CSA B137.2; CSA B137.3</u>
<u>Raised temperature polyethylene (PE-RT)</u>	<u>ASTM D 3261; ASTM F 877; ASTM F 1807; ASTM F 2098; ASTM F 2159; ASTM F 2434; CSA B137.5, B137.1</u>

**1210.3 Joints and connections.** Joints and connections in ground source heat pump loop systems shall be of an approved type and shall comply with Sections 1210.3.1 through 1210.3.9. Joints and connections shall be leak-free for the pressure of the ground source heat pump loop systems. Joints used underground shall be approved for buried applications.

**1210.3.1 Joints between different piping materials.** Joints between different piping materials shall be made with approved transition fittings.

**1210.3.2 Preparation of pipe ends.** Piping shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

**1210.3.3 Joint preparation and installation.** Where required by Sections 1210.3.4 through 1210.3.6, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections 1210.3.3.1 and 1210.3.3.2 as applicable.

**1210.3.3.1 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.

**1210.3.3.2 Thermoplastic-welded joints.** Joint surfaces shall be cleaned by an approved procedure. Joints shall be welded according to the manufacturer's instructions.

**1210.3.4 CPVC plastic pipe.** Joints for CPVC plastic piping and fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

**1210.3.5 Cross-linked polyethylene (PEX) plastic tubing.** Joints for cross-linked polyethylene plastic piping and fittings shall conform to Sections 1210.3.5.1 and 1210.3.5.2. Mechanical joints shall conform to Section 1210.3.3.

**1210.3.5.1 Compression-type fittings.** Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

**1210.3.5.2 Plastic-to-metal connections.** Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PEX pipe.

**1210.3.6 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints for polyethylene plastic piping and fittings for ground source heat pump loop systems shall be heat-fusion joints conforming to Section 1210.3.6.1, electrofusion joints conforming to Section 1210.3.6.2, or stab-type insertion joints conforming to Section 1210.3.6.3.

**1210.3.6.1 Heat-fusion joints.** Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.

**1210.3.6.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.

**1210.3.6.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.

**1210.3.7 Polypropylene (PP) plastic.** Joints for PP plastic piping and fittings shall comply with Sections 1210.3.7 and 1210.3.7.2.

**1210.3.7.1 Heat-fusion joints.** Heat-fusion joints for polypropylene (PP) piping joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt-fusion. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 2389.

**1210.3.7.2 Mechanical and compression sleeve joints.** Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

**1210.3.8 Raised temperature polyethylene (PE-RT) plastic tubing.** Joints for raised temperature polyethylene piping and fittings shall conform to Sections 1210.3.8.1 and 1210.3.8.2. Mechanical joints shall conform to Section 1210.3.3.

**1210.3.8.1 Compression-type fittings.** Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

**1210.3.8.2 PE-RT-to-metal connections.** Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe.

**1210.3.9 PVC plastic pipe.** Joints for PVC plastic pipe and fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

**1210.4 Shutoff valves.** Shutoff valves shall be installed in ground source heat pump loop systems in the locations indicated in Sections 1210.4.1 through 1210.4.6. Pressure relief valves shall be installed in accordance with Section 1210.4.7.

**1210.4.1 Heat exchangers.** Shutoff valves shall be installed on the supply and return side of a heat exchanger.

**Exception:** Shutoff valves shall not be required where heat exchangers are integral with a boiler; or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section 1005.1.

**1210.4.2 Central systems.** Shutoff valves shall be installed on the building supply and return of a central utility system.

**1210.4.3 Pressure vessels.** Shutoff valves shall be installed on the connection to any pressure vessel.

**1210.4.4 Pressure-reducing valves.** Shutoff valves shall be installed on both sides of a pressure-reducing valve.

**1210.4.5 Equipment and appliances.** Shutoff valves shall be installed on connections to mechanical *equipment* and appliances. This requirement does not apply to components of a ground source heat pump loop system such as pumps, air separators, metering devices, and similar *equipment*.

**1210.4.6 Expansion tanks.** Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

**1210.4.7 Reduced pressure.** A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section 1006.

**1210.5 General.** Piping, valves, fittings, and connections shall be installed in accordance with the conditions of approval and Sections 1210.5.1 through 1210.5.10.

**1210.5.1 Protection of potable water.** The potable water system shall be protected from backflow in accordance with the *International Plumbing Code*.

**1210.5.2 Pipe penetrations.** Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with the *International Building Code*.

**1210.5.3 Clearance to combustibles.** Where the exterior temperature of piping in a geothermal piping system exceeds 250°F (121°C), such piping shall have a minimum *clearance* of 1 inch (25 mm) to combustible materials.

**1210.5.4 Contact with building material.** A ground source heat pump loop system shall not be in direct contact with building materials that cause the piping material to degrade or corrode, or that interfere with the operation of the system.

**1210.5.5 Strains and stresses.** Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

**1210.5.6 Flood hazard.** Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the *design flood elevation*.

**1210.5.7 Pipe support.** Pipe shall be supported in accordance with Section 305.

**1210.5.8 Velocities.** Flow velocities in ground source heat pump loop systems shall be designed to not exceed the maximum flow velocity recommended by the pipe and fitting manufacturer and shall be controlled to reduce the possibility of water hammer.

**1210.5.9 Labeling and marking.** Ground source heat pump loop system piping shall be marked with tape, metal tags or other method where it enters a building indicating "GROUND SOURCE HEAT PUMP LOOP SYSTEM". The marking shall indicate any antifreeze used in the system by name and concentration.

**1210.5.10 Chemical compatibility.** Antifreeze and other materials used in a ground source heat pump loop system shall be chemically compatible with the pipe, tubing, fittings, and mechanical systems.

**1210.6 Makeup water.** The transfer fluid used in ground source heat pump loop systems shall be compatible with the makeup water supplied to the system.

**1210.7 Ground source heat pump loop systems tests.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the cause shall be identified and corrective action taken.

**1210.7.1 Pressurizing during installation.** Ground source heat pump loop piping to be embedded in concrete shall be pressure tested prior to pouring concrete. During pouring, the pipe shall be maintained at the proposed operating pressure.

## **6. Add new standards to Chapter 15 as follows:**

### **ASTM**

<u>D 2464-06</u>	<u>Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80</u>
<u>D 2466-06</u>	<u>Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40</u>
<u>D 2467-06</u>	<u>Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80</u>
<u>D 2609-02</u>	<u>Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe</u>
<u>D 2737-03</u>	<u>Standard Specification for Polyethylene (PE) Plastic Tubing</u>
<u>F 437-06</u>	<u>Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80</u>
<u>F 714-08</u>	<u>Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter</u>

- F 1807-08      Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
- F1960-08      Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing
- F 2080-08      Standard Specification for Cold-Expansion Fittings with Metal Compression-Sleeves for Cross-Linked Polyethylene (PEX) Pipe
- F 2098-08      Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings
- F 2159-05      Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
- F 2434-08      Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Crosslinked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing

**AWWA**

- C901-08      Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) through 3 In. (76 mm), for Water Service

**CSA**

- B137.1-02      Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services
- B137.2-02      PVC Injection-moulded Gasketed Fittings for Pressure Applications
- B137.3-02      Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications
- B137.5-02      Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications— with Revisions through September 1992
- B137.6-02      CPVC Pipe, Tubing and Fittings for Hot and Cold Water Distribution Systems— with Revisions through May 1986
- B137.11-02      Polypropylene (PP-R) Pipe and Fittings for Pressure Applications

**Reason:** Water based ground-source heat pump loop PE piping is currently placed in the hydronics section where it doesn't quite fit. This special and growing application should have its own section, and it should cover other materials that could potentially be used. Green building rating systems are strongly promoting ground-source heat pump loop heating and cooling systems, and the code should have more information. I am introducing this proposal to accomplish that and would hope it would act to encourage further development. While HDPE dominates the technology with an expected 95% of the systems, other materials can and are be utilized in water based ground loop systems.

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

**Analysis:** Review of proposed new standard AWWA C901-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. All other standards proposed for inclusion are already referenced standards of the International Plumbing Code (IPC).

ICCFILENAME: CUDAHY-M-1-1202-1210

**Public Hearing Results**

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

**Committee Action:** **Disapproved**

**Committee Reason:** Some of the proposed standards allow alloys that promote dezincification. Some of the referenced standards are not currently in Chapter 15. Copper and other materials need to be added.

**Assembly Action:** **None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Michael Cudahy representing PPFA (Plastic Pipe and Fittings Association), requests Approval as Submitted.**

**Commenter's Reason:** Water based ground-source heat pump loop PE piping is currently placed in the hydronics section where it doesn't quite fit. This special and growing application should have its own section, and it should cover other materials that could potentially be used.

PPFA introduced this proposal to accomplish that and we would hope it would act to encourage further development. While HDPE dominates the technology with an expected 95% of the systems, other materials can and are be utilized in water based ground loop systems.

At the initial hearing this proposal had strong support of many in the audience and on the committee. The comment that "Some of the proposed standards allow alloys that promote dezincification." is not a suitable rational to reject this language.

PPFA would hope that this language be accepted at the FAH and updated as needed to give better guidance on this application. We would not oppose any amendments to add additional materials if suitable for these water based geothermal systems. As with other greenbuilding technologies, the codes are falling behind.

Final Action: AS AM AMPC\_\_\_\_\_ D

## M141-09/10, Part I

### Table 1202.5

**NOTE: PART II DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART II IS REPRODUCED ONLY FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART I.**

### Proposed Change as Submitted

**Proponent:** Andrew Granzow, Viega, LLC

#### PART I – IMC

**Revise table as follows:**

**1202.5 TABLE  
HYDRONIC PIPE FITTINGS**

<b>MATERIAL</b>	<b>STANDARD (see Chapter 15)</b>
Brass	ASTM F 1974
Bronze	ASME B16.24
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29; <u>ASTM F 877 ; ASTM F 1807</u>
Ductile iron and gray iron	ANSI/AWWA C110/A21.10
Ductile iron	ANSI/AWWA C153/A21.53;
Gray iron	ASTM A 126
Malleable iron	ASME B16.3;
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; <u>ASTM F 2159; ASTM F 2389</u>
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28 ASTM A 420

**Reason:** To include nationally recognized standards for piping materials currently being used for hydronic applications.

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

ICCFILENAME: GRANZOW-M-1-T. 1202.5-RM-T. M2101.1

### Public Hearing Results

#### PART I - IMC

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**John Woestman, Kellen Company, representing Copper Development Association, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

**1202.5 TABLE  
HYDRONIC PIPE FITTINGS**

MATERIAL	STANDARD (see Chapter 15)
Brass	ASTM F 1974
Bronze	ASME B16.24
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29; <del>ASTM F 877</del> ; <del>ASTM F 1807</del>
Ductile iron and gray iron	ANSI/AWWA C110/A21.10
Ductile iron	ANSI/AWWA C153/A21.53;
Gray iron	ASTM A 126
Malleable iron	ASME B16.3;
<u>PEX fittings</u>	<del>ASTM F 877</del> ; <del>ASTM F 1807</del> <del>ASTM F 2159</del>
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; <del>ASTM F 2159</del> ; ASTM F 2389
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28 ASTM A 420

**Commenter's Reason:** Fittings for PEX systems commonly are made of combinations of materials (e.g. plastic fittings with copper crimp rings). This proposed modification to M141 creates a row in Table 1202.5 specifically for PEX fittings, and then moves the standards recommended for approval by the committee into that row in the table. Each of these three standards are specific to PEX systems (including fittings), or for fittings used in PEX systems.

**Commenter's Reason:**

Final Action:            AS                    AM                    AMPC \_\_\_\_\_            D

**NOTE: PART II REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE**

**M141-09/10, PART II – IRC MECHANICAL**

Revise table as follows:

**TABLE M2101.1  
HYDRONIC PIPING MATERIALS**

MATERIAL	USE CODE <sup>a</sup>	STANDARD <sup>b</sup>	JOINTS	NOTES
Brass pipe	1	ASTM B 43	Brazed, welded, threaded, mechanical and flanged fittings	
Brass tubing	1	ASTM B 135	Brazed, soldered and mechanical fittings	
Chlorinated poly (vinyl chloride) (CPVC) pipe and tubing	1, 2, 3	ASTM D 2846	Solvent cement joints, compression joints and threaded adapters	
Copper pipe	1	ASTM B 42, B 302	Brazed, soldered and mechanical fittings threaded, welded and flanged	

Copper tubing (type K, L or M)	1, 2	ASTM B 75, B 88, B 251, B 306	Brazed, soldered and flared mechanical fittings	Joints embedded in concrete
Cross-linked polyethylene (PEX)	1, 2, 3	ASTM F 876, F 877	(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 F 1281 or CAN/ CSA B137.10	Mechanical, crimp/insert	Install in accordance with manufacturer's instructions.
PEX Fittings		ASTM F 877 ASTM F 1807 ASTM F 1960 ASTM F 2098 ASTM F 2159	Copper-crimp/insert fittings, cold expansion fittings, stainless steel clamp, insert fittings, <u>plastic-crimp/insert fittings</u>	Install in accordance with manufacturer's instructions
Plastic fittings-PEX		ASTM F 4807		
Polybutylene (PB) pipe and tubing	1, 2, 3	ASTM D 3309	Heat-fusion, crimp/insert and compression	Joints in concrete shall be heat-fused.
Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)	1, 2, 4	ASTM D 2513; ASTM D 3350; ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693	Heat-fusion	
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F 1282 CSA B 137.9	Mechanical, crimp/insert	
Polypropylene (PP)	1, 2, 3	ISO 15874 ASTM F 2389	Heat-fusion joints, mechanical fittings, threaded adapters, compression joints	
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F 2623	Copper crimp/insert fitting stainless steel clamp, insert fittings	
Soldering fluxes	1	ASTM B 813	Copper tube joints	
Steel pipe	1, 2	ASTM A 53, A 106	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 A 254	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.
- b. Standards as listed in Chapter 44.

**Reason: (Row #8-PEX Fittings-ASTM F877)** The added standard reference clearly identifies a nationally recognized standard for PEX fittings and allows installers the option to utilize products under this standard for use in residential PEX hydronic applications.

“ASTM F877 - 07 Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems”

**(Row #8-PEX Fittings-ASTM F2159)** The added standard reference clearly identifies a nationally recognized standard for PEX fittings and allows installers the option to utilize products under this standard for use in residential PEX hydronic applications.



“ASTM F2159 - 05 Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing”

**(Row #9-Plastic Fittings PEX)** The standard identified above makes no reference to plastic fittings and therefore the code reference is not consistent with the intent of the standard. This proposed code change has no impact on the use of product manufactured to this standard as this standard is already referenced in the appropriate section of the table under “PEX fittings”. Below is the title and scope of F1807

**“ASTM F1807 - 08 Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing”**

“1. Scope

1.1 This specification covers metal insert fittings and copper crimp rings for use with cross-linked polyethylene (PEX) tubing in <sup>3</sup>/<sub>8</sub>, <sup>1</sup>/<sub>2</sub>, <sup>5</sup>/<sub>8</sub>, <sup>3</sup>/<sub>4</sub>, and 1 in. and 1 <sup>1</sup>/<sub>4</sub> nominal diameters that meet the requirements for Specifications F 876 and F 877. These fittings are intended for use in 100 psi (689.5 kPa) cold- and hot-water distribution systems operating at temperatures up to, and including, 180°F (82°C). The requirements for materials, workmanship, dimensions, and markings to be used on the fittings and rings are also included.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units which are provided for information only and are not considered the standard.

1.3 Compliance with this specification requires that these fittings be tested and certified to Specification F 877.

1.4 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

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

**PART II - IRC**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval was based on the proponent’s printed reason.

**Assembly Action:**

**None**

**M148-09/10, Part I  
1203.20 (New)**

**Proposed Change as Submitted**

**Proponent:** Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C.

**PART I – IMC**

**Add new text as follows:**

**1203.20 Listed joints and connections.** Joints and connections that are not otherwise addressed in Section 1203 shall be certified by a third party agency as acceptable for hydronic piping systems. The joints and connections shall be installed in accordance with their certification and manufacturer’s installation instructions.

**Reason:** There are various types of joints and connections utilized in water distribution and water supply systems that are not listed in Section 605. However, these joints or connections are listed by a third party agency as being acceptable for water distributions systems. This new section will indicate that such joints and connections are acceptable. Some examples of these types of joints and connections are unions, rolled groove fittings, and cut groove fittings.

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

ICCFILENAME: BALLANCO-M-2-1203.20-M1204.5

**Public Hearing Results**

**PART I - IMC**

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed text is not product specific and is not tied to a specific standard, thus, confusion can result. Current Section 1201.3 allows ASME B31.9 as an option. The text “certified by a third party agency” is unique to the IPC and is not defined in the IMC. The codes should be consistent in referencing an “approved agency.”

**Assembly Action:**

**None**

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing self, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

**1203.20 Listed joints and connections.** Joints and connections that are not otherwise addressed in Section 1203 shall be ~~certified by a third party listed by an approved~~ agency as acceptable for hydronic piping systems. The joints and connections shall be installed in accordance with their listing and manufacturer's installation instructions.

**Commenter's Reason:** The proposed modification is based on the Committee's comment for consistency in language. The modification uses language that is found in Chapter 3 and throughout the Code.

Final Action: AS AM AMPC\_\_\_ D

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**M148-09/10, Part II  
IRC M2104.5 (New)**

**Proposed Change as Submitted**

**Proponent:** Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C.

**PART II – IRC MECHANICAL**

Add new text as follows:

**M2104.5 Listed joints and connections.** Joints and connections that are not otherwise addressed in Section 2104 of the International Mechanical Code shall be certified by a third party agency as acceptable for hydronic piping systems. The joints and connections shall be installed in accordance with their certification and manufacturer's installation instructions.

**Reason:** There are various types of joints and connections utilized in water distribution and water supply systems that are not listed in Section 605. However, these joints or connections are listed by a third party agency as being acceptable for water distributions systems. This new section will indicate that such joints and connections are acceptable. Some examples of these types of joints and connections are unions, rolled groove fittings, and cut groove fittings.

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

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**Public Hearing Results**

**PART II - IRC**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval was based on the proponent's printed reason.

**Assembly Action:**

**Disapproved**

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**Individual Consideration Agenda**

**This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. Note that the assembly action, Disapproved, will be the initial motion on the floor for consideration when this item is called.**

Final Action: AS AM AMPC\_\_\_ D

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# M149-09/10

## Table 1302.3, Chapter 15

### Proposed Change as Submitted

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

**1. Revise table as follows:**

**TABLE 1302.3  
FUEL OIL PIPING**

<b>PIPE OR TUBING TYPE MATERIAL</b>	<b>STANDARD (see Chapter 15)</b>
Brass pipe	ASTM B43
Brass tubing	ASTM B135
Copper or copper-alloy pipe	ASTM B42; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280
<del>Labeled</del> Nonmetallic pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D2996
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254; ASTM A539
<u>Metallic Underground Fuel Pipe</u>	<u>UL 971A</u>
<u>Nonmetallic Underground Fuel Pipe</u>	<u>UL 971</u>

**2. Add new standards to Chapter 15 as follows:**

**UL**

971-95 Nonmetallic Underground Piping For Flammable Liquids – with revisions through March 2006

971A-06 Outline of Investigation for Metallic Underground Fuel Pipe

**Reason:** This proposal accomplishes the following:

1. The first column of the table is not material, but specific pipe and tubing types.
2. The reference to "Labeled pipe" requirements in the table applies to 'Nonmetallic pipe', the title of section 1302.4.
3. ASTM D2996 is limited to only FRP pipe, so it does not reflect other forms of 'nonmetallic pipes' used in fuel applications today. In addition this standard does not contain any physical assembly, use/misuse tests or fuel compatibility tests, such as those found in UL971, which would make it suitable for use in fuel oil piping applications.
4. ASTM A539 was withdrawn without replacement in 1999.
5. *The proposed new standard (UL 971) for nonmetallic underground fuel pipe and the Outline of Investigation (UL 971A) for metallic underground fuel pipe include a comprehensive set of construction and performance requirements, including tests to address physical abuse and misuse, and long-term compatibility with fuels and fluids.*

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

**Analysis:** Review of proposed new standards, UL 971-95 and UL 971A-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-31-T. 1302.3-CH 15

### Public Hearing Results

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standards did not comply with ICC standards criteria, Section 3.6.3.2.

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

## Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:*

**Jonathan Humble (Chairman) representing ICC Reference Standards Committee, requests Approval as Modified by this Public Comment.**

Modify the proposal as follows:

**TABLE 1302.3  
FUEL OIL PIPING**

PIPE OR TUBING TYPE	STANDARD (see Chapter 15)
Brass pipe	ASTM B43
Brass tubing	ASTM B135
Copper or copper-alloy pipe	ASTM B42; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280
Nonmetallic pipe	(See Section 1302.4)
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254
Metallic Underground Fuel Pipe	UL 971A
Nonmetallic Underground Fuel Pipe	UL 971

**UL**  
971-95      Nonmetallic Underground Piping For Flammable Liquids — with revisions through March 2006  
971A-06      Outline of Investigation for Metallic Underground Fuel Pipe

**Commenter's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process.

We therefore propose to have deleted the reference standards and subsequent reference to those standards as part of this proposal to modify the original proposal.

Final Action:                      AS                      AM                      AMPC \_\_\_\_\_                      D

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### **M150-09/10** **1302.4, Chapter 15**

#### Proposed Change as Submitted

**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.

**1. Revise as follows:**

**1302.4 Nonmetallic pipe.** All nonmetallic pipe and connectors shall be *listed and labeled* as being acceptable for the intended application for flammable and combustible liquids. Nonmetallic pipe shall be installed only ~~outside~~ indoors, underground.

**Exception:** Nonmetallic flexible connectors listed and labeled for aboveground use in accordance with UL 2039 shall be permitted to be installed aboveground.

**2. Add new standard to Chapter 15 as follows:**

**UL**  
2039-02      Outline of Investigation for Flexible Connectors for Flammable Liquids

**Reason:** This proposal clarifies that both nonmetallic pipe and connectors need to be listed and labeled. In addition it allows flexible nonmetallic connectors listed in accordance with UL 2039 to be installed aboveground.

The Subject 2039 Outline of Investigation includes a comprehensive set of performance requirements for evaluating metallic and nonmetallic connectors for aboveground and underground transfer of noncorrosive, stable, flammable and combustible liquids. The connectors have a maximum length of eight feet.

Connectors listed in accordance with 2039 are fabricated, inspected, and tested for leakage before shipment from the factory as completely assembled vessels.

The intended use of these connectors is for the transfer of flammable and combustible liquids in, among other applications, underground carrier piping to a dispenser, carrier piping in an open dispenser sump to a dispenser, carrier piping in an open tank sump to a tank pump, and aboveground carrier piping to an aboveground tank.

Six companies currently have listings for these products.

In the second sentence, the intent is "outdoors" and the word "outside" does not necessarily mean outdoors.

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

**Analysis:** Review of proposed new standard UL 22039-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

ICCFILENAME: EUGENE-M-32-1302.4-CH 15

### **Public Hearing Results**

**Note:** The following analysis was not in the Code Change monograph but was published on the ICC website at <http://www.iccsafe.org/cs/codes/Documents/2009-10cycle/ProposedChanges/Standards-Analysis.pdf> :

**Analysis:** Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section 3.6.3.2.

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** Approval is based upon the proponent's printed reason.

**Assembly Action:**

**None**

### **Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Jonathan Humble (Chairman) representing ICC Reference Standards Committee, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

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

**Exception:** Nonmetallic flexible connectors listed and labeled for aboveground use in accordance with UL 2039 shall be permitted to be installed aboveground.

**UL 2039-02** ~~Outline of Investigation for Flexible Connectors for Flammable Liquids~~

**Commenter's Reason:** The ICC Reference Standards Committee is a committee that was organized "to support the codes development committees through the review of reference standards for the International Codes." We submit this code challenge to provide an opinion regarding code change.

It is the reference standards committee's view that the proposal currently lacks sufficient information concerning the promulgation process. We would preface this opinion that it is not our view to state that the proposed document is technically deficient or that the proposal does not have technical merit, but rather to state that the document development process and maintenance process do not comply with ICC Council Policy 28, specifically Section 3.6.3, which requires standards be promulgated according to a consensus process.

We therefore propose to have deleted the reference standard and subsequent reference to that standard as part of this proposal to modify the original proposal.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D

# M156-09/10, Part I

## 401.2

### Proposed Change as Submitted

**Proponent:** Mike Moore, Newport Ventures, representing Broan NuTone

#### **PART I –IMC**

#### **Revise as follows:**

**401.2 Ventilation required.** Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 33.5 psf (50 Pa) in accordance with Section 402.4.2.1 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

**Reason:** Everyone can agree that when dwelling units become “too” tight, they need mechanical ventilation. The question is, “how tight is too tight?” This code change proposal offers five air changes per hour at 50 Pascal as the “too tight” limit, and directs builders to provide mechanical ventilation at this point.

#### *Why is whole-house mechanical ventilation needed?*

Indoor air quality has direct impact on the health of building occupants. Poor indoor air quality is listed by the EPA as being the fourth largest environmental threat to our country.<sup>1</sup> A 2007 California study revealed formaldehyde exposure in most new homes is beyond limits recommended by the California Air Resources Board. Multiple studies have shown that relying on window operation to provide ventilation is not sufficient in practice.<sup>2,3</sup> If unchecked, pollutants from cleaning chemicals, finishes, furniture, and occupant activities can cause serious health effects on building occupants. Whole-house mechanical ventilation reduces occupant exposure to such pollutants.

#### *Why 5 ACH 50?*

Traditionally, 0.35 natural air changes per hour has been the consensus ventilation rate at which it is believed that sufficient fresh air is being provided to building occupants. This ventilation rate was typically achieved without mechanical ventilation because homes were built without an effective air barrier. As building practices have improved, homes have become tighter, and as homes become tighter, mechanical ventilation must be introduced to provide sufficient levels of ventilation.

ASHRAE Standard 136 was developed to enable calculation of natural air changes per hour as a function of air changes at various pressures. By following the calculation procedures in this standard, it can be shown that a natural infiltration rate of 0.35 air changes per hour is equivalent to somewhere between 7 ACH 50 to 10 ACH 50, depending on the local climatic conditions of the home. Because most dwellings are built this tight, ASHRAE 62.2 requires mechanical ventilation for all homes, with few exceptions. However, based on ASHRAE 136, a conservative code might prescribe whole-house mechanical ventilation for any home with an infiltration leakage rate of 10 ACH 50 or less.

As a second point of reference, California’s 2005 Title 24 Chapter 6 requires that, “Continuous mechanical ventilation (either exhaust or supply ventilation) must be installed when the target SLA is below 3.0”. California’s SLA of 3.0 is roughly equivalent to 6 ACH 50. As a third point of reference, NAHB’s National Green Building Standard requires whole-house mechanical ventilation when the infiltration rate falls below 5.0 ACH 50. This requirement provides clear recognition from a consensus standard that whole-house mechanical ventilation should be provided for all homes that meet this threshold.

Based on the previous references, there is broad consensus across states and within consensus standards that whole-house mechanical ventilation should be required when a dwelling’s infiltration falls below 5.0 ACH 50.

#### *What states are now requiring whole-house mechanical ventilation?*

Several states now require mechanical ventilation in dwellings, including MN, VT, WA, CA, and ME.

#### **References:**

1. ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*.  
<http://www.ashrae.org/technology/page/548>
2. Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620  
<http://epb.lbl.gov/Publications/lbnl-59620.pdf>
3. Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in IAQ 2007, *Healthy and Sustainable Buildings*. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); <http://www.iee-sf.com/pdf/SummerFieldResults.pdf>

**Cost Impact:** Where homes have infiltration rates less than 5.0 ACH 50, and those homes are not already providing whole-house mechanical ventilation, the cost of construction will increase.

ICCFILENAME:MOORE-M1-401.2

## Public Hearing Results

### PART I - IMC

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** The tightening of the thermal envelope necessitates mechanical ventilation in some cases. The proposal does not require that a blower door test be conducted, but rather, acts on the results of any such test that is conducted by choice. If Section 403 is applied by choice, no testing is required.

**Assembly Action:**

**None**

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### Individual Consideration Agenda

**This item is on the agenda for individual consideration because public comments were submitted.**

#### *Public Comment 1:*

**Mike Moore, Newport Ventures, representing Broan NuTone, requests Approval as Modified by this Public Comment.**

**Modify the proposal as follows:**

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of ~~33.5 psf~~ 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.2.1 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

**Commenter's Reason:** This proposed modification is essentially editorial, in that it corrects the English units of pressure that are equivalent to 50 Pa. Parts II and III of this proposal were approved by the IBC and IRC committees with this modification.

#### *Public Comment 2:*

**Craig Conner, Building Quality, representing self, requests Disapproval.**

**Commenter's Reason:** M156 Parts I and II specify a residential air-tightness test for application to commercial buildings. M156 Parts I and II do not actually require the test even be done. M156 applies only to the dwelling units in commercial buildings, a very limited subset of the commercial buildings.

Any commercial ventilation requirement should be based on air-tightness or ventilation requirements for commercial buildings (IECC Chapter 5, IBC Section 1203, or IMC Chapter 4 or Section 505).

M156 Parts I and II are inconsistent with EC147, which was approved at the first hearing. EC147 includes commercial air-tightness requirement and criteria.

M156 Part III applies to residential (IRC). M165 Part III will be unworkable as written. Based on the approved EC13 residential buildings will be allowed to test the air-tightness of a sample of homes produced by one builder, rather than all homes (presuming the approved EC13 stands). Many jurisdictions many test only a minority of the residences produced by a specific builder. However the lack of testing will make that section of code unusable.

A better way to exempt less air tight residences from the ventilation requirements is to make the exemption apply only houses tested and shown to have higher air-change rate. (Most residences will require ventilation.) Untested residences would require ventilation. EC13 references the ventilation requirements in IRC M1507. A ventilation exception based on a test is integrated into my comment on RM17 in IRC section M1507.

Final Action:

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# M156-09/10, Part II

## 1203.1

### Proposed Change as Submitted

**Proponent:** Mike Moore, Newport Ventures, representing Broan NuTone

#### PART II – IBC

#### Revise as follows:

**1203.1 General.** Buildings shall be ventilated with natural ventilation in accordance Section 1203.4, or mechanical ventilation in accordance with the International Mechanical Code.

Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 33.5 psf (50 Pa) in accordance with Section 402.4.2.1 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403 of the International Mechanical Code.

**Reason:** Everyone can agree that when dwelling units become “too” tight, they need mechanical ventilation. The question is, “how tight is too tight?” This code change proposal offers five air changes per hour at 50 Pascal as the “too tight” limit, and directs builders to provide mechanical ventilation at this point.

#### *Why is whole-house mechanical ventilation needed?*

Indoor air quality has direct impact on the health of building occupants. Poor indoor air quality is listed by the EPA as being the fourth largest environmental threat to our country.<sup>1</sup> A 2007 California study revealed formaldehyde exposure in most new homes is beyond limits recommended by the California Air Resources Board. Multiple studies have shown that relying on window operation to provide ventilation is not sufficient in practice.<sup>2,3</sup> If unchecked, pollutants from cleaning chemicals, finishes, furniture, and occupant activities can cause serious health effects on building occupants. Whole-house mechanical ventilation reduces occupant exposure to such pollutants.

#### *Why 5 ACH 50?*

Traditionally, 0.35 natural air changes per hour has been the consensus ventilation rate at which it is believed that sufficient fresh air is being provided to building occupants. This ventilation rate was typically achieved without mechanical ventilation because homes were built without an effective air barrier. As building practices have improved, homes have become tighter, and as homes become tighter, mechanical ventilation must be introduced to provide sufficient levels of ventilation.

ASHRAE Standard 136 was developed to enable calculation of natural air changes per hour as a function of air changes at various pressures. By following the calculation procedures in this standard, it can be shown that a natural infiltration rate of 0.35 air changes per hour is equivalent to somewhere between 7 ACH 50 to 10 ACH 50, depending on the local climatic conditions of the home. Because most dwellings are built this tight, ASHRAE 62.2 requires mechanical ventilation for all homes, with few exceptions. However, based on ASHRAE 136, a conservative code might prescribe whole-house mechanical ventilation for any home with an infiltration leakage rate of 10 ACH 50 or less.

As a second point of reference, California’s 2005 Title 24 Chapter 6 requires that, “Continuous mechanical ventilation (either exhaust or supply ventilation) must be installed when the target SLA is below 3.0”. California’s SLA of 3.0 is roughly equivalent to 6 ACH 50. As a third point of reference, NAHB’s National Green Building Standard requires whole-house mechanical ventilation when the infiltration rate falls below 5.0 ACH 50. This requirement provides clear recognition from a consensus standard that whole-house mechanical ventilation should be provided for all homes that meet this threshold.

Based on the previous references, there is broad consensus across states and within consensus standards that whole-house mechanical ventilation should be required when a dwelling’s infiltration falls below 5.0 ACH 50.

#### *What states are now requiring whole-house mechanical ventilation?*

Several states now require mechanical ventilation in dwellings, including MN, VT, WA, CA, and ME.

#### References:

1. ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*.  
<http://www.ashrae.org/technology/page/548>
2. Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620  
<http://epb.lbl.gov/Publications/lbnl-59620.pdf>
3. Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in IAQ 2007, Healthy and Sustainable Buildings. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); <http://www.iee-sf.com/pdf/SummerFieldResults.pdf>

**Cost Impact:** Where homes have infiltration rates less than 5.0 ACH 50, and those homes are not already providing whole-house mechanical ventilation, the cost of construction will increase.

ICCFILENAME:MOORE-M1-401.2



## Public Hearing Results

This code change was contained in the errata posted on the ICC website. Please go to <http://www.iccsafe.org/cs/codes/Pages/09-10ProposedChanges.aspx>.”

### **PART II – IBC**

**Revise as follows:**

**1203.1 General.** Buildings shall be ventilated with natural ventilation in accordance Section 1203.4, or mechanical ventilation in accordance with the International Mechanical Code.

Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of ~~33.5 psf~~ 0.2 inch w.c. (50 Pa) in accordance with Section 402.4.2.1 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403 of the International Mechanical Code.

### **PART II – IBC**

**Committee Action:**

**Approved as Modified**

**Committee Reason:** Same reason as given for approval of M156-09/10 Part I. The modification corrects the pressure to be consistent with 50 Pa.

**Assembly Action:**

**None**

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## Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Craig Conner, Building Quality, representing self, requests Disapproval.**

**Commenter's Reason:** M156 Parts I and II specify a residential air-tightness test for application to commercial buildings. M156 Parts I and II do not actually require the test even be done. M156 applies only to the dwelling units in commercial buildings, a very limited subset of the commercial buildings.

Any commercial ventilation requirement should be based on air-tightness or ventilation requirements for commercial buildings (IECC Chapter 5, IBC Section 1203, or IMC Chapter 4 or Section 505).

M156 Parts I and II are inconsistent with EC147, which was approved at the first hearing. EC147 includes commercial air-tightness requirement and criteria.

M156 Part III applies to residential (IRC). M165 Part III will be unworkable as written. Based on the approved EC13 residential buildings will be allowed to test the air-tightness of a sample of homes produced by one builder, rather than all homes (presuming the approved EC13 stands). Many jurisdictions many test only a minority of the residences produced by a specific builder. However the lack of testing will make that section of code unusable.

A better way to exempt less air tight residences from the ventilation requirements is to make the exemption apply only houses tested and shown to have higher air-change rate. (Most residences will require ventilation.) Untested residences would require ventilation. EC13 references the ventilation requirements in IRC M1507. A ventilation exception based on a test is integrated into my comment on RM17 in IRC section M1507.

Final Action:            AS                    AM                    AMPC\_\_\_\_            D

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# M156-09/10, Part III

## R303.4

### Proposed Change as Submitted

**Proponent:** Mike Moore, Newport Ventures, representing Broan NuTone

#### PART III – IRC

**Insert new section as follows (renumber current Section 303.4 and those following as appropriate):**

**R303.4 Mechanical ventilation.** Where the air infiltration rate of a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section N1102.4.2.1, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.

*(Renumber remaining text)*

**Reason:** Everyone can agree that when dwelling units become “too” tight, they need mechanical ventilation. The question is, “how tight is too tight?” This code change proposal offers five air changes per hour at 50 Pascal as the “too tight” limit, and directs builders to provide mechanical ventilation at this point.

#### *Why is whole-house mechanical ventilation needed?*

Indoor air quality has direct impact on the health of building occupants. Poor indoor air quality is listed by the EPA as being the fourth largest environmental threat to our country.<sup>1</sup> A 2007 California study revealed formaldehyde exposure in most new homes is beyond limits recommended by the California Air Resources Board. Multiple studies have shown that relying on window operation to provide ventilation is not sufficient in practice.<sup>2,3</sup> If unchecked, pollutants from cleaning chemicals, finishes, furniture, and occupant activities can cause serious health effects on building occupants. Whole-house mechanical ventilation reduces occupant exposure to such pollutants.

#### *Why 5 ACH 50?*

Traditionally, 0.35 natural air changes per hour has been the consensus ventilation rate at which it is believed that sufficient fresh air is being provided to building occupants. This ventilation rate was typically achieved without mechanical ventilation because homes were built without an effective air barrier. As building practices have improved, homes have become tighter, and as homes become tighter, mechanical ventilation must be introduced to provide sufficient levels of ventilation.

ASHRAE Standard 136 was developed to enable calculation of natural air changes per hour as a function of air changes at various pressures. By following the calculation procedures in this standard, it can be shown that a natural infiltration rate of 0.35 air changes per hour is equivalent to somewhere between 7 ACH 50 to 10 ACH 50, depending on the local climatic conditions of the home. Because most dwellings are built this tight, ASHRAE 62.2 requires mechanical ventilation for all homes, with few exceptions. However, based on ASHRAE 136, a conservative code might prescribe whole-house mechanical ventilation for any home with an infiltration leakage rate of 10 ACH 50 or less.

As a second point of reference, California’s 2005 Title 24 Chapter 6 requires that, “Continuous mechanical ventilation (either exhaust or supply ventilation) must be installed when the target SLA is below 3.0”. California’s SLA of 3.0 is roughly equivalent to 6 ACH 50. As a third point of reference, NAHB’s National Green Building Standard requires whole-house mechanical ventilation when the infiltration rate falls below 5.0 ACH 50. This requirement provides clear recognition from a consensus standard that whole-house mechanical ventilation should be provided for all homes that meet this threshold.

Based on the previous references, there is broad consensus across states and within consensus standards that whole-house mechanical ventilation should be required when a dwelling’s infiltration falls below 5.0 ACH 50.

#### *What states are now requiring whole-house mechanical ventilation?*

Several states now require mechanical ventilation in dwellings, including MN, VT, WA, CA, and ME.

#### **References:**

1. ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*. <http://www.ashrae.org/technology/page/548>
2. Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620 <http://epb.lbl.gov/Publications/lbnl-59620.pdf>
3. Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in *IAQ 2007, Healthy and Sustainable Buildings*. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); <http://www.iee-sf.com/pdf/SummerFieldResults.pdf>

**Cost Impact:** Where homes have infiltration rates less than 5.0 ACH 50, and those homes are not already providing whole-house mechanical ventilation, the cost of construction will increase.

ICCFILENAME:MOORE-M1-401.2

## Public Hearing Results

### PART III – IRC

Modify the proposal as follows:

**R303.4 Mechanical ventilation.** Where the air infiltration rate of a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section N1102.4.2.1, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.

**Committee Action:**

**Approved as Modified**

**Committee Reason:** The proposed threshold is appropriate for determining where mechanical ventilation is required. This provides the builder with options. The modification corrects the pressure to be consistent with 50 Pa.

**Assembly Action:**

**None**

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### Individual Consideration Agenda

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Craig Conner, Building Quality, representing self, requests Disapproval.**

**Commenter's Reason:** M156 Parts I and II specify a residential air-tightness test for application to commercial buildings. M156 Parts I and II do not actually require the test even be done. M156 applies only to the dwelling units in commercial buildings, a very limited subset of the commercial buildings.

Any commercial ventilation requirement should be based on air-tightness or ventilation requirements for commercial buildings (IECC Chapter 5, IBC Section 1203, or IMC Chapter 4 or Section 505).

M156 Parts I and II are inconsistent with EC147, which was approved at the first hearing. EC147 includes commercial air-tightness requirement and criteria.

M156 Part III applies to residential (IRC). M165 Part III will be unworkable as written. Based on the approved EC13 residential buildings will be allowed to test the air-tightness of a sample of homes produced by one builder, rather than all homes (presuming the approved EC13 stands). Many jurisdictions many test only a minority of the residences produced by a specific builder. However the lack of testing will make that section of code unusable.

A better way to exempt less air tight residences from the ventilation requirements is to make the exemption apply only houses tested and shown to have higher air-change rate. (Most residences will require ventilation.) Untested residences would require ventilation. EC13 references the ventilation requirements in IRC M1507. A ventilation exception based on a test is integrated into my comment on RM17 in IRC section M1507.

Final Action:

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