2007/2008 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

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TENTATIVE ORDER OF DISCUSSION

2007/2008 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

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- FG4-07/08, Part II
- FG5-07/08, Part II
- FG6-07/08, Part II
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- FS5-07/08, Part V

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- G16-07/08, Part V
- G17-07/08, Part V

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M1–07/08
101.2

Proponent: John Stelzenmueller, City of Tualatin, OR, representing the Oregon Mechanical Officials Association

Revise as follows:

101.2 Scope. This code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and those systems utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed herein. Mechanical equipment and systems not specifically addressed in this code shall be approved by the code official. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the *International Fuel Gas Code*.

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

Reason: The scoping provisions found in the IMC give the sense that only equipment or systems that are permanently attached **and** are utilized in providing control of the building environment **or** which are specifically addressed elsewhere in the code are the only systems regulated by this code. It sometimes becomes problematic to regulate the installation of equipment or systems that are not used to "provide control of environmental conditions and related processes within buildings" or equipment that is not "specifically addressed" in the code. This code change is intended to help the local code official by providing a catch-all phrase for those permanently installed pieces of equipment that have historically been overlooked in previous code publications. This code change enhances the scoping provisions and will provide a defensible avenue to ensure the code officials have input to the installation of large kilns, glass blowing "glory holes", large coffee roasters, industrial dryers and other specialty types of equipment not currently addressed in the code.

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

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

M2–07/08
202

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise definition as follows:

COMBINATION FIRE/SMOKE DAMPER (Supp). A listed device installed in ducts and air transfer openings designed to close automatically upon the detection of heat and resist the passage of flame and smoke. The device is installed to operate automatically, ~~and~~ be controlled by a smoke detection system, and where required, is capable of being positioned from a fire command center .

Reason: To provide a consistent definition throughout all the I-codes. The phrase that is added is consistent with the IBC and IMC and is appropriate for the IMC as well considering that the bulk of the smoke control system is installed to the requirements of the IMC.

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

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

M3–07/08
202 (IFC [M] 602.1)

Proponent: Richard Swierczyna, Architectural Energy Corporation, representing the Commercial Kitchen Ventilation Technical Interest Group

Revise definition as follows:

HOOD (IFC [M] HOOD). An air intake device used to capture by entrapment, impingement, adhesion or similar means, grease, moisture, hot air and similar contaminants before they enter a duct system.

Type I. A kitchen hood for collecting and removing grease vapors and smoke. Such hoods are equipped with a fire suppression system.

Type II. A general kitchen hood for collecting and removing steam, ~~vapor~~, heat, ~~and odors~~ and products of combustion.

Reason: Clarify definitions of Type I and Type II hoods. The revised definitions are similar to the definitions in ASHRAE Standard 154 Ventilation of Commercial Cooking Processes

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

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

M4–07/08
202 (New)

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

Add new definition as follows:

INTERLOCK. A device actuated by another device with which it is directly associated, to govern succeeding operations of the same or allied devices. A circuit in which a given action cannot occur until after one or more other actions have taken place.

Reason: The term "**INTERLOCK**" has been tossed around rather loosely in the code. This definition is needed so the user can understand what an interlock really means as there is no such definition in the NEC. This definition is from the *Modern Dictionary of Electronics*, 7th edition.

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

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

M5–07/08
202

Proponent: Richard Swierczyna, Architectural Energy Corporation, representing the Commercial Kitchen Ventilation Technical Interest Group

Revise definition as follows:

SECTION 202
GENERAL DEFINITIONS

LIGHT-DUTY COOKING APPLIANCE (Supp). Light-duty cooking appliances include gas and electric ovens (including standard, bake, roasting, revolving, retherm, convection, combination convection/steamer, countertop conveyorized baking/finishing, ~~conveyor,~~ deck ~~or deck-style pizza,~~ and pastry), electric and gas steam-jacketed kettles, electric and gas pasta cookers, electric and gas compartment steamers (both pressure and atmospheric)and electric and gas cheese melters.

Reason: Clarify the differentiation between a lower input deck oven and a high input and effluent production of a conveyor pizza oven. Added countertop conveyorized baking/finishing oven due to the recent increased use in sandwich and c-stores.

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

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

M6–07/08

303.2 (New); IRC M1401.1.2 (New)

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

303.2 Equipment air intake opening location. Equipment and appliance intake openings shall be located not less than 10-feet horizontally from plumbing vents, exhaust terminations, chimneys and gas vents except where such vents, exhaust terminations and chimneys terminate not less than 3-feet above the top of the air intake opening.

(Renumber subsequent sections)

Reason: This general requirement is not new but the code doesn't come out and say what it means. This proposal is placed in the "General" Section as a global statement. Evaporative coolers are a great example where this would come into play. They are notorious for being installed too close to plumbing vent etc. and are very difficult to rectify after the fact.

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

PART II – IRC

Add new text as follows:

1401.1.2 Equipment air intake opening location Equipment and appliance intake openings shall be located not less than 10-feet horizontally from plumbing vents, exhaust terminations, chimneys and gas vents except where such vents, exhaust terminations and chimneys terminate not less than 3-feet above the top of the air intake opening.

Reason: This general requirement is not new but the code doesn't come out and say exactly what it means. This proposal is placed in the "General" Section as a global statement. Evaporative coolers are a great example where this would come into play. They are notorious for being installed too close to plumbing vents etc. and are very difficult to rectify after the fact.

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

PART I - IMC

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

PART II - IRC

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

M7–07/08
303.9 (New); IPC 301.7 (New); IFGC 301.16 (New)

Proponent: Lawrence Suggars, South Salt Lake City, UT, representing the Utah Chapter of ICC

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC, THE IPC AND THE IFGC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

303.9 Electrical equipment rooms. Where piping, ducts, equipment or appliances are installed in an electrical equipment room, the prohibited location requirements of NFPA 70 for such rooms shall apply.

Reason: The mechanical code in section 302 refers to the building code for a multitude of building code requirements. For example, the cutting, notching, and the boring of holes in framing members. This is a very good compliment to the building code. Just as important to the mechanical contractor is to be informed of the strict requirements governing the installation of equipment in electrical rooms found in the "electrical code". This added language will help to bring uniformity between the "IMC" and the "electrical code".

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

PART II – IPC

Revise as follows:

301.7 Electrical equipment rooms. Where piping, ducts, equipment or appliances are installed in an electrical equipment room, the prohibited location requirements of NFPA 70 for such rooms shall apply.

(Renumber subsequent sections)

Reason: For years the IPC has referred to other codes where necessary. For example 307.2 has informed the plumber that for the cutting, notching or bored holes in framing members to refer to the building code. In the Electrical Code there are very strict rules that govern the installation of both piping and equipment in" electrical equipment rooms". The requirement for adhering to electrical standards are just as important as building code requirements. This code change will help to build uniformity between the two codes and may save the contractors time and money.

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

PART III – IFGC

301.16 Electrical equipment rooms. Where piping, ducts, equipment or appliances are installed in an electrical equipment room, the prohibited location requirements of NFPA 70 for such rooms shall apply.

Reason: For years the IMC has referred to other codes where necessary. In the Electrical Code there are very strict rules that govern the installation of both piping and equipment in" electrical equipment rooms". The requirement for adhering to electrical standards are just as important as building code requirements. This code change will help to build uniformity between the two codes and may save the contractors time and money.

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

PART I – IMC

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

PART II – IPC

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

PART III – IFGC

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

M8–07/08
304.3, 304.4 (New)

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

1. Revise as follows:

304.3 Elevation of ignition source. Equipment and appliances having an ignition source and located in hazardous locations and public garages, private garages, repair garages, automotive motor-fuel-dispensing facilities and parking garages shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor surface on which the equipment or appliance rests~~. Such equipment and appliances shall not be installed in Group H occupancies or control areas where open use, handling or dispensing of combustible, flammable or explosive materials occurs.~~ For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

2. Add new text as follows:

304.4 Prohibited equipment and appliance location. Equipment and appliances having an ignition source shall not be installed in Group H occupancies or control areas where open use, handling or dispensing of combustible, flammable or explosive materials occur.

(Renumber subsequent sections)

Reason: This language is deserving of its own section as it's very specific in nature. Removing it permits everything in 304.3 to be legally installed in those occupancies. Isolating this group makes sense because certain appliances "cannot" be installed in this group H.

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

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

M9–07/08
304.9; IRC M1305.1.4.1, M1308.3; IFGC 305.7

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC, THE IRC MECHANICAL AND THE IFGC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

304.9 Clearances from grade. Equipment and appliances installed at grade level shall be supported on a level concrete slab or other approved material extending not less than 3 inches (76 mm) above adjoining grade or shall be suspended ~~a minimum of~~ not less than 6 inches (152 mm) above adjoining grade. Such support shall be in accordance with the manufacturer's installation instructions.

Reason: This change will make the IMC consistent with the IRC and a proposed change to the IFGC.

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

PART II – IRC

1. Revise as follows:

M1305.1.4.1 Ground clearance. Equipment and appliances supported from the ground shall be level and firmly supported on a concrete slab or other approved material extending not less than 3 inches (76 mm) above the adjoining ground. Such support shall be in accordance with the manufacturer's installation instructions. Appliances suspended from the floor shall have a clearance of not less than 6 inches (152 mm) from the ground.

2. Delete without substitution:

~~**M1308.3 Foundations and supports.** Foundations and supports for outdoor mechanical systems shall be raised at least 3 inches (76 mm) above the finished grade, and shall also conform to the manufacturer's installation instructions.~~

Reason: The two IRC Mechanical sections are addressing the same subject matter. It's more efficient to combine the two and have just one section covering the topic. The modification to IMC 304.9 and IFGC 305.7 are consistent language with that of M1305.1.4.1.

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

PART III – IFGC

Revise as follows:

305.7 Clearances from grade. Equipment and appliances installed at grade level shall be supported on a level concrete slab or other approved material extending not less than 3-inches (76 mm) above adjoining grade or shall be suspended ~~a minimum of~~ not less than 6 inches (152 mm) above adjoining grade.

Reason: This change will make the IFGC consistent with the IRC and a proposed change to the IMC.

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

PART I – IMC

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

PART II – IRC

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

PART III – IFGC

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

M10–07/08

306.1, 306.2, 306.3, 306.4, 306.5, 306.5.1; IRC M1305.1.3, M1305.1.4 (IFGC [M] 306.1, [M] 306.2, [M] 306.3, [M] 306.4, [M] 306.5, [M] 306.5.1)

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

306.1 (Supp) Access for maintenance and replacement. Mechanical equipment and appliances shall be provided with access. Appliances shall be accessible for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an appliance.

306.2 Appliances in rooms. Rooms containing appliances ~~requiring access~~ shall be provided with a door and an unobstructed passageway measuring not less than 36 inches (914 mm) wide and 80 inches (2032 mm) high.

Exception: Within a dwelling unit, appliances installed in a compartment, alcove, basement or similar space shall be accessed by an opening or door and an unobstructed passageway measuring not less than 24 inches (610 mm) wide and large enough to allow removal of the largest appliance in the space, provided that a level service space of not less than 30 inches (762 mm) deep and the height of the appliance, but not less than 30 inches (762 mm), is present at the front or service side of the appliance with the door open.

306.3 Appliances in attics. Attics containing appliances ~~requiring access~~ shall be provided with an opening and unobstructed passageway large enough to allow removal of the largest appliance. The passageway shall not be less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length measured along the center line of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring not less than 24 inches (610 mm) wide. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway and level service space are not required where the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1829 mm) high and 22 inches wide for its entire length, the passageway shall be not greater than 50 feet (15 250 mm) in length.

306.4 Appliances under floors. Under floor spaces containing appliances ~~requiring access~~ shall be provided with an access opening and unobstructed passageway large enough to remove the largest appliance. The passageway shall not be less than 30 inches (762 mm) high and 22 inches (559 mm) wide, nor more than 20 feet (6096 mm) in length measured along the centerline of the passageway from the opening to the appliance. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (305 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry. Such concrete or masonry shall extend a minimum of 4 inches (102 mm) above the adjoining grade and shall have sufficient lateral-bearing capacity to resist collapse. The clear access opening dimensions shall be a minimum of 22 inches by 30 inches (559 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open and the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet high (1929 mm) and 22 inches wide for its entire length, the passageway shall not be limited in length.

306.5 (Supp) Equipment and appliances on roofs or elevated structures. Where equipment and appliances ~~requiring access~~ are installed on roofs or elevated structures at a height exceeding16 feet (4877 mm), 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 four 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 withstanding100 pounds (488.2 kg/m^2) per square foot. Landing dimensions shall be not less than 18 inches 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.

306.5.1 (Supp) Sloped roofs. Where appliances, equipment, fans or other components ~~that require service~~ are installed on a roof having a slope of three units vertical in 12 units horizontal (25-percent slope) or greater and having an edge more than 30 inches (762 mm) above grade at such edge, a level platform shall be provided on each side of the appliance or equipment to which access is required for service, repair or maintenance. The platform shall be not less than 30 inches (762 mm) in any dimension and shall be provided with guards. The guards shall extend not less than 42 inches (1067 mm) above the platform, shall be constructed so as to prevent the passage of a 21-inch-diameter (533 mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code*. Access shall not require walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Where access involves obstructions greater than 30 inches in height, such obstructions shall be provided with ladders installed in accordance with Section 306.5 or stairs installed in accordance with the requirements specified in the *International Building Code* in the path of travel to and from appliances, fans or equipment requiring service.

PART II – IRC

Revise as follows:

M1305.1.3 Appliances in attics. Attics containing appliances ~~requiring access~~ shall have with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) long when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm) by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway and level service space are not required where the appliance can be serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1829 mm) high and 22 inches (559 mm) wide for its entire length, the passageway shall be not more than 50 feet (15 250 mm) long.

M1305.1.4 Appliances under floors. Under floor spaces containing appliances ~~requiring access~~ shall have an unobstructed passageway large enough to remove the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide, nor more than 20 feet (6096 mm) long when measured along the centerline of the passageway from the opening to the appliance. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm)wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (305 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry extending 4 inches (102 mm) above the adjoining grade in accordance with Chapter 4. The rough-framed access opening dimensions shall be a minimum of 22 inches by 30 inches (559 mm by 762 mm), where the dimensions are large enough to remove the largest appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open, and the appliance can be serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet high (1929 mm) and 22 inches wide for its entire length, the passageway shall not be limited in length.

Reason (Part I): This general statement covers all equipment no matter where located, not just equipment located on roofs, in attics and under floors. As far as 306.2 thru 306.5.1 are concerned, it is unnecessary to state the obvious. All appliances and equipment require access and service.

(Part II) This is redundant language. M1305.1 already states mechanical equipment and appliances require access. There is no need to state the obvious.

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

PART I – IMC

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

PART II – IRC

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

M11–07/08

306.2, 306.3, 306.4, 306.5; IRC M1305.1.3, M1305.1.4 (IFGC [M] 306.2, [M] 306.3, [M] 306.4, [M] 306.5

Proponent: Antwone J. Ross, Chesterfield County, VA, representing the Virginia Plumbing & Mechanical Inspectors Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

306.2 Appliances in rooms. Rooms containing appliances ~~requiring access~~ shall be provided with a door and an unobstructed passageway measuring not less than 36 inches (914 mm) wide and 80 inches (2032 mm) high.

Exception: Within a dwelling unit, appliances installed in a compartment, alcove, basement or similar space shall be accessed by an opening or door and an unobstructed passageway measuring not less than 24 inches (610 mm) wide and large enough to allow removal of the largest appliance in the space, provided that a level service space of not less than 30 inches (762 mm) deep and the height of the appliance, but not less than 30 inches (762 mm), is present at the front or service side of the appliance with the door open.

306.3 Appliances in attics. Attics containing appliances ~~requiring access~~ shall be provided with an opening and unobstructed passageway large enough to allow removal of the largest appliance. The passageway shall not be less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length measured along the center line of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring not less than 24 inches (610 mm) wide. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway and level service space are not required where the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1829 mm) high and 22 inches wide for its entire length, the passageway shall be not greater than 50 feet (15 250 mm) in length.

306.4 Appliances under floors. Underfloor spaces containing appliances ~~requiring access~~ shall be provided with an access opening and unobstructed passageway large enough to remove the largest appliance. The passageway shall not be less than 30 inches (762 mm) high and 22 inches (559 mm) wide, nor more than 20 feet (6096 mm) in length measured along the centerline of the passageway from the opening to the appliance. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (305 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry. Such concrete or masonry shall extend a minimum of 4 inches (102 mm) above the adjoining grade and shall have sufficient lateral-bearing capacity to resist collapse. The clear access opening dimensions shall be a minimum of 22 inches by 30 inches (559 mm by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open and the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet high (1929 mm) and 22 inches wide for its entire length, the passageway shall not be limited in length.

306.5 (Supp) Equipment and appliances on roofs or elevated structures. Where equipment and appliances ~~requiring access~~ are installed on roofs or elevated structures at a height exceeding16 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 four 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 withstanding100 pounds (488.2 kg/m^2) per square foot. Landing dimensions shall be not less than 18 inches 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.

PART II – IRC-M

Revise as follows:

M1305.1.3 Appliances in attics. Attics containing appliances ~~requiring access~~ shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) long when measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm) by 762 mm), where such dimensions are large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway and level service space are not required where the appliance can be serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1829 mm) high and 22 inches (559 mm) wide for its entire length, the passageway shall be not more than 50 feet (15 250 mm) long.

M1305.1.4 Appliances under floors. Underfloor spaces containing appliances ~~requiring access~~ shall have an unobstructed passageway large enough to remove the largest appliance, but not less than 30 inches (762 mm) high and 22 inches (559 mm) wide, nor more than 20 feet (6096 mm) long when measured along the centerline of the passageway from the opening to the appliance. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (305 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry extending 4 inches (102 mm) above the adjoining grade in accordance with Chapter 4. The rough-framed access opening dimensions shall be a minimum of 22 inches by 30 inches (559 mm by 762 mm), where the dimensions are large enough to remove the largest appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open, and the appliance can be serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet high (1929 mm) and 22 inches wide for its entire length, the passageway shall not be limited in length.

Reason: All appliances require access. The current code language is misleading and sometimes generates unnecessary discussions about which appliances need access and which don't. Section 306.1 already requires access.

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

PART I – IMC

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

PART II – IRC-M

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

M12–07/08
306.5 (IFGC [M] 306.5)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

306.5 (IFGC [M] 306.5) (Supp) Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring access are installed on roofs or elevated structures at a height exceeding16 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 four 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 withstanding100 pounds (488.2 kg/m^2) per square foot. Landing dimensions shall be not less than 18 inches 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.

<u>Alternating tread devices installed to provide the required access shall comply with the requirements of the International Building Code.</u>

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

Reason: The purpose of this proposed change is to allow the use of alternating tread devices as a means of access to equipment and appliances on roofs or elevated structures.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to equipment and appliances on roofs or elevated structures that is suitable for such application and that is not currently allowed by the code. Section 306.5 is overly restrictive in that it does not allow the use of alternating tread devices as a means of egress to equipment and appliances on roofs or elevated structures, but does allow ladders for such use.

Alternating tread devices have been shown by successful use of approximately 25 years and by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and side rails), are typically safer to use than vertical ladders and would be suitable for the application specified in Section 305.6. IBC-2006 allows the use of alternating tread devices as a means of egress in sections, including but not limited to 410.5.3, 1009.9, 1009.11, 1015.3, 1015.4, 1015.6.1 and 1019.1.2. Note: If approved, 2007/2008 code change proposals G130-07/08 and G131-07/08 will also add alternating tread devices as an access component to equipment platforms in IBC-2006 sections 502 and 505.5.

Bibliography

Performance, perceived safety and comfort of the alternating tread stair, Virginia Polytechnic and State University, Jorna, Mohageg and Snyder, March 1989
International Building Code, Section 1009.11
IBC 2007/08 Code Change Proposals G130-07/08 and G131-07/08.

Cost Impact: The code change proposal could minimally increase the cost of construction in some cases if alternating tread devices are used in lieu of ladders.

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

M13–07/08
306.5 (IFGC [M] 306.5)

Proponent: Tim Manz, University of Minnesota, representing the Association of Minnesota Building Officials (AMBO)

Revise as follows:

306.5 (IFGC [M] 306.5) (Supp) Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring access are installed on roofs or elevated structures at a height exceeding16 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 four 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 withstanding100 pounds (488.2 kg/m^2) per square foot. Landing dimensions shall be not less than 18 inches 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 and dwellings. The replacement of equipment and appliances on existing buildings shall not require the addition of access means that do not already exist.

Reason: The exception needs to be rewritten to specify that dwellings built under the IMC and existing buildings do not need to have permanent means of access when existing equipment is being replaced with new equipment. It is unreasonable to expect building owners to install permanent ladders when they are simply updating the rooftop HVAC&R equipment.

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

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

M14–07/08
306.5 (IFGC [M] 306.5)

Proponent: John W. Roberts, IES Engineers, representing himself

Revise as follows:

306.5 (IFGC [M] 306.5) (Supp) Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring access are installed on roofs or elevated structures at a height exceeding16 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 four 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 be stepladders and shall comply with the following minimum design criteria:

1. Ladders shall have handrails on both sides. The ~~side railing~~ handrails shall extend above the parapet or roof edge not less than 30 inches (762 mm). The minimum height of handrails shall be 36 inches (914 mm)
2. Ladders shall have ~~rung~~ tread 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)~~ 21 inches (533 mm) between handrails.
5. ~~Rungs~~ Treads shall have a minimum depth of ~~0.75-inch (19 mm) diameter~~ 4 inches (102 mm) and be capable of withstanding a 300-pound (136.1 kg) load.
6. Ladders shall have a slope of not greater than 12 units vertical in 4 units horizontal (300% slope).

~~6~~ 7. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding100 pounds (488.2 kg/m^2) per square foot. Landing dimensions shall be not less than 18 inches and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.

~~7~~ 8. 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: The purpose of this proposed change is to increase safety to maintenance personnel and to improve maintenance access to roof equipment. The current code only requires a vertical rung type ladder. The current code does not appear to require a safety cage.

The proposed change would require a ship's ladder with treads and handrails. This type of ladder would be much safer than a vertical ladder. It would allow a maintenance person to be able to safely carry tools, filters, and other items while climbing the ladder. Vertical ladders are not safe and are particularly hazardous when the rungs become wet or covered with mud. Falls are a common cause of workplace injury.

Cost Impact: The code change will increase the cost of construction. Since many ladders are installed inside the building with roof hatch access, the additional cost and space requirements for a ship's ladder should be modest.

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

M15–07/08
307.2.3 (IPC [M] 314.2.3)

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

Revise as follows:

307.2.3 (IPC [M] 314.2.3) Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1~~, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil or fuel-fired appliance that produces condensate, where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. One of the following methods shall be used:~~ where damage to any building components will occur as a result of overflow from the equipment condensate removal system, one of the following protection methods shall be provided for each cooling coil or fuel-fired appliance that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Metallic pans shall have a minimum thickness of not less than 0.0276-inch (0.7 mm) galvanized sheet metal. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

   Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

Reason: As originally written the existing text was adequate but not anymore. This proposed text deletes conflict within this section. It appears to require a pan or drain, but the recent additions to this section recognize new technology that does not have a drain or require a pan. Over the past several code cycles this section has had additions to allow more methods of secondary condensate removal. The proposed text incorporates the newly added methods as well as maintains openness to allow for any additional methods that may be developed in the future.

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

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

M16–07/08

Table 308.6, 307.2.3, 506.3.1.1, 507.4, 507.5, [F] 513.13.1 (IFC 909.13.1; IBC [F] 902.13.1), Table 603.4, 803.8, Table 803.9(1), Table 803.9(2), 803.10.4; IRC Table M1306.2, M1308.2, M1411.3.1, M1502.5, M1505.1, Table M1601.1.1(2), Table M1803.2; IFGC 404.5, 502.4, 502.7; IBC 716.5.3, 716.5.4, 716.6.1

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC, THE IRC MECHANICAL, THE IFGC AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES AS 4 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~shall be a minimum of 0.062-inch-thick (1.6 mm) steel~~ having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage), shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil or fuel-fired appliance that produces condensate, where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. ~~Metallic~~ Galvanized sheet steel pans shall have a minimum thickness of not less than ~~0.0276~~ 0.0236 -inch ~~(0.7 mm)~~ (0.6010 mm) (No. 24 gauge) galvanized sheet metal. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

   Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

TABLE 308.6
CLEARANCE REDUCTION METHODS

TYPE OF PROTECTIVE ASSEMBLY	REDUCED CLEARANCE WITH PROTECTION (inches)							
	Horizontal combustible assemblies located above the heat source				Horizontal combustible assemblies located beneath the heat source and all vertical combustible assemblies			
	Required clearance to combustibles without protection (inches)				Required clearance to combustibles without protection (inches)			
	36	18	9	6	36	18	9	6
Galvanized sheet ~~metal~~ steel, having a minimum ~~nominal~~ thickness of ~~0.024~~ 0.0236 inches (0.6010 mm) (No. 24 Gage), mounted on 1-inch glass fiber or mineral wool batt reinforced with wire on the back, 1 inch off the combustible assembly	18	9	5	3	12	6	6	3
Galvanized sheet ~~metal,~~ steel, having a minimum ~~nominal~~ thickness of ~~0.024~~ 0.0236 inch (0.6010 mm) (No. 24 Gage), spaced 1 inch off the combustible assembly	18	9	5	3	12	6	6	2
Two layers of galvanized sheet ~~metal,~~ steel, having a minimum ~~nominal~~ thickness of ~~0.024~~ 0.036 inch (0.6010 mm) (No. 24 Gage), having a 1-inch airspace between layers, spaced 1 inch off the combustible assembly	18	9	5	3	12	6	6	3
Two layers of galvanized sheet ~~metal~~ steel, having a minimum ~~nominal~~ thickness of ~~0.024~~ 0.0236 inch (0.6010 mm) (No. 24 Gage), having 1 inch of fiberglass insulation between layers, spaced 1 inch off the combustible assembly	18	9	5	3	12	6	6	3
0.5-inch inorganic insulating board, over 1 inch of fiberglass or mineral wool batt, against the combustible assembly	24	12	6	4	18	9	9	3
3.5-inch brick wall, spaced 1 inch off the combustible wall	—	—	—	—	12	6	6	6
3.5-inch brick wall, against the combustible wall	—	—	—	—	24	12	12	5

(Footnotes not shown remain unchanged)

506.3.1.1 (Supp) Grease duct materials. Grease ducts serving Type I hoods shall be constructed of steel ~~not less than 0.055 inch (1.4 mm) (No. 16 Gage) in thickness~~ having a minimum thickness of 0.575-inch (1.463 mm) (No. 16 gage) or stainless steel not less than ~~0.044~~ 0.0450-inch (1.14 mm) (No. 18 Gage) in thickness.

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

507.4 Type I materials. Type I hoods shall be constructed of steel ~~not less than 0.043 inch (1.09 mm) (No. 18 MSG) in thickness,~~ having a minimum thickness of 0.0466-inches (1.181 mm) (No. 18 Gage) or stainless steel not less than ~~0.037~~ 0.0335-inch ~~(0.94 mm)~~ (.8525 mm (No. 20 MSG) in thickness.

507.5 Type II hood materials. Type II hoods shall be constructed of steel ~~not less than 0.030 inch (0.76 mm) (No. 22 Gage) in thickness,~~ having a minimum thickness of 0.0296-inches (.7534 mm) (No. 22 Gage)or stainless steel not less than ~~0.024~~ 0.0220-inch ~~(0.61 mm)~~ (5550 mm) (No. 24 Gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/m2), or of other approved material and gage.

[F] 513.13.1 (IFC 902.13.1; IBC [F]902.13.1) Materials. Control-air tubing shall be hard-drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be

wrought copper or brass, solder type in accordance with ASME B 16.18 orASMEB16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100ºF (593ºC) and liquids below 1,500ºF (816ºC). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices provided all of the following conditions are met:

1. Tubing shall be listed by an approved agency for flame and smoke characteristics.
2. Tubing and connected device shall be completely enclosed within a galvanized or paint-grade steel enclosure ~~of not less than 0.030 inch (0.76 mm) (No. 22 galvanized sheet gage) thickness~~ having a minimum thickness of 0.0296-inches (.7534 mm) (No. 22 Gage) Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or teflon or by suitable brass compression to male barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within the enclosure. Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

TABLE 603.4
DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS

DUCT SIZE	GALVANIZED		~~APPROXIMATE~~ ALUMINUM ~~B & S GAGE~~ MINIMUM THICKNESS
	MINIMUM THICKNESS INCHES AND (mm)	EQUIVALENT GALVANIZED GAGE NO.	
Round ducts and enclosed rectangular ducts 14" or less ~~Over 14"~~ 16 and 18 inch 20 inch and over	 ~~0.013~~ 0.0157 (.3950 mm) ~~0.016~~ 0.0187 (.4712 mm) 0.0236 (.6010 mm)	 ~~30~~ 28 ~~28~~ 26 24	 ~~26~~ 0.0175 ~~24~~ 0.018 0.023
Exposed rectangular ducts 14" or less Over 14"[a]	 ~~0.016~~ 0.0157 (0.3950 mm) ~~0.019~~ 0.0187 (.4712 mm)	 28 26	 ~~24~~ 0.0175 ~~22~~ 0.018

a. For duct gages and reinforcement requirements at static pressures of ½", 1" and 2" w.g., SMACNA Duct Construction Standard, Tables 2-1; 2-2 and 2-3 shall apply.

803.8 Vent connector construction. Vent connectors shall be constructed of metal. The minimum ~~nominal~~ thickness of the connector shall be ~~0.019 inch (0.5 mm)~~ 0.0136-inches (.3462 mm) (No. 28 Gage) for galvanized steel, 0.022 inch (0.6 mm) (No. 26 B & S Gage) for copper, and 0.020 inch (0.5 mm) (No. 24 B & S Gage) for aluminum.

TABLE 803.9(1)
MINIMUM CHIMNEY CONNECTOR THICKNESS FOR LOW-HEAT APPLIANCES[a]

DIAMETER OF CONNECTOR (inches)	MINIMUM ~~NOMINAL~~ THICKNESS (~~galvanized~~) (inches) (mm)
~~5 and smaller~~	~~0.022 (No. 26 Gage)~~
~~Larger than 5 and up to 10~~	~~0.028 (No. 24 Gage)~~
~~Larger than 10 and up to 16~~	~~0.034 (No. 22 Gage)~~
14 inches and less	0.0157 (.3950 mm) (.No. 28 Gage)
~~Larger than 16~~ 16 and 18 inch[a]	~~0.064 (No. 16 Gage)~~ 0.0187 (.4712 mm) (No. 26 Gage)

For SI: 1 inch = 25.4 mm.

a. For sizes larger than 18 inches SMACNA Duct Construction Standard, Table 3-5 shall apply.

TABLE 803.9(2)
MINIMUM CHIMNEY CONNECTOR THICKNESS FOR
MEDIUM- AND HIGH-HEAT APPLIANCES

AREA (square inches)	EQUIVALENT ROUND DIAMETER (inches)	MINIMUM ~~NOMINAL~~ THICKNESS Inches (mm)	
0-154	0-14	~~0.060~~ 0.0575 (1.463 mm)	(No. 16 Gage)
155-201	15-16	~~0.075~~ 0.0705 (1.784 mm)	(No. 14 Gage)
202-254	17-18	~~0.105~~ 0.0994 (2.523 mm)	(No. 12 Gage)
Greater than 254	Greater than 18	~~0.135~~ 0.1292 (3.280 mm)	(No. 10 Gage)

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm^2.

TABLE 803.10.4
CHIMNEY CONNECTOR SYSTEMS AND CLEARANCES
TO COMBUSTIBLE WALL MATERIALS FORDOMESTIC HEATING APPLIANCES [a,b,c,d]

System A (12-inch clearance)	A 3.5-inch-thick brick wall shall be framed into the combustible wall. A 0.625-inch-thick fire-clay liner (ASTM C 315 or equivalent)e shall be firmly cemented in the center of the brick wall maintaining a 12-inch clearance to combustibles. The clay liner shall run from the outer surface of the bricks to the inner surface of the chimney liner.
System B (9-inch clearance)	A labeled solid-insulated factory-built chimney section (1-inch insulation) the same inside diameter as the connector shall be utilized. Sheet ~~metal~~ steel supports cut to maintain a 9-inch clearance to combustibles shall be fastened to the wall surface and to the chimney section. Fasteners shall not penetrate the chimney flue liner. The chimney length shall be flush with the masonry chimney liner and sealed to the masonry with water-insoluble refractory cement. Chimney manufacturers' parts shall be utilized to securely fasten the chimney connector to the chimney section.
System C (6-inch clearance)	A ~~sheet metal~~ steel ~~(minimum number 24 Gage)~~ ventilated thimble having a minimum thickness of 0.0236-inches (.6010 mm) (No.24 Gage) having two 1-inch air channels shall be installed with a ~~sheet~~ steel chimney connector. ~~(minimum number 24 Gage). Sheet~~ Steel supports ~~(minimum number 24 Gage)~~ shall be cut to maintain a 6-inch clearance between the thimble and combustibles. The chimney connector and steel supports shall have a minimum thickness of 0.0236-inches (.6010 mm) (No 24 Gage) . One side of the support shall be fastened to the wall on all sides. Glass-fiber insulation shall fill the 6-inch space between the thimble and the supports.
System D (2- inch clearance)	A labeled solid-insulated factory-built chimney section (1-inch insulation) with a diameter 2 inches larger than the chimney connector shall be installed with a ~~sheet~~ steel chimney connector ~~(minimum number 24 Gage)~~ having a minimum thickness of 0.0236-inches (.6010 mm) (No.24 Gage). Sheet ~~metal~~ steel supports shall be positioned to maintain a 2-inch clearance to combustibles and to hold the chimney connector to ensure that a 1-inch airspace surrounds the chimney connector through the chimney section. The steel support shall be fastened to the wall on all sides and the chimney section shall be fastened to the supports. Fasteners shall not penetrate the liner of the chimney section.

(Footnotes not shown remain unchanged)

PART II – IRC-M

1. Revise as follows:

TABLE M1306.2

REDUCTION OF CLEARANCES WITH SPECIFIED FORMS OF PROTECTION[a, b, c, d, e, f, g, h, i, j, k]

TYPE OF PROTECTION APPLIED TO AND COVERING ALL SURFACES OF COMBUSTIBLE MATERIAL WITHIN THE DISTANCE SPECIFIED AS THE REQUIRED CLEARANCE WITH NO PROTECTION [See Figures M1306.1 and M1306.2]	WHERE THE REQUIRED CLEARANCE WITH NO PROTECTION FROM APPLIANCE, VENT CONNECTOR, OR SINGLE WALL METAL PIPE IS:									
	36 inches		18 inches		12 inches		9 inches		6 inches	
	Allowable clearances with specified protection (Inches)b									
	Use column 1 for clearances above an appliance or horizontal connector. Use column 2 for clearances from an appliance, vertical connector and single-wall metal pipe.									
	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2
3½-inch thick masonry wall without ventilated air space	-----	24	-----	12	-----	9	-----	6	-----	5
½-in. insulation board over 1-inch glass fiber or mineral wool batts	24	18	12	9	9	6	6	5	4	3
~~24 gage sheet metal~~ Galvanized sheet steel having a minimum thickness of 0.0236- inches (.6010 mm) (No.24 Gage) over 1-inch glass fiber or mineral wool batts reinforced with wire on rear face with a ventilated air space	18	12	9	6	6	4	5	3	3	3
3½-inch thick masonry wall with ventilated air space	-----	12	-----	6	-----	6	-----	6	-----	6
~~24 gage sheet metal~~ Galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No. 24 Gage) with a ventilated air space 1-inch off the combustible assembly	18	12	9	6	6	4	5	3	3	2
½-inch thick insulation board with ventilated air space	18	12	9	6	6	4	5	3	3	3
~~24 gage sheet metal~~ Galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No 24 Gage) with ventilated air space over 24 gage sheet ~~metal~~ steel with a ventilated air space	18	12	9	6	6	4	5	3	3	3
1-inch glass fiber or mineral wool batts sandwiched between two sheets ~~24 gage sheet metal~~ of galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No.24 Gage) with a ventilated air space.	18	12	9	6	6	4	5	3	3	3

(Footnotes not shown remain unchanged)

M1308.2 Protection against physical damage. In concealed locations where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~shall be a minimum of 0.062-inchthick (1.6 mm) steel~~ having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage), shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

M1411.3.1 (Supp) Auxiliary and secondary drain systems. In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be a minimum of 3/4-inch (19 mm) nominal pipe size. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be installed under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. ~~Metallic~~ Galvanized sheet steel pans shall have a minimum thickness of not less than ~~0.0276-inch~~ 0.0236-inches ~~(0.7 mm)~~ (.6010 mm) (No. 24 Gage) ~~galvanized sheet metal~~. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. This overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be installed under the coils on which condensate will occur. This pan shall be equipped with a water level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The pan shall be equipped with a fitting to allow for drainage. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line or the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

M1502.5 Duct construction. Exhaust ducts shall be constructed of rigid metal, having a minimum thickness of ~~0.016-inch thick (0.4 mm) rigid metal ducts,~~ 0.0157-inches (.3950 mm) (No. 28 Gage) ~~having~~ and shall have smooth interior surfaces with joints running in the direction of air flow. Exhaust ducts shall not be connected with sheet-metal screws or fastening means which extend into the duct.

M1505.1 General. Domestic open-top broiler units shall be provided with a metal exhaust hood, ~~not less than 28 gage~~, having a minimum thickness of 0.0157-inches (.3950 mm (No. 28 Gage) with 1/4 inch (6 mm) clearance between the hood and the underside of combustible material or cabinets. A clearance of at least 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinet. The hood shall be at least as wide as the broiler unit and shall extend over the entire unit. Such exhaust hood shall discharge to the outdoors and shall be equipped with a backdraft damper or other means to control infiltration/exfiltration when not in operation. Broiler units incorporating an integral exhaust system, and listed and labeled for use without an exhaust hood, need not be provided with an exhaust hood.

2. Delete and substitute as follows:

TABLE M1601.1.1(2)
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING

~~TYPE OF DUCT~~	~~SIZE (inches)~~	~~MINIMUM THICKNESS (inch)~~	~~EQUIVALENT GALVANIZED SHEET GAGE~~	~~APPROXIMATE ALUMINUM B & S GAGE~~
~~Round ducts and enclosed rectangular ducts~~	~~14 or less~~ ~~over 14~~	~~0.013~~ ~~0.016~~	~~30~~ ~~28~~	~~26~~ ~~24~~
~~Exposed rectangular ducts~~	~~14 or less~~ ~~over 14~~	~~0.016~~ ~~0.019~~	~~28~~ ~~26~~	~~24~~ ~~22~~

TABLE M1601.1.1(2)
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING

DUCT SIZE	Galvanized		Aluminum
	Minimum thickness inches and (mm)	Equivalent galvanized gage no.	Minimum thickness
Round ducts and enclosed rectangular ducts 14" or less 16 and 18 inch 20 inch and over	0 .0157 (.3950 mm) 0.0187 (.4712 mm) 0.0236 (.6010 mm)	28 26 24	0.0175 0.018 0.023
Exposed rectangular ducts 14" or less Over 14"[a]	0.0157 (.3950 mm) 0.0187 (.4712 mm)	28 26	0.0175 0.018

For SI: 1 inch = 25.4 mm.

a. For duct gages and reinforcement requirements at static pressures of ½", 1" and 2" w.g., SMACNA Duct Construction Standard, Tables 2-1; 2-2 and 2-3 shall apply.

3. Revise table as follows:

TABLE M1803.2
THICKNESS FOR SINGLE-WALL METAL PIPE CONNECTORS[a]

DIAMETER OF CONNECTOR (inches)	GALVANIZED SHEET METAL GAGE NUMBER	MINIMUM THICKNESS (inch) (mm)
~~Less than 6~~	~~26~~	~~0.019~~
~~6 to 10~~ 14 inches and less	~~24~~ 28	~~0.024~~ 0.0157 (.3950 mm)
~~Over 10 through 16~~ 16 and 18 inch[a]	~~22~~ 26	~~0.029~~ 0.0187 (.4712 mm)

For SI: 1 inch = 25.4 mm.

a. For sizes larger than 18 inches SMACNA Duct Construction Standard, Table 3-5 shall apply.

PART III – IFGC

Revise as follows:

404.5 Protection against physical damage. In concealed locations, where piping other than black or galvanized steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~shall be a minimum of 1/16-inch-thick (1.6 mm) steel,~~ having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage) shall cover the area of the pipe where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

502.4 Insulation shield. Where vents pass through insulated assemblies, an insulation shield constructed of steel ~~not less than 26 gage sheet (0.016 inch) (0.4 mm) metal~~ having a minimum thickness of 0.0187-inches (.4712 mm) (No. 26 Gage) shall be installed to provide clearance between the vent and the insulation material. The clearance shall not be less than the clearance to combustibles specified by the vent manufacturer's installation instructions. Where vents pass through attic space, the shield shall terminate not less than 2 inches (51 mm) above the insulation materials and shall be secured in place to prevent displacement. Insulation shields provided as part of a listed vent system shall be installed in accordance with the manufacturer's installation instructions.

502.7 Protection against physical damage. In concealed locations, where a vent is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the vent shall be protected by shield plates. Protective steel shield plates ~~shall be a minimum of 1/16-inch thick (1.6 mm) steel,~~ having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage) shall cover the area of the vent where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

716.5.3 (Supp) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
   1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
   1.2. Penetrations are tested in accordance with ASTME119 or UL263 as part of the fire-resistance rated assembly; or
   1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
   2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a ~~wall thickness of at least 0.019 inch (0.48 mm); and~~ minimum thickness of .0187-inches (0.4712 mm) (No. 26 Gage)
   2.2. That extend at least 22 inches (559 mm) vertically; and
   2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust system when installed in accordance with the *International Mechanical Code*.

716.5.4 (Supp) Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where any of the following apply:

1. The partitions are tenant separation or corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 712.
2. Tenant partitions in covered mall buildings where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of approved materials in accordance with the *International Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
   3.1. The duct shall not exceed 100 square inches (0.06 m^2).
   3.2. The duct shall be constructed of steel ~~a minimum of 0.0217 inch (0.55 mm) in thickness~~ having a minimum thickness of 0.0157-inches (0.3950 mm) (No. 28 Gage).
   3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.
   3.4. The duct shall be installed above a ceiling.
   3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
   3.6. A minimum 12-inch-long (305 mm) ~~by 0.060 inch thick (1.52 mm)~~ steel sleeve having a minimum thickness of 0.0575-inches (1.465 mm) (No. 16 Gage) shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum 11/2-inch by 11/2-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

716.6.1(Supp) Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel ~~not less than 0.019 inch (0.48 mm) (26 gage) in thickness~~ having a minimum thickness of 0.0187-inches ((0.4712 mm) (No. 26 Gage).
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m^2) in any 100 square feet (9.3 m^2) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance- rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

Reason: The code has been inconsistent in its approach to decimals and the related gages. This is a much needed clean up in an attempt to bring consistency in language as it relates to stated decimals and gages. The gage should always accompany a decimal as most end users relate to a gage as opposed to a decimal. Some decimals were not accurate to the stated gage. Also, some of the gages stated in the tables were not consistent with the standard and were changed to reflect that. Now anyone can reference the SMACNA standard and go to Table A-2; A-4 and 3-5 and see where the numbers come from. A new footnote has been added to Tables 603.4, 803.9 (1) and 503.10.2.4 to direct the user to more information that doesn't necessarily need to be in the code. There are many combinations of gages and reinforcement methods available for use which means no one particular gage fits all situations. This itemized account will make things clearer as to the intent of this change.

Bibliography

SMACNA Duct Construction Standards, 2005, Table A-1 and A-3; Sheet Metal and Air Conditioning Contractors National Association, Inc.; Chantilly, VA.

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

PART I – IMC

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

PART II – IRC-M

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

PART III – IFGC

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

PART IV – IBC FIRE SAFETY

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

M17–07/08
Table 308.6; IRC Table M1306.2

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise table as follows:

TABLE 308.6
CLEARANCE REDUCTION METHODS[b]

(No change to table)

For SI: 1 inch = 25.4 mm, ºC = [(ºF)-32]/1.8, 1 pound per cubic foot = 16.02 kg/m^3, 1.0 Btu • in/ft^2• h • ºF = 0.144 W/m^2• K.
a. (No change)
b. For limitations on clearance reduction for solid fuel-burning appliances, see Section 308.7

Reason: There have been cases where 308.7 is being overlooked, thus installers have been attempting to install solid fuel appliances with 6 and 9-inch clearances when 12 is the absolute minimum. This footnote will aid in the proper installation of solid fuel appliances.

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

PART II – IRC-M

Revise table as follows:

TABLE M1306.2
REDUCTION OF CLEARANCES WITH SPECIFIED FORMS OF PROTECTION[a,b,c,d,e,f,g,h,i,j,k,l]

(Portions of table not shown remain unchanged)

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.019 kg/m^3, °C = [(°F)-32/1.8], 1 Btu/(h ▪ ft^2 ▪ °F/in.) = 0.001442299 (W/cm^2 ▪ °C/cm).
a. through k. (No change)
b. For limitations on clearance reduction for solid fuel-burning appliances see Section M1306.2.1.

Reason: There have been cases where M1306.2.1 is being overlooked, thus installers have been attempting to install solid fuel appliances with 6 and 9-inch clearances when 12 is the absolute minimum. This footnote will aid in the proper installation of solid fuel appliances.

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

PART I – IMC

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

PART II – IRC-M

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

M18–07/08
312.1, Chapter 15 (New)

Proponents: Wesley R. Davis, Air Conditioning Contractors of America; Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

1. Revise as follows:

312.1 Load calculations. Heating and cooling system design loads for the purpose of sizing systems, appliances and equipment shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183 ~~*Handbook of Fundamentals*~~. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE Handbook - HVAC *Systems and Equipment*. Alternatively, design loads shall be determined by an approved equivalent computation procedure, using the design parameters specified in Chapter 3 of the *International Energy Conservation Code*.

2. Add standard to Chapter 15 as follows:

ASHRAE/ACCA

Standard 183-2007	Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings

Reason: ANSI/ASHRAE/ACCA Standard 183 – 2007, *Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings* was recently approved as the new ANSI standard for structures and premises set forth in §101 of the International Mechanical Code. This document standardizes the methodology in the *Handbook of Fundamentals* and is suitable to replace the Handbook as the reference document.

ANSI/ASHRAE/ACCA Standard 183 – 2007 sets the minimum requirements for methods and procedures used to perform peak cooking and heating load calculations.

ANSI/ASHRAE/ACCA Standard 183 - 2007 is the ANSI standard for commercial peak heating and cooling load calculations.

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

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE/ACCA Standard 183-2007, 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 January 15, 2008.

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

M19–07/08
313 (New), 313.1 (New), 313.2 (New), 313.2.1 (New), 313.2.2 (New)

Proponent: Tim Manz, University of Minnesota, representing the Association of Minnesota Building Officials (AMBO)

Add new text as follows:

SECTION 313
TESTING AND BALANCING

313.1 Mechanical ventilation and hydronic systems. All mechanical ventilation and hydronic systems shall be balanced in accordance with this section.

313.2 System balancing reports. System balancing reports shall verify system performance specified in Sections 313.2.1 and 313.2.2 and shall specify that the minimum amount of outdoor air required in Chapter 4 is provided to the ventilation system. System balancing reports shall be submitted to the code official.

313.2.1 Mechanical ventilation system balancing. Mechanical ventilation systems shall provide airflow rates within 10 percent of design capacities. Fan speed shall be adjusted to meet design airflow.

Exception: Balancing shall not be required for fan motors rated at one horsepower (0.746 kW) or less.

313.2.2 Hydronic system balancing. Hydronic systems shall provide flow rates within 10 percent of design capacities. Pump impellers shall be trimmed or pump speed shall be adjusted to meet design flow.

Exception: Balancing shall not be required for pump motors rated at five horsepower (3.73 kW) or less.

Reason: Testing and balancing of HVAC&R systems is critical to ensure that they are installed and operate as designed. The above requirements are consistent with those established in the industry by various organizations and result in a clear and concise testing and balancing requirement that is easily enforced by the code official.

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

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

M20–07/08
313 (New), 313.1 (New), Chapter 15 (New)

Proponent: Wesley R. Davis, Air Conditioning Contractors of America

1. Add new text as follows:

SECTION 313
HEATING AND COOLING SYSTEM MAINTENANCE

313.1 General. Owners of buildings regulated by this code shall enact consistent practices for inspecting and maintaining their heating and cooling systems in accordance with ASHRAE/ACCA 180 and the manufacturer's maintenance instructions.

2. Add standard to Chapter 15 as follows:

ANSI/ASHRAE/ACCA
Standard 180 – 2007 Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems

Reason: To safeguard the health and safety of building occupants or visiting members of the public it is necessary that heating and cooling systems be maintained for safe and healthy delivery of conditioned air. When there is no routine inspection and subsequent adjustment or maintenance of system components, the system is typically found operating outside its performance parameters.

ANSI/ASHRAE/ACCA Standard 180 – 2007, *Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems* was established for the public good to ensure that HVAC systems in buildings where people work, visit, or reside, continue to support a healthy and safe indoor environment.

ANSI/ASHRAE/ACCA Standard 180 - 2007 is the ANSI standard practice for the inspection and maintenance of commercial HVAC systems.

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

Analysis: A review of the standard proposed for inclusion in the code, ANSI/ASHRAE/ACCA Standard 180 – 2007, 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 January 15, 2008.

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

M21–07/08
401.4.1

Proponent: Randall R. Dahmen, Wisconsin Registered PE and Licensed Commercial Building Inspector, Waunakee, WI

Revise as follows:

401.4.1 (Supp) Intake openings. Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this code. Where a source of contaminant is located within 10 feet (3048 mm) horizontally of an intake opening, such opening shall be located a minimum of 2 feet (610 mm) below the contaminant source.

Environmental air exhausted from a residential dwelling shall not be considered to be a hazardous or noxious contaminant.

Where openings below grade are used as part of a mechanical ventilation system, such openings shall have a horizontal cross section equal to or greater than the free area of the outdoor air intake opening. The lowest side of the outdoor air intake shall be located not less than 12 inches (305 mm) vertically from the adjoining grade level or above the bottom of an areaway.

Reason: The *International Building Code*, Section 1203.4.1.2 addresses openings below grade, provided they are used for natural ventilation. The proposed amendment addresses openings below grade provided that they are used for mechanical ventilation, which is not currently addressed. The proposed wording ensures that the air movement into the building will not be restricted by below grade openings, nor materials which may become located near the outside air intake. By requiring the outside air intake to be a minimum of 12" above adjoining grade level or above the bottom of an areaway, air flow will not be limited by the accumulation of snow, dirt, leaves, etc. The 12" commonly referenced as a minimum distance above grade and is typically used as an industry standard.

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

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

M22–07/08

401.4, 401.4.1, 401.4.2, 401.4.3, 401.5, Table 401.5, 501.2.1, 501.2.2 (New)

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

1. Delete and substitute as follows:

~~**401.4 Opening location.** Outdoor air exhaust and 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.~~

~~**Exceptions:**~~

~~1. Group R-3.~~
~~2. Exhaust outlets for environmental air exhaust openings shall be located not less than 3 feet (914 mm) from property lines and not less than 3 feet (914 mm) from openings into the building.~~

401.4 Intake opening location. Air intake openings shall comply with all of 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, except as specified in Item 3 or Section 501.2.1.
3. Intake openings shall be located not less than 3-feet below or 25 feet above contaminant sources where such sources are located within 10-feet (3048 mm) of the opening.

2. Delete without substitution:

~~**401.4.1 (Supp) Intake openings.** Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this code. Where a source of contaminant is located within 10 feet (3048 mm) horizontally of an intake opening, such opening shall be located a minimum of 2 feet (610 mm) below the contaminant source.~~

~~Environmental air exhausted from a residential dwelling shall not be considered to be a hazardous or noxious contaminant.~~

~~**401.4.2 Exhaust openings.** Outdoor exhaust openings shall be located so as not to create a nuisance. Exhaust air shall not be directed onto walkways.~~

~~**[B] 401.4.3 Flood hazard.** For structures located in flood hazard areas, outdoor exhaust openings shall be at or above the design flood elevation.~~

3. Revise as follows:

401.5 ~~Outdoor~~ Intake opening protection. Air ~~exhaust and~~ intake openings that terminate outdoors shall be protected with corrosion- resistant screens, louvers or grilles. Openings in louvers, grilles and screens shall be sized in accordance with Table 401.5, and shall be protected against local weather conditions. Outdoor air ~~exhaust and~~ intake openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code.*

TABLE 401.5
OPENING SIZES IN LOUVERS, GRILLES AND
SCREENS PROTECTING ~~OUTDOOR EXHAUST AND~~ AIR INTAKE OPENINGS

OUTDOOR OPENING TYPE	MINIMUM AND MAXIMUM OPENING SIZES IN LOUVERS, GRILLES AND SCREENS MEASURED IN ANY DIRECTION
~~Exhaust openings~~	~~Not < ¼ inch and not > ½ inch~~
Intake openings in residential occupancies	Not < ¼ inch and not > ½ inch
Intake openings in other than residential occupancies	> ¼ inch and not > 1 inch

For SI: 1 inch = 25.4 mm.

501.2.1 (Supp) Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. ~~Environmental air duct exhaust terminations shall comply with Section 401.4.~~

   ~~**Exception:** Exhaust from bathrooms and kitchens in residential dwellings complying with Section 401.4.1.~~

3. For all environmental air exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all occupancies other than Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.
4. For specific systems see the following sections:
   - 4.1. Clothes dryer exhaust, Section 504.4
   - 4.2. Kitchen hoods and other kitchen exhaust equipment, Sections 506.3.12, 506.4 and 506.5
   - 4.3. Dust, stock and refuse conveying systems, Section 511.2
   - 4.4. Subslab soil exhaust systems, Section 512.4~~, and~~
   - 4.5. Smoke control systems, Section 513.10.3
   - 4.6. Refrigerant discharge, Section 1105.7
   - 4.7 Machinery room discharge, Section 1105.6.1

4. Add new text as follows:

501.2.1.1 Exhaust discharge. Exhaust air shall not be directed onto walkways. Exhaust outlets serving structures in hazardous locations shall be installed at or above the designed flood elevation

501.2.2 Exhaust opening protection. Exhaust openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles. Openings in screens, louvers and grilles shall be not less than ¼ inch and not greater than ½-inch in size, measured in any direction. Openings shall be protected against local weather conditions. Outdoor openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

Reason: This is an effort to bring order and consistency to these two sections. These sections are broken and in serious need of re-organization. Fist of all, to have exhaust openings mixed in with intake openings in a ventilation chapter doesn't make a whole lot of sense. All references to exhaust openings have been relocated to chapter 5 where they belong. All requirements for intake openings will remain in chapter 4 where they belong. Intake openings have been re-organized in an easy to read format with no current requirements omitted. Table 401.5 requirements for exhaust openings have been relocated to the new 501.2.2. Section 501.2.1 #3 has been stricken and the exceptions also as it excluded kitchen and bath from any requirements at all. Section 401.4 has been stricken in its entirety along with the exceptions because 501.2.1 #3 includes ALL

environmental exhaust so there is no need for an exception. Also 401.3 has been relocated to 501.2.1 as well. The 2-foot dimension has been changed to 3-feet as it is consistent with IMC-918.6; IRC-G2427.7; G2427.8 #1; and IFGC Sections 503.6.7 and 618.5. A new 25 feet dimension has been added so as not to prohibit an opening to be installed less than 10-feet from contaminants if the opening is positioned much higher than the contaminant source.

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

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

M23–07/08
403.2.1

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

Revise as follows:

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

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent ~~or more~~ of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.
4. Where mechanical exhaust is required by Note g in Table 403.3, mechanical exhaust is required and recirculation is prohibited where more than 10 percent ~~or more~~ of the resulting supply airstream consists of air recirculated from these spaces.

Reason: This is a simple fix to make items #2 and 4 consistent with footnote g. of Table 403.3 . Footnote g. states that not more than 10% can be recirculated, so exactly 10% could be recirculated. Items 2 and 4 say 10% or more is prohibited from being re-circulated, so, exactly 10% could NOT be recirculated. This change makes it clear that not more than exactly 10% can be recirculated

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

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

M24–07/08
Table 403.3

Proponent: Mark Riley, City of Troy, MI, representing the Mechanical Inspectors of Michigan

Revise table as follows:

TABLE 403.3 (Supp)
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	People Outdoor Airflow Rate in Breathing Zone Cfm/person	Area Outdoor Airflow Rate In Breathing Zone Ra cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate Cfm/ft^{2a}
Workrooms				
Bank vaults/safe deposit	5	0.06	5	
Darkrooms	–	–	–	1.0
Copy, printing rooms	5	0.06	4	0.5
Meat processing[c]	15	–	10	–
Mechanical rooms[i,j]		0.50 cfm/ft^2		
Pharmacy (prep. area)	5	0.18	10	–
Photo studios	5	0.12	10	–
Computer (without printing)	5	0.06	4	–

For SI: 1 cubic foot per minute = 0.0004719 m3/s, 1 ton = 908 kg,

1 cubic foot per minute per square foot = 0.00508 m3/(s•m2),
°C = [(°F) -32]/1.8, 1 square foot = 0.0929 m2.
a. through h. (No change)

i. Mechanical ventilation of a mechanical room is not required where combustion air openings to the outdoors are provided for non-direct-vent fuel-fired appliances located in such mechanical room.

j. Ventilation of a mechanical room is not required to be continuous where the ventilation system is designed to limit the space temperature in such room and is cycled by a temperature control.

(Portions of table and footnotes not shown remain unchanged)

Reason: Now that larger fuel fired appliances are direct vent appliances, there can be a problem with the mechanical room overheating due to heat given off from the appliances which use 100% outside air for combustion air. Right now there is no code language requiring ventilation air in mechanical rooms where natural ventilation cannot be provided. Several manufactures already require this in their instructions for direct vent appliances. This requirement is already required in the *ASHRAE 15* refrigeration code for refrigeration rooms.

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

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

M25–07/08

202, 403.3, Table 403.3, 403.3.1, 403.3.1.1, 403.3.1.2, Table 403.3.1.2, 403.3.1.3, 403.3.1.3, 403.3.2, 403.3.2.1, 403.3.2.2, 403.3.2.3, 403.3.2.3.1, 403.3.2.3.2, Table 403.3.2.3.2, 403.3.2.3.3, 403.3.2.3.4, 403.3.3, 403.3.4, 403.3.5 (New), 403.3.6 (New), 403.3.7 (New), 403.3.8 (New), 403.3.8.1 (New), 403.3.8.2 (New), 404.2

Proponents: Gil Avery, PE, HVAC Consultant, representing himself; Danny L. Reagan, PE, Stantec Consulting Ltd., representing himself

1. Delete Sections 403.3 through 403.3.4 and Tables 403.3, 403.3.1.2 and 403.3.2.3.2 and replace as follows:

~~**403.3 (Supp) Outdoor airflow rate.** Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.~~

~~With the exception of smoking lounges, the ventilation rates in Table 403.3 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3 in accordance with accepted engineering practice.~~

~~**Exception:** The occupant load is not required to be determined, based on the estimated maximum occupant load rate indicated in Table 403.3 where approved statistical data document the accuracy of an alternate anticipated occupant density.~~

~~**403.3.1 (Supp) Zone outdoor airflow.** The minimum outdoor airflow required to be supplied to each zone shall be determined as a function of occupancy classification and space air distribution effectiveness in accordance with Sections 403.3.1.1 through 403.3.1.3.~~

~~**403.3.1.1 (Supp) Breathing zone outdoor airflow.** The outdoor airflow rate required in the breathing zone (V_{bz}) of the occupiable space or spaces in a zone shall be determined in accordance with Equation 4-1.~~

$$V_{bz} = R_p P_z + R_a A_z \qquad \text{(Equation 4-1)}$$

~~where:~~

~~A_z = *zone floor area*: the net occupiable floor area of the space or spaces in the zone.~~

~~P_z = *zone population*: the number of people in the space or spaces in the zone.~~

~~R_p = *people outdoor air rate:* the outdoor airflow rate required per person from Table 403.3~~
~~R_a = *area outdoor air rate:* the outdoor airflow rate required per unit area from Table 403.3~~

403.3.1.2 (Supp) Zone air distribution effectiveness. The zone air distribution effectiveness (E_z) shall be determined using Table 403.3.1.2.

TABLE 403.3.1.2 (Supp)
ZONE AIR DISTRIBUTION EFFECTIVENESS[a,b,c,d,e]

Air Distribution Configuration	E_z
Ceiling or floor supply of cool air	1.0[f]
Ceiling or floor supply of warm air and floor return	1.0
Ceiling supply of warm air and ceiling return	0.8[g]
Floor supply of warm air and ceiling return	0.7
Makeup air drawn in on the opposite side of the room from the exhaust and/or return	0.8
Makeup air drawn in near to the exhaust and/or return location	0.5

For SI: 1 foot = 304.8 mm, 1 foot per minute = 0.00506 m/s, °C = [(°F) – 32]/1.8.

a. "Cool air" is air cooler than space temperature.
b. "Warm air" is air warmer than space temperature.
c. "Ceiling" includes any point above the breathing zone.
d. "Floor" includes any point below the breathing zone.
e. "Makeup air" is air supplied or transferred to a zone to replace air removed from the zone by exhaust or return systems.
f. Zone air distribution effectiveness of 1.2 shall be permitted for systems with a floor supply of cool air and ceiling return, provided that low-velocity displacement ventilation achieves unidirectional flow and thermal stratification.
g. Zone air distribution effectiveness of 1.0 shall be permitted for systems with a ceiling supply of warm air, provided that supply air temperature is less than 15° F above space temperature and provided that the 150 foot-per-minute supply air jet reaches to within 4.5 feet of floor level.

403.3.1.3 (Supp) Zone outdoor airflow. The zone outdoor airflow rate (V_{oz}), shall be determined in accordance with Equation 4-2.

$$V_{oz} = V_{bz}/E_z \qquad \textbf{(Equation 4-2)}$$

403.3.2 (Supp) System outdoor airflow. The outdoor air required to be supplied by each ventilation system shall be determined in accordance with Sections 403.3.2.1 through 403.2.3 as a function of system type and zone outdoor airflow rates.

403.3.2.1 (Supp) Single zone systems. Where one air handler supplies a mixture of outdoor air and recirculated return air to only one zone, the system outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Equation 4-3.

$$V_{ot} = V_{oz} \qquad \textbf{(Equation 4-3)}$$

403.3.2.2 (Supp) 100-percent outdoor air systems. Where one air handler supplies only outdoor air to one or more zones, the system outdoor air intake flow rate (V_{ot}) shall be determined using Equation 4-4.

$$V_{ot} = \sum_{all\ zones} V_{oz} \qquad \textbf{(Equation 4-4)}$$

403.3.2.3 (Supp) Multiple zone recirculating systems. Where one air handler supplies a mixture of outdoor air and recirculated return air to more than one zone, the system outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Sections 403.3.2.3.1 through 403.3.2.3.5.

403.3.2.3.1 (Supp) Primary Outdoor Air Fraction. The primary outdoor air fraction (Zp) shall be determined for each zone in accordance with Equation 4-5.

$$Z_p = V_{oz}/V_{pz} \qquad \textbf{(Equation 4-5)}$$

where:

V_{pz} = Primary airflow: The airflow rate supplied to the zone from the air handling unit at which the outdoor air intake is located. It includes outdoor intake air and recirculated air from that air-handling unit but does not include air transferred or air recirculated to the zone by other means. For design purposes, *Vpz* shall be the zone design primary airflow rate, except for zones with variable air volume supply and *Vpz* shall be the lowest expected primary airflow rate to the zone when it is fully occupied.

403.3.2.3.2 (Supp) System ventilation efficiency. The system ventilation efficiency (E_v) shall be determined using Table 403.3.2.3.2 or Appendix A of ASHRAE 62.1.

TABLE 403.3.2.3.2 (Supp)
SYSTEM VENTILATION EFFICIENCY

Max (Z_p)	E_v
≤ 0.15	1.0
≤ 0.25	0.9
≤ 0.35	0.8
≤ 0.45	0.7
≤ 0.55	0.6
≤ 0.65	0.5
≤ 0.75	0.4
> 0.75	0.3

a. *Max* (Z_p) is the largest value of Z_p calculated using Equation 4-5 among all the zones served by the system.
b. Interpolating between table values shall be permitted.

403.3.2.3.3 (Supp) Uncorrected outdoor air intake. The uncorrected outdoor air intake flow rate (V_{ou}) shall be determined in accordance with Equation 4-7.

$$V_{ou} = D \sum_{all\ zones} R_p P_z + \sum_{all\ zones} R_a A_z \qquad \textbf{(Equation 4-7)}$$

where:

D = Occupant diversity: the ratio of the *system population* to the sum of the zone populations, determined in accordance with Equation 4-8.

$$D = P_s / \sum_{all\ zones} P_z \qquad \textbf{(Equation 4-8)}$$

where:

P_s = System population: The total number of occupants in the area served by the system. For design purposes, P_s shall be the maximum number of occupants expected to be concurrently in all zones served by the system.

403.3.2.3.4 (Supp) Outdoor air intake flow rate. The outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Equation 4-9.

$$V_{ot} = V_{ou} / E_v \qquad \textbf{(Equation 4-9)}$$

403.6 (Supp) Variable air volume system control. Variable air volume air distribution systems, other than those designed to supply only 100-percent outdoor air, shall be provided with controls to regulate the flow of outdoor air. Such control system shall be designed to maintain the flow rate of outdoor air at a rate of not less than that required by Section 403.3 over the entire range of supply air operating rates.

403.7 (Supp) Balancing. The ventilation air distribution system shall be provided with means to adjust the system to achieve at least the minimum ventilation airflow rate as required by Sections 403.3 and 403.4. Ventilation systems shall be balanced by an approved method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.4.

TABLE 403.3 (Supp)
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	People Outdoor Airflow Rate in Breathing Zone Cfm/person	Area Outdoor Airflow Rate In Breathing Zone Ra cfm/ft^{2a}	Default Occupant Density #/1000 ft^{2a}	Exhaust Airflow Rate Cfm/ft^{2a}
Correctional facilities				
Cells				
without plumbing fixtures	5	0.12	25	–
with plumbing fixtures[g]	5	0.12	25	1.0
Dining halls (See Food and Beverage Service)	–	–	–	–
Guard stations	5	0.06	15	–
Day room	5	0.06	30	–
Booking/waiting	7.5	0.06	50	–
Dry Cleaners, laundries				
Coin-operated dry cleaner	15	–	20	–
Coin-operated laundries	7.5	0.06	20	–
Commercial dry cleaner	30	–	30	–
Commercial laundry	25	–	10	–
Storage, pick up	7.5	.12	30	–
Education				
Auditoriums	5	0.06	150	–
Corridors (See Public Spaces)	–	–	–	–
Media center	10	0.12	25	
Sports locker rooms[g]	–	–	–	0.5
Music/theater/dance	10	0.06	35	–
Smoking lounges[b]	60		70	–
Daycare (through age 4)	10	0.18	25	–
Classrooms (ages 5-8)	10	0.12	25	–
Classrooms (age 9 plus)	10	0.12	35	–
Lecture classroom	7.5	0.06	65	–
Lecture hall (fixed seats)	7.5	0.06	150	–
Art classroom[g]	10	0.18	20	0.7
Science laboratories[g]	10	0.18	25	1.0
Wood/metal shops[g]	10	0.18	20	0.5
Computer lab	10	0.12	25	–
Multi-use assembly	7.5	0.06	100	–
Locker/dressing rooms[g]	–	–	–	0.25
Food and beverage service				
Bars, cocktail lounges	7.5	0.18	100	–
Cafeteria, fast food	7.5	0.18	100	–
Dining rooms	7.5	0.18	70	–
Kitchens (cooking)[b]	–	–	–	0.7
Hospitals, nursing and convalescent homes				
Autopsy rooms[b]		–	–	0.5
Medical procedure rooms	15	–	20	–
Operating rooms	30	–	20	–
Patient rooms	25	–	10	–
Physical therapy	15	–	20	–
Recovery and ICU	15	–	20	–
Hotels, motels, resorts and dormitories				
Multi-purpose assembly	5	0.06	120	–
Bathrooms/Toilet – private[g]	–	–	–	25/50[f]
Bedroom/living room	5	0.06	10	–
Conference/meeting	5	0.06	50	–
Dormitory sleeping areas	5	0.06	20	–
Gambling casinos	7.5	0.18	120	–
Lobbies/pre-function	7.5	0.06	30	–
Offices				
Conference rooms	5	0.06	50	–
Office spaces	5	0.06	5	–
Reception areas	5	0.06	30	–
Telephone/data entry	5	0.06	60	–
Main entry lobbies	5	0.06	10	–
Private dwellings, single and Multiple				
Garages, common for multiple units[b]	-	-	-	0.75
Garages, separate for each dwelling[b]	-	-	-	100 cfm per car
Kitchens[b]	-	-	-	25/100[f]
Living areas[e]	0.35 ACH but not less than 15 cfm/person	-	Based upon number of bedrooms.	-

Toilet rooms and bathrooms[g]	-		first bedroom 2; each additional bedroom: 1	20/50[f]
Public spaces				
Corridors	=	0.06	=	=
Elevator car	=	-	-	1.0
Shower room (per shower head)[g]	-	-	-	50/20[f]
Smoking lounges[b]	60	-	70	-
Toilet rooms – public[g]	-	-	-	50/70[e]
Places of religious worship	5	0.06	120	
Courtrooms	5	0.06	70	
Legislative chambers	5	0.06	50	
Libraries	5	0.12	10	
Museums (children's)	7.5	0.12	40	
Museums/galleries	7.5	0.06	40	
Retail stores, sales floors and Showroom floors				
Sales (except as below)	7.5	0.12	15	=
Dressing rooms	=	=	=	0.25
Mall common areas	7.5	0.06	40	=
Shipping and receiving	=	0.12	=	=
Smoking lounges[b]	60	=	70	=
Storage rooms	=	0.12	=	=
Warehouses (See Storage)	=	=	=	=
Specialty shops				
Automotive motor fuel dispensing stations[b]	=	=	=	1.5
Barber	7.5	0.06	25	0.5
Beauty and nail salons[b, i]	20	0.12	25	0.6
Embalming room[b]				2.0
Pet shops (animal areas)[b]	7.5	0.18	10	0.9
Supermarkets	7.5	0.06	8	=
Sports and amusement				
Disco/dance floors	20	0.06	100	=
Bowling alleys (seating areas)	10	0.12	40	=
Game arcades	7.5	0.18	20	=
Ice arenas without combustion engines	=	0.30	=	0.5
Gym, stadium, arena (play area)	=	0.30	=	-
Spectator areas	7.5	0.06	150	=
Swimming pools (pool and deck area)	=	0.48	=	=
Health club/aerobics room	20	0.06	40	=
Health club/weight room	20	0.06	10	=
Storage				
Repair garages, enclosed parking garages[b, d]	=	=	=	0.75
Warehouses	=	0.06	=	=
Theaters				
Auditoriums (See Education)	-	-	-	-
Lobbies	5	0.06	150	=
Stages, studios	10	0.06	70	=
Ticket booths	5	0.06	60	=
Transportation				
Platforms	7.5	0.06	100	=
Transportation waiting	7.5	0.06	100	=
Workrooms				
Bank vaults/safe deposit	5	0.06	5	
Darkrooms	=	=	=	1.0
Copy, printing rooms	5	0.06	4	0.5
Meat processing[c]	15	=	10	=
Pharmacy (prep. area)	5	0.18	10	=
Photo studios	5	0.12	10	=
Computer (without printing)	5	0.06	4	=

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

a. Based upon net occupiable floor area

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50° F are not covered by these requirements unless the occupancy is continuous.

~~d. Ventilation systems in enclosed parking garages shall comply with Section 404.~~
~~e. Rates are per water closet or urinal. The higher rate shall be provided where periods of heavy use are expected to occur, such as, toilets in theaters, schools, and sports facilities. The lower rate shall be permitted where periods of heavy use are not expected.~~
~~f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted where the exhaust system is designed to operate continuously during normal hours of use.~~
~~g. Mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces (see Section 403.2.1, Items 2 and 4).~~
~~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.~~

403.3 Ventilation

403.3.1 General. Enclosed portions of buildings and structures, other than the locations specified in Sections 403.3 through 403.7, shall be provided with natural ventilation by means of openable exterior openings with an area of not less than 1/20 of the total floor area of the enclosed portion of the building or structure or shall be provided with a mechanically operated ventilation system. Mechanically operated ventilation systems shall be capable of supplying ventilation air in accordance with Table 403.3 during such time as the building or space is occupied. Outdoor air and exhaust systems shall be permitted to be closed off before and after normal operating hours.

403.3.2 Toilet rooms. Toilet rooms shall be provided with a fully openable exterior window at least 3 square feet (0.27 m^2) in area; a vertical duct not less than 100 square inches (0.064 516 m^2) in area for the first toilet, with 50 additional square inches (0.032 m^2) for each additional toilet; or a mechanically operated exhaust system capable of exhausting 50 cubic feet of air per minute (23.6 L/s) for each water closet or urinal installed in the toilet room. Such systems shall be connected directly to the outdoors, and the point of discharge shall be at least 3 feet (914 mm) from any openable window.

403.3.3 Ventilation in hazardous locations. Rooms, areas or spaces in which explosive, corrosive, combustible, flammable, or highly toxic dusts, mists, fumes, vapors or gases are capable of being emitted as the result of the processing, use, handling, or storage of materials shall be mechanically ventilated as required by the *International Fire Code* and other provisions of this code.

Emissions generated at work stations shall be confined to the area in which they are generated as specified in the *International* Fire Code and other provisions of this code.

Supply and exhaust openings shall be in accordance with this code. Exhaust air contaminated by highly toxic material shall be treated in accordance with the *International Fire Code*.

403.3.4 Group B occupancies. In Groups B, F, M, and S occupancies where Class I, II or III-A liquids are used, mechanical exhaust shall be provided to produce not less than six air changes per hour. Such mechanical exhaust shall be taken from a point at or near the floor level.

403.3.5 Group S parking garages. In parking garages, other than open parking garages as defined in the *International Building Code*, that are used for storing or handling of automobiles operating under their own power and on loading platforms in bus terminals, ventilation shall be provided at an exhaust rate of not less than 0.75 cubic feet per minute per square foot (0.354 L/s/m^2) of gross floor area. An alternate ventilation system shall be designed to exhaust not less than 14,000 cfm (6608 L/s) for each operating vehicle and shall be based on the anticipated instantaneous movement rate of vehicles, but not less than 2.5 percent of the garage capacity or one vehicle. Whichever method is used, automatic carbon monoxide-sensing devices shall be permitted to be employed to modulate the ventilation system to maintain a maximum average concentration of carbon monoxide of 50 parts per million during any eight-hour period, with a maximum concentration not greater than 200 parts per million for a period not exceeding one hour.

> **Exception:** In repair garages and motor vehicle fuel-dispensing stations without lubrication pits, in storage garages, and in aircraft hangars, the ventilation system shall be permitted to be omitted where the building is supplied with unobstructed openings to the outdoors that will provide the necessary ventilation.

Connecting offices, waiting rooms, ticket booths and similar uses shall be supplied with conditioned air under positive pressure.

403.3.6 Group S repair garages. In buildings used for the repair or handling of motor vehicles operating under their own power, mechanical ventilation shall be provided at an exhaust rate of not less than 1.0 cfm per square foot (5.1 L/s/m^2) of floor area. Each engine repair stall shall be equipped with a source capture system in accordance with

Section 502.14. Ducts over 10 feet (3048 mm) in length shall mechanically exhaust 300 cfm (141.6 L/s). Connecting offices and waiting rooms shall be supplied with conditioned air under positive pressure.

Exception: In repair garages and aircraft hangars, such ventilation equipment shall be permitted to be omitted where the building is supplied with unobstructed openings to the outdoors that are distributed and sized to provide the necessary ventilation. Doors providing cross ventilation shall be an acceptable alternative to this requirement.

403.3.7 Group R occupancies. Guest rooms and bathrooms in Group R occupancies shall comply with Sections 403.3.7.1 and 403.3.7.2.

403.3.7.1 Guest rooms. Each guest room and other habitable room within a dwelling unit or congregate residence shall be provided with natural ventilation by means of openable exterior openings having an area of not less than 1/20 of the floor area of such room or 5 square feet (0.46 m^2), whichever is greater.

Exception: The openable exterior openings shall not be required where a mechanical ventilation system that is capable of providing quantities in accordance with Table 403.3 is provided.

403.3.7.2 Bathrooms, etc. Each bathroom, water closet compartment, laundry room, or similar room within a dwelling unit shall be provided with natural ventilation by means of openable exterior openings having an area not less than 1/20 of the floor area of such rooms with a minimum of 1-1/2 square feet (0.14 m^2), whichever is greater.

Exceptions:

1. Laundry rooms in Group R-3 occupancies or laundry rooms within dwelling units in Group R-2 occupancies.
2. In bathrooms containing a bathtub, shower or combination thereof, laundry rooms, and similar rooms, a mechanical ventilation system connected directly to the outdoors capable of providing exhaust air quantities in accordance with Table 403.3 shall be permitted to be provided. Such systems shall be connected directly to the outdoors, and the point of discharge shall be at least 3 feet (914 mm) from any opening that allows air entry into occupied portions of the building.
3. Bathrooms that contain only a water closet, lavatory or combination thereof and similar rooms shall be permitted to be ventilated with an approved mechanical recirculating fan or similar device designed to remove odors from the air.

TABLE 403.3
OUTDOOR AIR REQUIREMENTS FOR VENTILATION[h]

OCCUPANCY[a]	**OUTDOOR VENTILATION AIR** (cfm per square foot of area unless noted)2 0.472 for L/s per m^2	
Group A Occupancies		
Applications similar to:		
Food and Beverage Service		
Bars, cocktail lounge[i]	1.00	
Cafeteria, fast food[i]	0.50	
Dining rooms[i]	0.50	
Kitchens (cooking)[c]	0.30	
Sports and Amusement		
Assembly rooms	0.50[f]	
Ballrooms and discos		
Where smoking is permitted[i]		1.67
Where smoking is prohibited		0.50
Bowling alleys (seating areas)[i]		1.67
Conference rooms	0.20	
Game rooms[i]	0.83	
Ice arenas	0.10 (playing areas)	
Playing floors (gymnasium)	0.30	
Spectator areas	0.50[f]	

Swimming pools (pool and deck area)	0.50
Theaters	
Auditorium	0.50[f]
Lobbies	0.18
Stages, studios	0.50
Ticket booths	0.25
Transportation	
Platforms	1.00
Waiting rooms	0.20

Group B Occupancies

Applications similar to:	
Offices	
Bank vaults:	
Greater than 200 square feet	0.08
Less than 200 square feet	0.00
Conference rooms	0.20
Corridors and utilities	0.05
Duplicating, printing areas	0.20
Locker and dressing rooms	0.20
Office spaces	0.08
Pharmacies	0.10
Photo studios	0.10
Public restrooms (per water closet or urinal)	50 cfm/water closet or urinal[d]
Reception areas	0.20
Smoking lounges	1.00
Telecommunication centers and data entry spaces	0.25

Group E Occupancies

Applications similar to:	
Education	
Auditoriums	0.50[f]
Classrooms	0.22
Corridors	0.00
Laboratories & Art rooms	0.25
Libraries	0.15
Locker rooms	0.25 exhaust
Music rooms	0.30
Smoking lounges[i]	1.00
Training shop (wood, metal, and auto training)	0.25

Group F Occupancies

Applications similar to:	
Dry Cleaners, Laundries	
Coin-operated dry cleaners	0.30
Coin-operated laundries	0.30
Commercial dry cleaners and storage	0.90
Commercial laundries	0.25
Pick-up areas	0.12

Group I Occupancies

Applications similar to:	
Hospitals, Nursing and Convalescent Homes	
Autopsy rooms	0.50[d]
Medical procedure rooms	0.30
Operating rooms	0.60
Patient rooms	0.25
Physical therapy rooms	0.30
Recovery and ICU rooms	0.30
Correctional facilities	
Cells & Day rooms	10 cfm/person
Dining halls	20 cfm/person
Guard stations	0.20
Public restrooms	50 cfm/water closet or urinal[d]

Group M Occupancies

Applications similar to:

Stores, Sales Floors and Showroom Floors	
Basement and street levels	0.10
Upper levels	0.10
Dressing rooms	0.10
Malls and arcades	0.10
Shipping and receiving areas	0.10
Smoking lounges[i]	1.00
Storage rooms	0.10
Warehouse	0.05
Specialty Shops	
Nail Salons	200 CFM/Station + 0.22 CFM/Ft^2 (area of salon)
Barber shops	0.22
Beauty shops	0.22
Clothiers	0.12
Drug stores	0.10
Fabric stores	0.12
Florists	0.10
Food stores	0.08
Furniture stores	0.10
Hardware stores	0.10
Pet shops	
Animal housing areas	1.00
Other areas	0.10
Reducing salons & Exercise rooms	0.25

Group R Occupancies

Hotels, motels, resorts, dormitories	
Assembly rooms	0.50[f]
Bedrooms	30 cfm/room[e]
Conference rooms	0.20
Dormitory sleeping rooms	15 cfm/bed[e]
Living rooms	30 cfm/room[e]
Lobbies	0.15
Private bathrooms (intermittent exhaust)	35 cfm/room[e]
Apartment Houses and Dwellings and Lodging Houses	
Individual Dwelling Units, Lodging Houses	
Bathrooms (intermittent exhaust) or	50 cfm/room[d,e]
(continuous exhaust)	20 cfm/room[d,e]
Kitchens (intermittent exhaust) or	100 cfm/room[d,e]
(continuous exhaust)	25 cfm/room[d,e]
Living areas	0.30[g]

Group S Occupancies

Applications similar to:	
Enclosed parking garages	0.75

a. Applications might not be unique to a single occupancy group. Where specific use is not listed, judgment as to similarity shall be by the code official.

b. Based on net occupiable space. The minimum amount of outdoor air supplied during occupancy shall be permitted to be based on the rate per square foot (m^2) of floor area indicated in Table 403-1 or cubic feet per minute (L/s) per person in accordance with nationally recognized standards. Controls shall be permitted to adjust outdoor air ventilation rates to provide equivalent rates per person under different conditions of occupancy.

c. The sum of the outdoor and transfer air from adjacent spaces shall be sufficient to provide an exhaust rate of not less than 0.50 cubic feet per minute per square foot.

d. Normally supplied by transfer air with local mechanical exhaust with no recirculation.

e. Independent of room size.

f. Where there is fixed seating, use 6 cfm/seat.

g. Air changes per hour, but not less than 15 cubic feet per minute (7.08 L/s) per person. Occupancy shall be based on the number of bedrooms: first bedroom = two persons, each additional bedroom = one person. Air quantities from natural ventilation shall be considered adequate if operable window option is provided.

h. Conformance to applicable state and federal licensing standards shall be acceptable in complying with this code.

i. Smoking permitted, non smoking rates can be ½ the required rate.

2. Delete and substitute as follows:

~~**404.2 (Supp) Minimum ventilation.** Automatic operation of the system shall not reduce the ventilation airflow rate below 0.05 cfm per square foot (0.00025 $m^3/s \cdot m^2$) of the floor area and the system shall be capable of producing a ventilation airflow rate of 0.75 cfm per square foot (0.0076$m^3/s \cdot m^2$) of floor area.~~

404.2 Demand controlled ventilation. Automatic operation of outdoor air systems from CO_2 sensors sensing CO_2 levels, which are an indication of occupancy, shall be permitted. Controls capable of automatic operation of the system shall be provided, utilizing CO_2 monitoring to increase outdoor airflow to a space where the CO_2 level in the space rises to more than 1200 ppm above the CO_2 level in the outdoor air. Outdoor airflow to any occupied area shall not be reduced such that the space pressure becomes negative relative to outdoors.

3. Delete definitions without substitution:

SECTION 202
GENERAL DEFINITIONS

~~**BREATHING ZONE. (Supp)** The region within an occupied space between planes 3 and 72 inches (75 and 1800 mm) above the floor and more than 2 feet (600 mm) from the walls of the space or from fixed air-conditioning equipment.~~

~~**NET OCCUPIABLE FLOOR AREA. (Supp)** The floor area of an occupiable space defined by the inside surfaces of its walls but excluding shafts, column enclosures and other permanently enclosed, inaccessible and unoccupiable areas. Obstructions in the space such as furnishings, display or storage racks and other obstructions, whether temporary or permanent, shall not be deducted from the space area.~~

~~**OCCUPIABLE SPACE. (Supp)** An enclosed space intended for human activities, excluding those spaces intended primarily for other purposes, such as storage rooms and equipment rooms, that are only intended to be occupied occasionally and for short periods of time.~~

~~**ZONE. (Supp)** One occupiable space or several occupiable spaces with similar occupancy classification (see Table 403.3), occupant density, zone air distribution effectiveness and zone primary airflow rate per unit area.~~

Reason: These changes will simplify the code by providing ventilation requirements that are easily understood by system designers, contractors, and code officials. The major portion of this change is the ventilation code used by the City of Houston, Texas. It has been in force since 1996 and there has been no evidence of adverse health and comfort effects to building occupants using these ventilation rates.

The ventilation criteria now used in Section 403.3 from ASHRAE Standard 62.1 are much too complicated to expect reasonable compliance and enforcement and the rates are not true minimums. The added requirements for air distribution effectiveness and system ventilation efficiency will result in more complexity than necessary and contradictions between summer and winter conditions, varying supply air temperatures, and the configuration of the air supply, return, and exhaust systems. Measurement and control of these criteria will be difficult and expensive, with little actual or perceived benefit. Even these proposed rates are viewed by some of the proposers as being above true minimums. The occupancy groups match the 2006 IBC.

This grouping of occupancies and the recommended code change is both an improvement and clarification over the present code that incorporates many of the sections of ASHRAE Standard 62.1 that is confusing to designers, contractors, and code officials. Most indoor air quality complaints are because of mold. These proposed ventilation rates simplify the design and operation of the outdoor air dehumidification systems required to minimize the potential for mold. The proposed ventilation rates have been proven to be more than satisfactory in practice over many years.

Section 404.3 has been added to facilitate and clarify use of carbon dioxide (CO_2) sensors for demand controlled ventilation. CO_2 sensors are currently used in many jurisdictions with little code direction. The 1200 part per million (PPM) above outdoor setting equates to approximately 8.5 CFM/person, assuming an activity level of 1.2 MET and a CO_2 generation of 0.31 L/min. This setting can be adjusted to suit special applications, but the 1200 ppm setting is recommended as a minimum level for most applications where demand controlled ventilation is used.

Cost Impact: Contrary to the original justification, the new 2007 IMC ventilation changes, (or even using the full ASHRAE 62.1 standard) ventilation systems are now more costly to design, more costly to enforce, more costly to build, and more costly to operate. This is because the design computations are far more complex and extensive, the outdoor air and control requirements are greater, and the resulting cost of construction and operation are higher. The actual savings are dependent on the local climate and building operation. In hot and humid climates like Houston, reducing outdoor air quantities to the requirements in this table results in savings of approximately 1 kWh per 100 cfm at peak loads or an annual energy savings of approximately 2500 to 3000 kWh per 100 cfm of outdoor air reduction. In cold climates, these ventilation rates will result in lower energy and equipment costs for both heating and humidification. The Gulf Coast, the southern half of the Atlantic coasts, the Mississippi Valley south of the Ohio River, and other humid climates along with most cold climates will also benefit from lower costs with this code change.

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

M26–07/08
404.1 (New)

Proponent: James Harper, City of Omaha, representing Nebraskaland Conference of Building Officials and Inspectors.

Add new text as follows:

404.1 General. Enclosed parking garages shall be provided with mechanical ventilation as prescribed in this chapter.

(Renumber subsequent sections)

Reason: Currently the code is silent if ventilation is even required. This change specifies that enclosed parking garages must have mechanical ventilation. Mechanical ventilation of private garages similar to those in conjunction with dwellings is impractical to enforce. Presently, a double car garage is required to have mechanical ventilation. Using an exception for U occupancies sets a limit on how large an enclosed garage can get without ventilation.

Cost Impact: Reduces costs by requiring fewer mechanical ventilation systems be installed in private garages.

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

M27–07/08
501.2.1

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

Revise as follows:

501.2.1 (Supp) Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. Environmental air duct exhaust terminations shall comply with Section 401.4.

   Exception: Exhaust from bathrooms and kitchens in residential dwellings complying with Section 401.4.1.

4. For specific systems see the following sections:
   4.1. Clothes dryer exhaust, Section 504.4
   4.2. Kitchen hoods and other kitchen exhaust equipment, Sections 506.3.12, 506.4 and 506.5
   4.3. Dust, stock and refuse conveying systems, Section 511.2
   4.4. Subslab soil exhaust systems, Section 512.4, and
   4.5. Smoke control systems, Section 513.10.3
   4.6. Refrigeration machinery room discharge, Section 1105.6.1

Reason: Section 1105.6.1 steers toward Chapter 5 in general, but the general termination requirements in item 4 don't apply to the specific requirement of 1105.6.1. This creates confusion as to which termination point should be used. Is it 20-feet to property lines and 20-feet to openings, or is it 30–feet to property lines and 10-feet to openings. In this case, the specific requirement should rule and referencing this section here will eliminate any confusion as to which termination point prevails.

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

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

M28–07/08
502.20 (New), Table 502.20 (New)

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

Add new text and table as follows:

502.20 Exhaust systems required. Where not specified elsewhere in this chapter, exhaust systems shall be provided and shall have the minimum exhaust rates as prescribed in Table 502.20.

TABLE 502.20
MINIMUM EXHAUST RATES

Occupancy Category	Exhaust Rate cfm/unit	Exhaust Rate cfm/ft^2	Notes	Exhaust Rate L/s-unit	Exhaust Rate L/s-m^2	Air Class
Arenas	-	0.50	b	-	-	1
Art classrooms	-	0.70		-	3.5	2
Auto repair rooms	-	1.50	a	-	7.5	2
Barber shop	-	0.50		-	2.5	2
Beauty and nail salons	-	0.60		-	3.0	2
Cell with toilet	-	1.00		-	5.0	2
Copy, printing rooms	-	0.50		-	2.5	2
Darkrooms	-	1.00		-	5.0	2
Educational science laboratories	-	1.00		-	5.0	2
Janitor closet, trash room, recycle	-	1.00		-	5.0	3
Kitchenettes	-	0.30		--	1.5	2
Kitchen – commercial	-	0.70		--	3.5	2
Locker/dressing rooms	-	0.25		-	1.25	2
Locker rooms	-	0.50		-	2.5	2
Paint spray booths	-	-	f	-	-	4
Parking garages	-	0.75	c	--	3.7	2
Pet shops (animal areas)	-	0.90		-	4.5	2
Refrigerating machinery rooms	-	-	f	-	-	3
Residential kitchens	50/100	-	g	25/50	-	2
Soiled laundry storage rooms	-	1.00	f	-	5.0	3
Storage rooms, chemical	-	1.50	f	-	7.5	4
Toilets – public	50/70	-	d	25/35	-	2
Toilets – private	25/50	-	e	12.5/25	-	2
Woodwork shop/classrooms	-	0.50		-	2.5	2

a. Stands where engines are run shall have exhaust systems that directly connect to the engine exhaust and prevent escape of fumes.

b. Where combustion equipment is intended to be used on the playing surface, additional dilution ventilation or source control shall be provided.

c. Exhaust not required if two or more sides comprise walls that are at least 50% open to the outdoors.
d. Rate is per water closet or urinal. Provide the higher rate where periods of heavy use are expected to occur, such as, toilets in theatres, schools, and sports facilities.
e. Rate is for a toilet room intended to be occupied by one person at a time. For continuous system operation during normal hours of use, the lower rate shall apply. For intermittent use, the higher rate shall apply
f. See other applicable standards for exhaust rate.
g. For continuous system operation, the lower rate shall apply. For intermittent use, the higher rate shall apply.

Reason: This new table is a reprint of Table 6-4 Minimum Exhaust Rates as defined by ANSI/ASHRAE Standard 62.1 -2007 and will enhance the exhaust rates not currently covered by Chapter 5 of the ICC-IMC. These rates have been supported through the ANSI consensus based development of ANSI/ASHRAE Standard 62.1 – 2007 and will augment the previous inclusion of ventilation rates in Chapter 4 provided via ANSI/ASHRAE Standard 62.1 – 2007.

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

Analysis: The classes in the air class column are not defined. How does the table relate to or coordinate with Table 403.3? What standards are applicable in Note "f"?

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

M29–07/08

[F] 502.4, [F] 502.4.1, [F] 502.4.2, [F] 502.5, [F] 502.5.1, [F] 502.5.2, [F] 407 (New), [F] 407.1 (New), [F] 407.2 (New), [F] 407.2.1 (New), [F] 407.2.2 (New), [F] 407.2.3, [F] 407.3, [F] 407.3.1 (New), [F] 407.3.2 (New)

Proponent: Stephen McCluer, APC-MGE

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

1. Delete without substitution:

~~**[F] 502.4 Stationary storage battery systems.** Stationary storage battery systems, as regulated by Section 608 of the *International Fire Code*, shall be provided with ventilation in accordance with this chapter and Section 502.4.1 or 502.4.2.~~

~~**Exception:** Lithium-ion batteries shall not require ventilation.~~

~~**[F] 502.4.1 Hydrogen limit in rooms.** For flooded lead acid, flooded nickel cadmium and VRLA batteries, the ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room.~~

~~**[F] 502.4.2 Ventilation rate in rooms.** Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (cfm/ft^2) [0.00508 m^3/(s •m^2)] of floor area of the room.~~

~~**[F] 502.5 Valve-regulated lead-acid batteries in cabinets.** Valve-regulated lead-acid (VRLA) batteries installed in cabinets, as regulated by Section 608.6.2 of the *International Fire Code*, shall be provided with ventilation in accordance with Section 502.5.1 or 502.5.2.~~

~~**[F] 502.5.1 Hydrogen limit in cabinets.** The cabinet ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the cabinet during the worst-case event of simultaneous boost charging of all batteries in the cabinet.~~

~~**[F] 502.5.2 Ventilation rate in cabinets.** Continuous cabinet ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (cfm/ft.^{2}) [0.00508 m^3/(s • m^2)] of the floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required by Section 502.4.1 or 502.4.2.~~

2. Add new text as follows:

SECTION 407
STATIONARY BATTERY SYSTEMS

[F] 407.1 General. Stationary storage battery systems, as regulated by Section 608 of the *International Fire Code*, shall be provided with ventilation in accordance with this chapter and Section 407.2 or 407.3.

[F] 407.2 Room ventilation. For flooded lead-acid, flooded nickel-cadmium, nickel metal hydride, and valve-regulated lead-acid (VRLA) batteries, the room ventilation system shall be designed in accordance with Section 407.2.1 or 407.2.2, and with Section 407.2.3

Exception: Lithium-ion and lithium metal polymer batteries shall not require ventilation beyond what is normally required for the occupancy in accordance with Section 401 and Section 402 or 403 of this code, as applicable.

[F] 407.2.1 Hydrogen ventilation in rooms. The room ventilation system shall limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room within an eight hour period and under the worst case condition of either recharge following a discharge, or equalize charging, if capability exists, whichever is the higher voltage.

[F] 407.2.2 Ventilation rate in rooms. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (1 cfm/sq ft) [0.00508 cu m/ sec / sq m] of floor area of the room.

[F] 407.2.3 Supervision. Mechanical ventilation systems shall be supervised by an approved central, proprietary, or remote station service, or shall initiate an audible and visual signal at a constantly attended on-site location.

[F] 407.3 Cabinet ventilation. Where valve-regulated lead-acid (VRLA) batteries are installed inside a cabinet, as regulated by Section 608.6.2 of the *International Fire Code*, the cabinet shall be provided with ventilation in accordance with Section 407.3.1 or 407.3.2.

[F] 407.3.1 Hydrogen limit in cabinets. The cabinet ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the cabinet during the worst-case condition of either recharge following a discharge, or equalize charging, if capability exists, whichever is the higher voltage.

[F] 407.3.2 Ventilation rate in cabinets. Continuous cabinet ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (1 cfm/sq ft) or [0.00508 cu m/sec/sq m] of the floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required by Section 407.2.

Reason: The existing requirements for battery system ventilation are not in the Ventilation chapter of the *International Mechanical Code*; They are inappropriately placed in the Exhaust chapter. This proposal would move batteries to a new section in Chapter 4.
This new section correlates with Section 608 of the *International Fire Code* in the 2007 Supplement.

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

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

M30–07/08

504.6, 504.6.1, 504.6.2, 504.6.3 (New), 504.6.4 (New), 504.6.4.1 (New), 504.6.4.2 (New), 504.6.4.3 (New), 504.6.5 (New), Table 504.6.5 (New), 504.6.6 (New), 504.6.7 (New) [IFGC [M] 614.6, [M] 614.6.1, [M] 614.6.2, [M] 614.6 through [M] 614.6.7 (New)]; IRC M1502.3, M1502.3.1 (New), M1502.3.2 (New), M1502.3.3 (New), M1502.3.4 (New), M1502.3.4.1 (New), M1502.3.4.2 (New), M1502.3.4.3 (New), M1502.3.5 (New), Table M1502.3.5 (New), M1502.3.6 (New), M1502.3.7 (New), M1502.4, M1502.5, M1502.6, M1502.3 (New)

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing In-O-Vate Technologies

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Delete and substitute as follows:

~~**504.6 Domestic clothes dryer ducts.** Exhaust ducts for domestic clothes dryers shall be constructed of metal and shall have a smooth interior finish. The exhaust duct shall be a minimum nominal size of 4 inches (102 mm) in diameter. The entire exhaust system shall be supported and secured in place. The male end of the duct at overlapped duct joints shall extend in the direction of airflow. Clothes dryer transition ducts used to connect the appliance to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm)and shall be listed and labeled for the application. Transition ducts shall not be concealed within construction.~~

~~**504.6.1 (Supp) Maximum length.** The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet (7620 mm) from the dryer location to the outlet terminal. The maximum length of the duct shall be reduced 2 1/2 feet (762 mm) for each 45 degree (0.79 rad) bend and 5 feet (1524 mm) for each 90 degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.~~

> ~~**Exception:** Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for such dryer are provided to the code official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions. Where exhaust ducts are installed in concealed locations, the developed length of the exhaust duct system shall be indicated by permanent labels or tags installed in an observable location.~~

~~**504.6.2 Rough-in required.** Where a compartment or space for a domestic clothes dryer is provided, an exhaust duct system shall be installed in accordance with Sections 504.6 and 504.6.1.~~

504.6 (IFGC [M] 614.6) Domestic clothes dryer exhaust ducts. Exhaust ducts for domestic clothes dryers shall conform to the requirements of Sections 504.6.1 through 504.6.7.

504.6.1 (IFGC [M] 614.6.1) Material and size. Exhaust ducts shall have a smooth interior finish and shall be constructed of metal a minimum 0.016-inch (0.4 mm) thick. The exhaust duct size shall be 4 inches nominal in diameter.

504.6.2 (IFGC [M] 614.6.2) Duct installation. Exhaust ducts shall be supported at 4 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.

504.6.3 (IFGC [M] 614.6.3) Transition ducts. Transition ducts used to connect the dryer to the exhaust duct system shall be a single length that is listed and labeled in accordance with UL 2158A. Transition ducts shall be a maximum of 8 feet in length. Transition ducts shall not be concealed within construction.

504.6.4 (IFGC [M] 614.6.4) 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.

504.6.4.1 (IFGC [M] 614.6.4.1) Specified length. The maximum length of the exhaust duct shall be 25 feet (7620mm) from the connection to the transition duct from the dryer to the outlet terminal.

504.6.4.2 (IFGC [M] 614.6.4.2) Manufacturer's instructions. The maximum length of the exhaust duct shall be determined by the dryer manufacturer's installation instructions. The code official shall be provided with a copy of the installation instructions for the make and model of the dryer.

504.6.4.3 (IFGC [M] 614.6.4.3) Booster fan. The maximum length of the exhaust duct shall be determined by the booster fan manufacturer's installation instructions. Booster fans shall be listed and labeled for use in dryer exhaust duct systems. The booster fan shall be installed in accordance with the manufacturer's installation instructions.

504.6.5 (IFGC [M] 614.6.5) Exhaust duct length reduction. The maximum length of the exhaust duct shall be reduced in accordance with Table 504.6.5.

TABLE 504.6.5 (IFGC [M] TABLE 614.6.5)
DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH

Dryer Exhaust Duct Fitting Type	Equivalent Length (feet)
4" radius mitered 45 degree elbow	2-1/2
4" radius mitered 90 degree elbow	5
6" radius smooth 45 degree elbow	1
6" radius smooth 90 degree elbow	1-3/4
8" radius smooth 45 degree elbow	1
8" radius smooth 90 degree elbow	1-7/12
10" radius smooth 45 degree elbow	3/4
10" radius smooth 90 degree elbow	1-1/2

504.6.6 (IFGC [M] 614.6.6) Length identification. Where the exhaust duct is concealed within the building construction, the equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet of the exhaust duct connection.

504.6.7 (IFGC [M] 614.6.7) Exhaust duct required. Where facilities for a clothes dryer are provided, an exhaust duct system shall be installed.

PART II – IRC-M

Delete and substitute as follows:

~~**M1502.3 Duct size.** The diameter of the exhaust duct shall be as required by the clothes dryer's listing and the manufacturer's installation instructions.~~

~~**M1502.4 Transition ducts.** Transition ducts shall not be concealed within construction. Flexible transition ducts used to connect the dryer to the exhaust duct system shall be limited to single lengths, not to exceed 8 feet (2438 mm) and shall be listed and labeled in accordance with UL 2158A.~~

~~**M1502.5 Duct construction.** Exhaust ducts shall be constructed of minimum 0.016 inch thick (0.4 mm) rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Exhaust ducts shall not be connected with sheet-metal screws or fastening means which extend into the duct.~~

~~**M1502.6 (Supp) Duct length.** The maximum length of a clothes dryer exhaust duct shall not exceed 35 feet (10 668 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45 degree (0.8 rad) bend and 5 feet (1524 mm) for each 90 degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.~~

~~**Exceptions:**~~

1. ~~Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for the dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions.~~
2. ~~Where large radius 45 degree (0.8 rad) and 90 degree (1.6 rad) bends are installed, the equivalent length of the clothes dryer exhaust duct for each bend shall be as provided in the fitting manufacturer's installation instructions. The engineering calculation used by the manufacturer of such fittings shall be in accordance with the ASHRAE Fundamentals Handbook.~~

M1502.3 Dryer exhaust ducts. Dryer exhaust ducts shall conform to the requirements of Sections M1502.3.1 through M1502.3.7.

M1502.3.1 Material and size. Exhaust ducts shall have a smooth interior finish and shall be constructed of metal a minimum 0.016-inch (0.4 mm) thick. The exhaust duct size shall be 4 inches nominal in diameter.

M1502.3.2 Duct installation. Exhaust ducts shall be supported at 4 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.

M1502.3.3 Transition duct. Transition ducts used to connect the dryer to the exhaust duct system shall be a single length that is listed and labeled in accordance with UL 2158A. Transition ducts shall be a maximum of 8 feet in length. Transition ducts shall not be concealed within construction.

M1502.3.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections M1502.3.4.1 through M1502.3.4.3.

M1502.3.4.1 Specified length. The maximum length of the exhaust duct shall be 25 feet (7620mm) from the connection to the transition duct from the dryer to the outlet terminal.

M1502.3.4.2 Manufacturer's instructions. The maximum length of the exhaust duct shall be determined by the dryer manufacturer's installation instructions. The code official shall be provided with a copy of the installation instructions for the make and model of the dryer.

M1502.3.4.3 Booster fan. The maximum length of the exhaust duct shall be determined by the booster fan manufacturer's installation instructions. Booster fans shall be listed and labeled for use in dryer exhaust duct systems. The booster fan shall be installed in accordance with the manufacturer's installation instructions.

M1502.3.5 Exhaust duct length reduction. The maximum length of the exhaust duct shall be reduced in accordance with Table M1502.3.5.

TABLE M1502.3.5
DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH

Dryer Exhaust Duct Fitting Type	Equivalent Length (feet)
4" radius mitered 45 degree elbow	2-1/2
4" radius mitered 90 degree elbow	5
6" radius smooth 45 degree elbow	1
6" radius smooth 90 degree elbow	1-3/4
8" radius smooth 45 degree elbow	1
8" radius smooth 90 degree elbow	1-7/12
10" radius smooth 45 degree elbow	3/4
10" radius smooth 90 degree elbow	1-1/2

M1502.3.6 Length identification. Where the exhaust duct is concealed within the building construction, the equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet of the exhaust duct connection.

M1502.3.7 Exhaust duct required. Where facilities for a clothes dryer are provided, an exhaust duct system shall be installed.

Reason (Part I): Over the past few code change cycles, the requirements for dryer exhaust venting has been subject to extensive changes. As a result, the requirements are not properly coordinated. The only feasible means of correctly the text is to provide all new language that is coordinated and contains all of the technically correct requirements.

The initial section establishes that the following section apply to dryer exhaust ducts. The specific requirements are found in the remaining section.

Section 504.6.1 has the requirements for a metal duct as currently found in the code. The change is the requirements for the duct to be 4 inches nominal in diameter. A mm equivalent is not provided since it is a nominal dimension. The current code requires a 4 inch minimum. However, if the duct is increased to 5 inch, the velocity in the exhaust duct drops significantly. The larger duct will not provide the minimum velocity to remove the moisture and any lint that gets into the exhaust duct.

Section 504.6.2 identifies a new requirement for support. Other than having an arbitrary statement, the support is required every 4 feet. This is a typical spacing for supporting a 4 inch duct with insert joints. The other change is to the proper terminology. Male end is no longer used in the profession. It is either an insert end or in the case of threads an outside thread.

Section 504.6.3 simply isolates the requirements for a transition duct. The current text is often missed since it is located within a section of exhaust duct length. The UL standard is currently listed in the Residential Code, but not the Mechanical Code.

Section 504.6.4 provides the three options for maximum exhaust duct length. The first requirement is 25 feet with is the current requirement in the Mechanical Code and Fuel Gas Code. While the Residential Code has a 35 foot limitation, this distance is incorrect. Stack type washers and dryers stipulate a maximum length of 25 feet. Hence, the length cannot be listed as 35 feet.

When the dryer has been specified, the manufacturer's instructions can be used to determine the dryer vent length. This is currently written as an exception; however, it is really an option. The requirements are the same as the current code.

The third viable method is power venting using a dryer booster fan. The new requirement stipulates that the dryer booster fan manufacturer determines the exhaust duct length. The requirements also state that the booster fan must be listed and label; and installed in accordance with the manufacturer's installation instructions. Listed booster fans are a viable method of extending the length of the duct.

Section 504.6.5 lists the equivalent lengths of various fittings. The newer fittings were determined based on an analysis using the ASHRAE and SMACNA fitting tables. The equivalent length table assumes that the current requirement in the code is accurate.

The identification is listed in Section 504.6.6. The new requirement is that the label or tag must be located within 6 feet of the exhaust duct connection. The distance is based on the maximum distance the gas valve can be located from a gas dryer. Since this has been used to determine close proximity for a gas valve, it is appropriate to use the same distance for close proximity for a label.

The last section requires an exhaust duct when a dryer connection is present in a building. This is the intent of the current rough-in section.

Reason (Part II): Over the past few code change cycles, the requirements for dryer exhaust venting has been subject to extensive changes. As a result, the requirements are not properly coordinated. The only feasible means of correctly the text is to provide all new language that is coordinated and contains all of the technically correct requirements.

The initial section establishes that the following section apply to dryer exhaust ducts. The specific requirements are found in the remaining section.

Section M1502.3.1 has the requirements for a metal duct as currently found in the code. The change is the requirements for the duct to be 4 inches nominal in diameter. A mm equivalent is not provided since it is a nominal dimension. The current code requires a 4 inch minimum. However, if the duct is increased to 5 inch, the velocity in the exhaust duct drops significantly. The larger duct will not provide the minimum velocity to remove the moisture and any lint that gets into the exhaust duct.

Section M1502.3.2 identifies a new requirement for support. Other than having an arbitrary statement, the support is required every 4 feet. This is a typical spacing for supporting a 4 inch duct with insert joints. The other change is to the proper terminology. Male end is no longer used in the profession. It is either an insert end or in the case of threads an outside thread.

Section M1502.3.3 simply isolates the requirements for a transition duct. The current text is often missed since it is located within a section of exhaust duct length. The UL standard is currently listed in the Residential Code, but not the Mechanical Code.

Section M1502.3.4 provides the three options for maximum exhaust duct length. The first requirement is 25 feet with is the current requirement in the Mechanical Code and Fuel Gas Code. While the Residential Code has a 35 foot limitation, this distance is incorrect. Stack type washers and dryers stipulate a maximum length of 25 feet. Hence, the length cannot be listed as 35 feet.

When the dryer has been specified, the manufacturer's instructions can be used to determine the dryer vent length. This is currently written as an exception; however, it is really an option. The requirements are the same as the current code.

The third viable method is power venting using a dryer booster fan. The new requirement stipulates that the dryer booster fan manufacturer determines the exhaust duct length. The requirements also state that the booster fan must be listed and label; and installed in accordance with the manufacturer's installation instructions. Listed booster fans are a viable method of extending the length of the duct.

Section M1502.3.5 lists the equivalent lengths of various fittings. The newer fittings were determined based on an analysis using the ASHRAE and SMACNA fitting tables. The equivalent length table assumes that the current requirement in the code is accurate.

The identification is listed in Section M1502.3.6. The new requirement is that the label or tag must be located within 6 feet of the exhaust duct connection. The distance is based on the maximum distance the gas valve can be located from a gas dryer. Since this has been used to determine close proximity for a gas valve, it is appropriate to use the same distance for close proximity for a label.

The last section requires an exhaust duct when a dryer connection is present in a building. This is the intent of the current rough-in section.

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

PART I – IMC

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

PART II – IRC-M

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

M31–07/08

504.6.1 (IFGC [M] 614.6.1)

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

Revise as follows:

504.6.1 (IFGC [M] 614.6.1) (Supp) Maximum length. The maximum length of a clothes dryer exhaust duct shall not exceed ~~25 feet (7620 mm)~~ 35 feet (10668 mm) from the dryer location to the outlet terminal. The maximum length of the duct shall be reduced 2 1/2 feet (762 mm) for each 45 degree (0.79 rad) bend and 5 feet (1524 mm) for each 90 degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exception: Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for such dryer are provided to the code official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions. Where exhaust ducts are installed in concealed locations, the developed length of the exhaust duct system shall be indicated by permanent labels or tags installed in an observable location.

Reason: This section is outdated and overly restrictive when compared to the dryers being built today. The distances permitted by the manufacturers far exceed the distances permitted by the code. By permitting the longer lengths, greater flexibility is achieved in laundry-room placement with-in the building. This will also help in eliminating the use of booster fans which could affect drying cycles. Following are some examples of allowable dryer lengths by various manufacturers extracted from their instructions. Also included are some older unit lengths, all of which are at least 15 years old. The committee passed this last cycle overwhelmingly but was narrowly defeated by the membership for the fear that there may be a machine that would not comply with the longer length. These machines are being removed from service as time goes on in favor of more efficient machines. The analogy of (If keeping this dimension artificially low would save the life of just one dryer, wouldn't it be worth it?) The answer would be NO. The IRC committee approved this last cycle and it was not challenged. It is very important the two books read the same.

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Maytag dryers:
65 feet with 0 elbows
54 feet with 1 elbow
44 feet with 2 elbows
36 feet with 3 elbows
28 feet with 4 elbows

Amana/ Speed Queen dryers
44 feet with 0 elbows
34 feet with 1 elbows
26 feet with 2 elbows
20 feet with 3 elbows

OLDER MODELS:
Maytag, 1990
50 feet with 0 elbows
42 feet with 1 elbow
34 feet with 2 elbows
26 feet with 3 elbows

Whirlpool dryers
64 feet with 0 elbows
54 feet with 1 elbow
44 feet with 2 elbows
34 feet with 3 elbows
27 feet with 4 elbows

Fridgidare / Westinghouse / Tappen / Gibson
60 feet with 0 elbows
52 feet with 1 elbow
44 feet with 2 elbows
32 feet with 3 elbows

Whirlpool, 1991
58 feet with 0 elbows
48 feet with 1 elbow
38 feet with 2 elbows
29 feet with 3 elbows
21 feet with 4 elbows

Kenmore dryers
64 feet with 0 elbows
54 feet with 1 elbow
44 feet with 2 elbows
34 feet with 3 elbows
27 feet with 4 elbows

Magic Chef/Admiral/Norge
45 feet with 0 elbows
35 with 1 elbows
25 with 2 elbows

Kenmore, 1988
22 feet with 3 elbows

General Electric dryers:
90 feet with 0 elbows
60 feet with 1 elbow
45 feet with 2 elbows
35 feet with 3 elbows

Camco/Moffat/McClary
45 feet with 0 elbows
35 feet with 1 elbow
25 feet with 2 elbows

Throm
55 feet with 0 elbows
47 feet with 1 elbow
41 feet with 2 elbows
30 feet with 3 elbows
22 feet with 4 elbows

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

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

M32–07/08

504.6.1, Table 504.6.1 (New); IRC M1502.6, Table M1502.6 (New); (IFGC [M] 614.6.1, Table [M] 614.6.1 (New)

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing In-O-Vate Technologies

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

504.6.1 (IFGC [M] 614.6.1) Maximum length. (Supp) The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet (7620 mm) from the dryer location to the outlet terminal. The maximum length of the duct shall be reduced in accordance with Table 504.6.1 ~~2-1/2 feet (762 mm) for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend~~. The maximum length of the exhaust duct does not include the transition duct.

Exception: Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for such dryer are provided to the code official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions. Where exhaust ducts are installed in concealed locations, the developed length of the exhaust duct system shall be indicated by permanent labels or tags installed in an observable location.

2. Add new table as follows:

TABLE 504.6.1 (IFGC [M] TABLE 614.6.1)
DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH

DRYER EXHAUST DUCT FITTING TYPE	EQUIVALENT LENGTH (FEET)
4" radius mitered 45 degree elbow	2-1/2
4" radius mitered 90 degree elbow	5
10" radius smooth 45 degree elbow	3/4
10" radius smooth 90 degree elbow	1-1/2

PART II – IRC-M

1. Revise as follows:

M1502.6 (Supp) Duct length. The maximum length of a clothes dryer exhaust duct shall not exceed 35 feet (10 668 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced in accordance with Table M1502.6 ~~2.5 feet (762 mm) for each 45-degree (0.8 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend~~. The maximum length of the exhaust duct does not include the transition duct.

Exception~~s~~:

1. ~~1.~~ Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for the dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions.
2. ~~2. Where large-radius 45-degree (0.8 rad) and 90-degree (1.6 rad) bends are installed, the equivalent length of the clothes dryer exhaust duct for each bend shall be as provided in the fitting manufacturer's installation instructions. The engineering calculation used by the manufacturer of such fittings shall be in accordance with the ASHRAE Fundamentals Handbook.~~

2. Add new table as follows:

TABLE M1502.6
DRYER EXHAUST DUCT FITTING EQUIVALENT LENGTH

DRYER EXHAUST DUCT FITTING TYPE	EQUIVALENT LENGTH (FEET)
4" radius mitered 45 degree elbow	2-1/2
4" radius mitered 90 degree elbow	5
10" radius smooth 45 degree elbow	3/4
10" radius smooth 90 degree elbow	1-1/2

Reason (Part I): This change will take the text for equivalent length of dryer vent and place it in a table. New listings are added to the table for 10 inch radius elbows and 45s. The current code text is base on a 4 inch radius elbow.

By increasing the radius, the friction resistance is reduced. As such, the equivalent length is increased. The values for the 10 inch radius fitting are base on a comparison to the 4 inch radius fittings. Both ASHRAE and SMACNA publish table to use for friction resistance. The comparison uses these values and compares the equivalent length to the current code requirements.

Testing at UL verified that the 10 inch radius elbows perform significantly better than 4 inch radius elbows.

A detailed engineering report is available at www.dryer-ell.com.

Reason (Part II): This change will take the text for equivalent length of dryer vent and place it in a table. New listings are added to the table for 10 inch radius elbows and 45s. The current code text is base on a 4 inch radius elbow. The exception allows an analysis following ASHRAE.

It is easier for the code user to read a table than to run a calculation for equivalent dryer elbow length. The values for the 10 inch radius fitting are base on a comparison to the 4 inch radius fittings. Both ASHRAE and SMACNA publish table to use for friction resistance. The comparison uses these values and compares the equivalent length to the current code requirements.

Testing at UL verified that the 10 inch radius elbows perform significantly better than 4 inch radius elbows.

A detailed engineering report is available at www.dryer-ell.com.

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

PART I – IMC

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

PART II – IRC-M

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

M33–07/08
504.6.3 (New) [IFGC [M] 614.6.3 (New)]; IRC M1502.7 (New)

Proponent: John Neff, Washington State Building Code Council

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

504.6.3 (IFGC [M] 614.6.3) Protection required. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than 1-1/4 inches (32 mm) between the duct and the finished face of the framing member. The shield plate shall be steel not less than 1/16 inch (1.59 mm) in thickness. The shield plate shall extend to protect the entire width of the duct.

PART II – IRC

Add new text as follows:

M1502.7 Protection required. Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than 1-1/4 inches (32 mm) between the duct and the finished face of the framing member. The shield plate shall be steel not less than 1/16 inch (1.59 mm) in thickness. The shield plate shall extend to protect the entire width of the duct.

Reason: The purpose of this proposal is to ensure that combustible lint will not collect in the dryer duct, producing a risk of fire. If the duct is penetrated by a screw or nail, the “smooth interior finish” is compromised and a collection point is formed. Temperatures in the ducts can get high, especially when the duct is clogged and air flow is reduced.

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

PART I – IMC

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

PART II – IRC-M

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

M34–07/08
504.8 (New) [IFGC [M] 614.8 (New)]

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

Add new text as follows:

504.8 (IFGC [M] 614.8) Common exhaust systems for clothes dryers located in multi-story structures. Where a common multi-story duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of such system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistant-rated as required by the *International Building Code*.
2. Dampers shall be prohibited in the exhaust duct. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, Exception 2.
3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of not less than 24 gage sheet steel and in accordance with SMACNA Duct Construction Standards.
4. The ductwork within the shaft shall be designed and installed without offsets.
5. The exhaust fan motor design shall be in accordance with Section 503.2.
6. The exhaust fan motor shall be located outside of the airstream.
7. The exhaust fan shall run continuously, and shall be connected to a standby power source.
8. 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.
9. Makeup air shall be provided for the exhaust system.
10. A cleanout opening shall be located at the base of the shaft to provide access to the duct to allow for cleaning and inspection. The finished opening shall be not less than 12 inches by 12 inches.
11. Screens shall not be installed at the termination.

Reason: This practice has been used successfully across the US for several decades. The use of a common shaft to exhaust multiple clothes dryers and the many variables associated with such construction has never been addressed by the model codes. In addition, there is no industry standard for this application or installation. Due to the incomplete model code guidance/ provisions and lack of any type industry standard lead to the development of this proposal to address the many details that are currently omitted by any recognized code/standard for this type installation.

1. This requirement assures the integrity of the structure is maintained.
2. This is consistent with current IBC Section 716.5.3.
3. There is no way to account for the many different variables that exist when this application is utilized. This restriction helps avoid the velocity reduction at any offsets due to friction. In addition any offsets create the possibility of unwanted lint accumulation.
4. This minimum requirement prohibits the potential for a design that may permit the use of the gypsum enclosure itself to serve as the exhaust passageway.
5. This requirement ensures that the proper fan will be utilized for this application. This will prohibit the use of a typical roof mounted dome type fan that are designed for typical bathroom exhaust.
6. This is a current requirement of 504 for commercial dryers.
7. Again this is the exact requirement from current IBC Section 716.5.3 and IMC Section 607.5.5.2.
8. This configuration relies on the fact that the fan located on the top of the vertical riser is actually working. Otherwise excessive lint accumulation will collect in the bottom of the riser and in any subducts that the lint happens to pass by on its way down.
9. The IMC requires this for exhaust systems the air exhausted must be replaced.
10. The duct cleaning industry has the technology to clean these systems from this one cleanout on the bottom of the riser and through the top where the fan is located.
11. This requirement is consistent with current IMC and the clothes dryer manufacturer's installation recommendations.

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

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

M35–07/08

506.3.1, 506.3.1.1, 506.3.1.1.1 (New), 506.3.1.1.2 (New), 506.3.1.1.3 (New), 506.3.2, 506.3.6, 506.3.10, 506.3.10.1 (New), 506.3.10.1.1 (New), 506.3.10.1.2 (New), 506.3.10.2 (New), 506.3.10.3 (New)

Proponent: Vickie J. Lovell, InterCode, Inc., representing the 3M Company

1. Revise as follows:

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

2. Delete and substitute as follows:

~~**506.3.1.1 (Supp) Grease duct materials.** Grease ducts serving Type I hoods shall be constructed of steel not less than 0.055 inch (1.4 mm) (No. 16 Gage) in thickness or stainless steel not less than 0.044 inch (1.1 mm) (No. 18 Gage) in thickness.~~

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

506.3.1.1 Grease duct materials. Grease ducts serving Type I hoods shall be constructed in accordance with Section 506.3.1.1.1, 506.3.1.1.2 or 506.3.1.1.3.

3. Add new text as follows:

506.3.1.1.1 Field fabricated grease ducts. Field fabricated grease ducts shall be made of steel not less than 0.055 inch (1.4 mm) (No. 16 Gage) in thickness or stainless steel not less than 0.044 inch (1.1 mm) No. 18 Gage) in thickness.

506.3.1.1.2 Factory-built commercial kitchen grease ducts. Factory-built commercial kitchen grease ducts shall be listed and labeled in accordance with UL 1978 and installed in accordance with Section 304.1.

506.3.1.1.3 Fire-resistance-rated factory-built grease ducts. Fire-resistance-rated factory-built grease ducts shall be listed and labeled in accordance with UL2221 and installed in accordance with Section 304.1.

4. Revise as follows:

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

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are listed for the application.
2. Internal welding or brazing shall not be prohibited provided that the joint is formed or ground smooth and is provided with ready access for inspection.
3. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978 and installed in accordance with Section 304.1.
4. Fire-resistance-rated factory-built grease ducts listed and labeled in accordance with UL 2221 and installed in accordance with Section 304.1.

506.3.6 (Supp) Grease duct clearances. Grease duct systems and exhaust equipment serving a Type I hood ~~shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm)~~ shall be required to maintain clearances in accordance with their listing, or as follows:

1. Field fabricated grease ducts shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm)

~~**Exception:**~~

2. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978 ~~and listed and labeled exhaust equipment~~ shall be installed in accordance with Section 304.1 and shall maintain clearances in accordance with their listing.
3. Fire-resistance-rated factory-built grease ducts listed and labeled in accordance with UL 2221 and installed in accordance with Section 304.1 shall maintain clearances in accordance with their listing.
4. Exhaust equipment shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm) or shall be listed and labeled, and installed in accordance with Section 304.1, maintaining clearances in accordance with its listing.

5. Delete and substitute as follows:

~~**506.3.10 (Supp) Grease duct enclosure.** A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the out let terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. Ducts shall be enclosed in accordance with the *International Building Code* requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the out side of the building through the use of weather protected openings. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures shall be not less than 6 inches (152 mm). The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.~~

~~**Exceptions:**~~

1. ~~The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system tested and listed in accordance with ASTM E 814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. The duct shall be covered with a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose, in accordance with ASTM E2336. Such system shall be installed in accordance with the listing and the manufacturer's installation instructions. Exposed ductwrap systems shall be protected where subject to physical damage.~~
2. ~~The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system tested in accordance with ASTM E 814 or UL 1479, having an "F" and "T" rating equal to the fire resistance rating of the assembly being penetrated and where a listed and labeled prefabricated duct system, listed for such purposes in accordance with UL 2221, is utilized. Such system shall be installed in accordance with the listing and the manufacturer's installation instructions.~~
3. ~~A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.~~

506.3.10 Grease duct enclosures. A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be protected with a fire-resistance-rated factory-built grease duct or shall be enclosed with a field-applied grease duct enclosure. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems. Enclosures shall be protected where subject to physical damage.

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

6. Add new text as follows:

506.3.10.1 Nonfire-resistance rated, field-assembled ducts. Ducts assembled from steel or stainless steel shall be protected with an enclosure continuously covered on all sides with a material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions.

506.3.10.1.1 Shaft enclosures. Ducts protected with an enclosure constructed as a shaft in accordance with Section 707.1, 707.4, and 707.5 of the *International Building Code* shall be applied from the point of penetration to the outlet terminal. Clearance from the duct to the interior surface of the enclosures of combustible construction shall be not less than 18 inches (457 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures shall be not less than 6 inches (152 mm). Such duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather protected openings.

506.3.10.1.2 Wrap and board protection systems. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Ducts penetrations shall be protected with a through-penetration firestop system listed in accordance with ASTM E 814 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated.

506.3.10.2 Nonfire-resistance rated, factory-built ducts. Nonfire-rated factory-built ducts listed and labeled in accordance with UL 1978 shall be protected with a field applied enclosure in accordance with Section 506.3.10.1 where the clearance from the factory-built duct to the interior surface of the enclosures of combustible construction is less than 18 inches (457 mm), or where the clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures is less than 6 inches (152 mm). Such duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather protected openings.

506.3.10.3 Fire-resistance rated, factory-built grease duct. Fire-resistance rated factory-built grease ducts listed and labeled in accordance with UL 2221 shall be installed in accordance with the listing and the manufacturer's instructions. Duct penetrations shall be protected with a through-penetration firestop system listed in accordance with ASTM E 814 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated.

Reason: The reason for this modification is to address the issues identified in proposals M66, M70, M71, and M74 of the 2006-07 cycle, which include technical updates, a new test method, the various types of ducts and duct construction, and a reorganization of the existing incomplete formatting. In order to incorporate all the changes in product development and test and standards development, reformatting of numerous sections was required, particularly of 506.3.10.

Rather than being formatted using the protection method, this change proposes to identify the type of duct first, and then offer the protection options available based on new and new product technology, testing and field applications.

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

Analysis: In Section 506.3.6, how would the installer know which to follow when there are differences between the listing of the duct and Items 1 thru 4?
New Section 506.3.10 literally states that a grease duct shall be protected by a factory-built grease duct.
New Section 506.3.10.1, requires an enclosure, rather than the duct, to be continuously covered by a material, system, product or method of construction.

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

M36–07/08
506.3.2.1

Proponent: Doug Patterson, Sheet Metal and Air Conditioning Contractors of Western Washington, representing local contractors

Revise as follows:

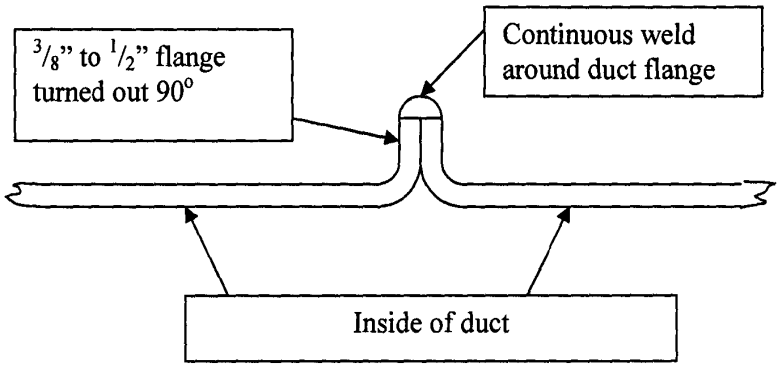
506.3.2.1 Duct joint types. Duct joints shall be butt joints, welded flange joints with a maximum flange depth of 0.5 inch (12.7 mm) or overlapping duct joints of either the telescoping or bell type. Overlapping joints shall be installed to prevent ledges and obstructions from collecting grease or interfering with gravity drainage to the intended collection point. The difference between the inside cross-sectional dimensions of overlapping sections of duct shall not exceed 0.25 inch (6 mm). The length of overlap for overlapping duct joints shall not exceed 2 inches (51 mm).

Reason: See the sketch below for a clarification of the proposed joint.

The purpose of the addition of the welded mini-flange joint to this section is to clarify the code and remove any interpretations by code officials that this joint is not allowed by the current code.

This joint must be allowed on rectangular exhaust ducts serving class 1 kitchen hoods because it is faster, easier to fabricate, easier to make liquid tight, more professional looking, and does not cause warping of the duct surface during the welding process which will form puddles in the bottom of the duct causing grease accumulation.

Contractors in the Pacific North West used this welded mini-flange joint successfully on Type 1 kitchen hood exhaust duct for years under the Uniform Mechanical Code. When Washington State transitioned from the 1997 Uniform Mechanical Code to the 2003 International Mechanical Code the welded mini-flange joint was not specifically listed as an acceptable connecting method for type 1 kitchen hood exhaust ducts. When Washington State adopted the 2006 IMC, the same dilemma existed. Currently, in some jurisdictions, a contractor must apply to the building official and ask for permission to use this welded mini-flange joint under IMC section 105.2 Alternative materials, methods, equipment and appliances. This is a time consuming process with no guarantee of acceptance.



Bibliography:
1997 Uniform Mechanical Code Section 507.3.2 Joints and seams of grease ducts. States, "Joints and seams shall be made with a continuous liquid-tight welded or braze made on the external surface of the duct system."

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

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

M37–07/08
506.3.2.5

Proponent: Eli P. Howard, III, representing SMACNA

Revise as follows:

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

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of duct work to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested.

Exception: Subject to the approval of the code official, the leakage test need not be performed in the presence of the code official provided that an approved agency submits a report of the results of the test.

Reason: Although we support the concept of the grease duct test requirement, the current language allowing "an approved equivalent test method" is at best ambiguous and has/will lead to non-uniform enforcement as each local code official may and have asked for various test methods (including, but not limited to: smoke tests, air pressure tests, high-pressure water tests, helium test, etc.) other than the light test, which has lead to an increased cost of the installation and test of grease duct systems.

SMACNA believes that having a test method (light test) as the approved method in the IMC will provide the needed requirement for enforcement of grease duct inspections and that the "or an approved equivalent test method" should be stricken to ensure a uniform inspection process.

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

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

M38–07/08
506.3.2.5

Proponent: Richard Grace, Fairfax County, VA, representing the Virginia Plumbing & Mechanical Inspectors Association

Revise as follows:

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

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of duct work to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested.

> ~~**Exception:** Subject to the approval of the code official, the leakage test need not be performed in the presence of the code official provided that an approved agency submits a report of the results of the test.~~

Reason: This committee modified action simply added frivolous language to the code. This requirement is already mandated in sections 104.4, 105.3, 107.1 and 107.1.1. This section does not need additional language to clarify what is already required in other sections of this code. If this were necessary, we need to insert this same language in sections 301.5, 507.16, multiple areas in [F] 513, 1004.2, 1105.4, 1108.1, and probably a few other sections not mentioned here.

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

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

M39–07/08
506.3.6, 506.3.10, 506.3.10.1 (New), 506.3.10.2 (New), 506.3.10.3 (New), 506.3.10.4 (New)

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

1. Revise as follows:

~~**506.3.6**~~ **506.3.9 (Supp) Grease duct clearances.** Grease duct systems and exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

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

2. Delete and substitute as follows:

~~**506.3.10 (Supp) Grease duct enclosure.** A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. Ducts shall be enclosed in accordance with the *International Building Code* requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures shall be not less than 6 inches (152 mm). The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.~~

~~**Exceptions:**~~

~~1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system tested and listed in accordance with ASTM E 814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. The duct shall be covered with a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose, in accordance with ASTM E2336. Such system shall be installed in accordance with the listing and the manufacturer's installation instructions. Exposed ductwrap systems shall be protected where subject to physical damage.~~
~~2. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through penetration firestop system tested in accordance with ASTM E 814 or UL 1479, having an "F" and "T" rating equal to the fire resistance rating of the assembly being penetrated and where a listed and labeled prefabricated duct system, listed for such purposes in accordance with UL 2221, is utilized. Such system shall be installed in accordance with the listing and the manufacturer's installation instructions.~~
~~3. A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.~~

506.3.10 Grease Duct Enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. Duct enclosures shall be either field-applied or prefabricated. Duct enclosures shall be as prescribed by Section 506.3.10.1, 506.3.10.2 or 506.3.10.3.

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

3. Add new text as follows:

506.3.10.1 Shaft enclosure. Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *International Building Code* requirements for shaft construction. Such grease duct systems and exhaust equipment shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (76 mm). Duct enclosures shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

506.3.10.2 Field applied enclosure. Field-applied grease duct enclosure assemblies shall consist of commercial kitchen grease ducts constructed in accordance with Section 506.3.1 enclosed by a 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 firestop system classified in accordance with ASTM E 814 and having an "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. Exposed duct wrap systems shall be protected where subject to physical damage.

506.3.10.3 Prefabricated enclosure. Prefabricated grease duct enclosure assemblies shall consist of listed commercial kitchen grease ducts constructed in accordance with Section 506.3.1. Such grease ducts shall be enclosed within a prefabricated grease duct enclosure assembly that is listed and labeled and specifically evaluated for such purpose in accordance with UL2221. Duct penetrations shall be protected with a through-penetration firestop system classified in accordance with ASTM E 814 and having an "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.

Reason: The purpose of the proposed code change is to re-organize Section 506.3.10 to reflect changes made in the 2006 IMC cycle, and to consolidate and simplify the Grease duct clearances provisions with the grease duct enclosure provisions.

During the last several cycles, there has been a great deal of discussion regarding the appropriate reference to test methods for fire resistive grease duct enclosure systems. Both ASTM E 2336 and UL 2221 were added to the exceptions to clause 506.3.10. However, there continue to be confusion regarding the requirements relating to clearances versus the requirements regarding grease duct enclosure materials. This proposal seeks to consolidate and clarify the different approaches.

The purpose of submitting the proposed change is identified above. There is confusion in the application of the IMC requirements by designers and code users. Part of this confusion has been the fact that the grease duct clearance requirements were located in 506.3.6, while the grease duct enclosure provisions, which also talk about clearances from the duct to the interior surfaces of enclosures of combustible or non-combustible construction, are located in 506.3.10.

In addition, the reorganization separates the three options for construction of the grease duct enclosures into separate, stand-alone articles. Both ASTM E 2336 and UL 2221 were added to the exceptions to clause 506.3.10. In reality, the existing base requirement to use the shaft enclosure provisions should be treated as an independent option for construction of the grease duct enclosure rather than the base requirement, given that test methods now exist for testing fire-resistive grease duct enclosure systems specifically.

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

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

M40–07/08
506.3.6

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

Revise as follows:

506.3.6 (Supp) Grease duct clearances. Grease duct systems and exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

Exceptions:

1. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978. ~~and~~
2. Listed and labeled exhaust equipment installed in accordance with Section 304.1.
3. Where commercial kitchen grease ducts are continuously covered on all sides with a listed and labeled field-applied grease duct enclosure material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336, the required clearance shall be in accordance with the listing of such material, system, product or method.

Reason: The purpose of the proposed code change is to add an additional exception to the grease duct clearance requirements in 506.3.6 and re-organize the exceptions.

There continues to be confusion regarding the requirements relating to clearances versus the requirements regarding grease duct enclosure materials. This proposal seeks to clarify that Listed and Labeled systems (permitted by 506.3.10), which are also tested and approved for their clearance to combustibles, can be installed in accordance with their Listings.

The purpose of submitting the proposed change is identified above. There is confusion in the application of the IMC requirements by manufacturers, designers and code users. Part of this confusion has been the fact that the grease duct clearance requirements are located in 506.3.6, while the grease duct enclosure provisions, which also talk about clearances from the duct to the interior surfaces of enclosures of combustible or non-combustible construction, are located in 506.3.10.

All manufacturers of field-applied grease duct enclosure systems have as part of their listings for each systems, an allowable for clearance from the outside of the enclosure system to adjacent combustibles. They achieve this based on the type, quantity, and method of installation of the protective enclosure materials, and test them in accordance with the ASTM E2336 Standard recognized in 506.3.10. As an example, some field-applied grease duct enclosure system manufacturers have listings for Zero Clearance or other clearance.

The materials are routinely used as an option for reducing clearances, particularly in cases where there is a limited amount of space available for other means of protection. Another typical use is in a 1 story restaurant where no rated wall/ceiling is being penetrated, but field-applied protection is installed because of the proximity of the grease duct to adjacent combustible construction.

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

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

M41–07/08
506.3.8.1

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

Revise as follows:

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

Reason: This is consistent with the logic throughout the I-codes that 22-inches is appropriate for shoulder width as it relates to entering or leaving a given space. An example is a shower door, it's required to be 22-inches wide. Also, multiples of 22 can be associated with corridor widths.

Cost Impact: Slight cost impact.

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

M42–07/08
506.3.8.1 (New)

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

Add new text as follows:

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

(Renumber subsequent sections)

Reason: Currently the code does not address cleanouts as it relates to in-line fans. This is minimal criteria based on national standards. (NFPA-96)

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

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

M43–07/08
506.3.12.3

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

Revise as follows:

506.3.12.3 (Supp) 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 ~~2~~ 3 feet (~~607~~ 914 mm) above air intake openings into any building. ~~Exhaust outlet terminations shall not be directed towards nor impinge on any structure.~~

Exception: Exhaust outlets shall terminate not less than 5 feet (1524 mm) 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 from such locations.

Reason: 3-feet is consistent with NFPA-96 Section 7.8.2 and needs to be maintained, especially when the lower velocity of 500 FPM is taken into consideration opposed to the 1500 FPM minimum velocity from before. The ability to pull contaminates into the building will be greater. If a gas vent must be 3-feet above openings, then it only makes sense that a grease discharge, with particulate matter potentially heavier than air, also be located 3-feet above openings. Sections 506, 507, and 508 are based on national standards and it would be inappropriate to arbitrarily lessen the standard. The 3-foot dimension is also consistent with other code sections such as IMC Section 918.6; IRC-G2427.7; G2427.8 #1; G2442.5 #1; and IFGC Sections 503.6.7 and 618.5. There is a long history of the 3-feet dimension. The last sentence is redundant language. 506.5.2 already covers impingement and " termination shall not discharge towards any structure" is not qualified by a number. If left in, a fan discharge could not be positioned toward a building 50 feet away.

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

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

M44–07/08
506.4.1, 506.4.3

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

1. Delete without substitution:

~~**506.4.1 Type II exhaust outlets.** Exhaust outlets for ducts serving Type II hoods shall comply with Sections 401.4 and 401.4.2. Such outlets shall be protected against local weather conditions and shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.~~

2. Revise as follows:

506.4.~~3~~2 (Supp) Type II terminations. Exhaust outlets serving Type II hoods shall terminate in accordance with the hood manufacturer's installation instructions and shall comply with all of the following:

1. Exhaust outlets shall terminate not less than 3 feet (914 mm) in any direction from openings into the building.
2. Outlets shall terminate not less than 10 feet (3048 mm) from property lines or buildings on the same lot.
3. Outlets shall terminate not less than10 feet (3048 mm) above grade.
4. Outlets shall terminate not less than 30 inches (762 mm) above the roof surface.
5. Outlets shall terminate not less than 30 inches f(762 mm) from exterior vertical walls.
6. Outlets shall be protected against local weather conditions.
7. Outlets shall not be directed onto walkways.
8. Outlets shall not create a nuisance.
9. Outlets shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

Reason: Every thing that was addressed in 506.4.1 has been addressed in the new 506.4.2 thereby creating one single section addressing all aspects of type II terminations. There is no need to reference a section that is within the body of the main section.

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

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

M45–07/08
506.4.3

Proponent: Derek Schrock, Halton Company, representing the Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

506.4.3 (Supp) Type II terminations. Exhaust outlets serving Type II hoods shall terminate in accordance with the hood manufacturer's installation instructions and shall comply with all of the following:

1. Exhaust outlets shall terminate not less than 3 feet (914 mm) in any direction from openings into the building.
2. Outlets shall terminate not less than 10 feet (3048 mm) from property lines.
3. Outlets shall terminate not less than10 feet (3048 mm) above grade.
4. Outlets <u>that terminate above a roof</u> shall terminate not less than 30 inches (762 mm) above the roof surface.
5. Outlets shall terminate not less than 30 inches (762 mm) from exterior vertical walls

Reason: The purpose of this change is to clarify the code for use with multiple-story buildings where sidewall exhaust is commonly used. The code requirement for a clearance above the roof and a clearance from an exterior wall are not achievable in these cases.

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

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

M46–07/08
507.1

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

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 710B, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15. <u>Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual appliance shall be considered as occupying not less than 100 square feet.</u>
3. Net exhaust volumes for hoods shall be permitted to be reduced during no-load cooking conditions, where engineered or listed multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section.

Reason: Recirculating systems are becoming increasingly more popular. The current code text fails to recognize that several of these systems can be located in one small area with out any ventilation what so ever. While they are tested to prevent particulate matter from being re-distributed into the space they do not completely remove heat or odors. This proposal is an attempt to address any application where recirculating systems are installed. This may be an application where a small restaurant has two, three, or more recirculating appliances installed to service the entire cooking operation or the single appliance that happens to be installed in an area to supplement the main cooking needs.

The 100 square feet measurement is a minimum that would require at least 70 cfm of exhaust for the space each appliance is installed (not even the exhaust rate required for a single water closet). This will assure that some type minimum exhaust is available to these spaces.

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

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

M47–07/08
507.1

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

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 710B, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15.
3. Net exhaust volumes for hoods shall be permitted to be reduced during no-load cooking conditions, where engineered or listed multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

Reason: Current text appears to allow the fan to stop operating just because cooking may not be occurring. This proposal clearly requires what the original intent meant to say. It is okay to reduce fan speeds, just not completely turn off when cooking appliances are in operation.

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

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

M48–07/08
507.1

Proponent: Donald Fisher, Fisher-Nickel, Inc., representing the Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 710B, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15.
3. Net exhaust volumes for hoods shall be permitted to be reduced during periods when the cooking appliances are idle or in a ready-to-cook mode and during periods of ~~no-load cooking conditions~~ part-load cooking conditions, where engineered or listed multispeed or variable-speed controls automatically operate the exhaust and makeup air system to maintain capture and removal of cooking effluents as required by this section.

Reason: To clarify the use of multi-speed exhaust systems for part-load cooking conditions.

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

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

M49–07/08
507.1

Proponent: Jim Weiler, Pueblo County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 710B, listed, labeled and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15.
3. Net exhaust volumes for hoods shall be permitted to be reduced during ~~no-load~~ part-load cooking conditions, where engineered or listed multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section.

Reason: No load means all appliances and equipment are off. Why are reduced volumes needed when there is no load? 507.2.1 requires that the hood must operate when cooking operations occur which may be only one appliance. That would be considered "part" load. It would be appropriate to want a lower flow under that condition. Reduced net volumes are not needed when the equipment is not being used or otherwise in a "no"-load condition.

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

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

M50–07/08
507.2.1, 507.2.2

Proponent: Antwone J. Ross, Chesterfield County, VA, representing the Virginia Plumbing & Mechanical Inspectors Association

Revise as follows:

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke~~, such as occurs with griddles, fryers, broilers, ovens, ranges and wok ranges~~. Type I hoods shall be installed over medium-duty, heavy-duty, and extra-heavy-duty cooking appliances.

507.2.2 (Supp) Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke~~, such as steamers, kettles, pasta cookers and dishwashing machines~~. Type II hoods shall be installed over light-duty appliances.

Exceptions:

1. Under-counter-type commercial dishwashing machines.

2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.
3. A single light-duty electric convection, bread, retherm or microwave oven. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
5. Any appliance having an engineered exhaust system incorporated as part of the appliance's design.

Reason: The purpose of the proposed change is to clarify the code requirements and allow more consistent enforcement.

The code does not explicitly state that medium duty, heavy-duty, and extra-heavy-duty appliances are required to be under type I hoods. This requirement is only implied by section 507.13. Section 507.13 is used to determine exhaust rates and is not the appropriate section to determine the type of hood required. Section 507.2 is the section that provides guidance on hood type requirements. Current code requirements for a type I hood are based on whether the cooking appliance generates grease or smoke and only includes a few examples. It is common practice for the AHJ to evaluate some cooking appliances on a case-by-case basis taking into consideration type and frequency of cooking as it relates to grease and smoke production. Based on this line of reasoning, it is not uncommon for the AHJ to determine a medium-duty appliance (such as conveyor style pizza ovens or rotisserie ovens) does not produce significant amounts of grease or smoke and therefore belongs under a type II hood. When this occurs the code does not offer any guidance on the minimum required exhaust rate. Section 507.13 only specifies exhaust rates for medium-duty appliances under type I hoods or light duty appliances under type II hoods. There is no category for medium-duty appliances under type II hoods. In summary, since there is no guidance for medium-duty appliances under type II hoods, one can only assume the code does not intend to allow this situation. The code needs to be changed to clearly required type I hoods for anything other than a light–duty appliance. Proposed change to Section 507.2.2 is to keep the format consistent with 507.2.1.

Cost Impact: The code change proposal will increase the cost of construction for those jurisdictions that may have allowed the installation of medium duty appliances under type II hoods.

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

M51–07/08
507.2.1.1

Proponent: Richard T. Jones, PE, National Engineering, Ltd., representing himself

Revise as follows:

507.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically ~~activate the exhaust fan whenever~~ deactivate cooking operations ~~occur~~ when the exhaust fan is not running. ~~The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods.~~

Reason: Due to the dirty air flow conditions that occur inside a hood and grease duct system the placement of sensors in these areas would be very problematic. Grease buildup, air flow turbulence and lack of proper maintenance could result in the fan starting and stopping when not expected. This proposed change will offer a more stable operation with proven technology by utilizing solenoid valves and shunt trip breakers, both located outside the hood, to deactivate the cooking equipment.

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

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

M52–07/08
507.2.2

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

Delete and substitute as follows:

~~**507.2.2 (Supp) Type II hoods.** Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.~~

~~**Exceptions:**~~

~~1. Under-counter type commercial dishwashing machines.~~
~~2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.~~
~~3. A single light-duty electric convection, bread, retherm or microwave oven. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.~~
~~4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.~~
~~5. Any appliance having an engineered exhaust system incorporated as part of the appliance's design.~~

507.2.2. Type II hoods. Type II hoods shall be installed above dishwashers and light-duty appliances that produce heat or moisture, except where the heat or 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 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.

Reason: Over the past several code cycles the exception has long surpassed the rule of this section. This proposal attempts to correct this fundamental flaw in the IMC. The laundry list of exceptions keeps growing each year. Now that the list of items that do not require hoods has exceeded the list of what does, the format must change also. It is only proper, for clarity and ease of use; that the codes reflect the more correct approach to these type issues. The original small list of exceptions was created to provide some relief for counter top type appliances. But the terms counter top never made it into the code and since then the list just keeps expanding. Designers and installers alike are taking full advantage of the philosophy that they can compare just about any other light duty appliance to one the list and assert "similarity" and most localities are approving light duty appliances without the benefit of hoods. Before the 1996 IMC was introduced two of the three legacy codes never required Type II hoods. To date, no evidence has been produced that reflects any negative results found in the many existing installations of these type appliances without hoods.

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

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

M53–07/08
507.2.2

Proponent: Richard Grace, Fairfax County, VA, representing the Virginia Plumbing & Mechanical Inspectors Association

Revise as follows:

507.2.2 (Supp) Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.

Exceptions:

1. Under-counter-type commercial dishwashing machines.
2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.
3. A single light-duty electric convection, bread, retherm or microwave oven designed for countertop installation. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
5. Any appliance having an engineered exhaust system incorporated as part of the appliance's design.

Reason: This is a clarification to exception 3. Exceptions 3 and 4 are similar in nature with regard to the minimal additional heat loads produced by these appliances. This change eliminates the possibility of very large, "light-duty" ovens from falling subject to this exception where the heat from these appliances can typically produce two or three times the amount of heat produced from a typical counter-mounted oven. The existing item number 3 was added a few years back with the intent to only cover counter mounted equipment. Committee action deleted the language "counter mounted" because of the lack of a clear definition as to what exactly is counter mounted. Designers and installers are abusing this section to promote the installation of large cabinet floor mounted bread ovens without a type II hood. That was never the intent of item number three. The intent is exactly what the new number 4 reflects. You will notice all of the items listed are typically small in size and low heat producing equipment. A five feet tall bread oven is not anywhere near the same application as a toaster or a hot dog cooker.

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

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

M54–07/08
507.2.2

Proponent: Jim Whitehead, Auto-Chlor System

Revise as follows:

507.2.2. (Supp) Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.

Exceptions:

1. Under-counter-type commercial dishwashing machines.
2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.
3. A single light-duty electric convection, bread, retherm or microwave oven. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
5. Any appliance having an engineered exhaust system incorporated as part of the appliance's design.
6. <u>A Type II hood is not required for low temperature, chemical sanitizing dishwashers that meet the current EPA "Energy Star" specifications.</u>

Reason: The purpose for this code change is to bring the code up to date and recognize the difference between hot water sanitizing dishwashers and energy efficient low temperature (chemical sanitizing) . With the new EPA "Energy Star" specifications, only the machines that have the lowest energy usage are recognized. The current EPA standard shows the following maximum water usage for Low Temp Efficiency: Single Tank Door Type 1.18 gal/rack, Single Tank Conveyor 0.790 gal/rack, Multiple Tank Conveyor 0.540 gal/rack.

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

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

M55–07/08
507.2.2

Proponent: Derek Schrock, Halton Company, representing the Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

507.2.2 (Supp) Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke, such as steamers, kettles, pasta cookers and dishwashing machines.

Exceptions:

1. Under-counter-type commercial dishwashing machines.
2. A Type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions.
3. A single light-duty electric convection, bread, retherm or microwave oven. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
4. A Type II hood is not required for the following electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.
5. Any appliance having an engineered exhaust system incorporated as part of the appliance's design. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.

Reason: The purpose of this change is to clarify the code so that the heat and moisture loads are accounted for as is currently done with items 3 and 4.

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

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

M56–07/08
507.2.3 (New)

Proponent: Timothy Kelley, Giles Enterprises Inc.

Add new text as follows:

507.2.3 Recirculating systems. Factory-built commercial cooking recirculating systems designed and listed for use with specific appliance types shall be installed in accordance with the manufacturer's installation instructions.

(Renumber subsequent section)

Reason: Recirculating Hoods that are specifically designed and listed by UL for specific types of appliances, such as conveyor ovens, convection ovens and rotisseries, and tested using the EPA 202 test for grease laden vapors meet the intent of the code. These hoods contain a grease baffle filter, electronic filter for grease laden air and charcoal filter. This section is dealing with grease laden vapors and fire suppression and our 202 test demonstrates the capture of the grease laden vapors. The unit can be field fitted with fire suppression if the appliance under the hood would require one.

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

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

M57–07/08
507.2.3

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

Revise as follows:

507.2.3 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances shall not be utilized for commercial purposes. ~~shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2.~~

Reason: This text violates current IMC code section 301.4. if an appliance is listed and labeled as "domestic" use and it is being utilized for commercial purposes it is clearly not within the listing of the appliance. The same concept of utilizing commercial appliances in a residential setting was submitted to the IFGC last code cycle and was soundly defeated based on the conflict that would be created. This is a much needed correction of the IMC.

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

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

M58–07/08
507.2.4

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

Revise as follows:

507.2.4 Extra-heavy-duty. Type I hoods for use over extra-heavy-duty cooking appliances shall not cover ~~other~~ heavy, medium or light-duty appliances. ~~that require fire extinguishing equipment and~~ Such hoods shall discharge to an exhaust system that is independent of other exhaust systems.

Reason: As written this section makes very little sense. This would indicate that two solid fuel burning grills could not sit next to one another and utilize the same hood because the second requires fire suppression. The intent is to not have other types of appliances under the same hood as solid fuel burning appliances such as heavy, medium, or light duty appliances.

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

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

M59–07/08
507.13.1, 507.13.2, 507.13.3, 507.13.4

Proponent: Antwone J. Ross, Chesterfield County, VA, representing the Virginia Plumbing & Mechanical Inspectors Association

Revise as follows:

507.13.1 Extra-heavy-duty cooking appliances. The minimum net airflow for ~~Type I~~ hoods used for heavy-duty cooking appliances shall be determined as follows:

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

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

507.13.2 Heavy-duty cooking appliances. The minimum net airflow for ~~Type I~~ hoods used for heavy-duty cooking appliances shall be determined as follows:

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

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

507.13.3 Medium-duty cooking appliances. The minimum net airflow for ~~Type I~~ hoods used for medium-duty cooking appliances shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

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

507.13.4 Light-duty cooking appliances. The minimum net airflow for ~~Type I~~ hoods used for light duty cooking appliances and food service preparation ~~and cooking operations approved for use under a Type II hood~~ shall be determined as follows:

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

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

Reason: The purpose of the proposed change is to clarify the code requirements and allow more consistent enforcement.

The code does not explicitly state that medium duty, heavy-duty, and extra-heavy-duty appliances are required to be under type I hoods. However, this requirement is implied by section 507.13. Section 507.13 is used to determine exhaust rates and is not the appropriate section to determine the type of hood required. Section 507.2 is the section that provides guidance on hood type requirements. Current code requirements for a type I hood are based on whether the cooking appliance generates grease or smoke. It is common practice for the AHJ to evaluate some cooking appliances on a case-by-case basis taking into consideration type and frequency of cooking as it relates to grease and smoke production. Based on this line of reasoning, it is not uncommon for the AHJ to determine a medium-duty appliance (such as conveyor style pizza ovens or rotisserie ovens) does not produce significant amounts of grease or smoke and therefore belongs under a type II hood. When this occurs the code does not offer any guidance on the minimum required exhaust rate. Section 507.13 only specifies exhaust rates for medium-duty appliances under type I hoods or light duty appliances under type II hoods. There is no category for medium-duty appliances under type II hoods. If an AHJ only requires a type II hood for a medium-duty appliance, the code does not provide a minimum exhaust rate for that scenario. In summary, the hood type referenced in sections 507.13.1-507.13.4 is misleading and unnecessary. The intent of the prescribed exhaust rates is to ensure capture and containment of the effluents under the hood, regardless of whether its steam, smoke, grease, heat, odor…etc. Hood types should be determined in the 'where required' section.

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

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

M60–07/08

507.13.2, 507.13.3, 507.13.4

Proponent: Richard Swierczyna, Architectural Energy Corporation, representing the Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

507.13.2 Heavy-duty cooking appliances. The minimum net airflow for Type I <u>or Type II</u> hoods<u>, as determined by Section 507.2,</u> used for heavy-duty cooking appliances shall be determined as follows:

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

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

507.13.3 Medium-duty cooking appliances. The minimum net airflow for Type I or Type II hoods, as determined by Section 507.2, used for medium-duty cooking appliances shall be determined as follows:

Type of Hood	CFM per linear foot of hood
Backshelf/pass-over	300
Double island canopy (per side)	300
Eyebrow	250
Single island canopy	500
Wall-mounted canopy	300

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

507.13.4 Light-duty cooking appliances. The minimum net airflow for Type I or Type II hoods, as determined by Section 507.2, used for light duty cooking appliances and food service preparation and cooking operations approved for use under a Type II hood shall be determined as follows:

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

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

Reason: Clarify the intention that the appliance duty category dictates the hood airflow rate and that the cooking process emissions dictate the use of Type I or Type II hood.

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

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

M61–07/08
508.1

Proponent: Doug Horton, D.J. HORTON and Associated, Inc., representing the Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

508.1 (Supp) Makeup air. Makeup air shall be supplied during the operation of commercial kitchen exhaust systems that are provided for commercial cooking appliances. The amount of makeup air supplied to the building from all sources shall be approximately equal to the amount of exhaust air for all exhaust systems for the building. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air shall be provided by gravity or mechanical means or both. For mechanical makeup air systems, the makeup air system shall be automatically controlled to start and operate simultaneously with the exhaust system. Makeup air intake opening locations shall comply with Sections 401.4 and 401.4.1.

Reason: The current section is often misapplied in situations where makeup air for exhaust hoods is provided through dedicated makeup air units in addition to providing makeup air through HVAC units. In these situations, it's clearly the intent of the code to maintain air balance as specified in Section 4. Instead, some code officials require that the amount dedicated makeup air shall be equal to the amount of exhaust air, which makes air balance unachievable because outdoor air from HVAC units that is used as makeup air is not considered. This misapplication creates an over pressurized condition, which is contrary to common design practice. The proposed revision clarifies the intent of the code and is consistent with common air balance design practice, by which all sources of makeup air and all uses of exhaust air are specified to be approximately equal, except for slight pressurization of the overall space.

The reasoning stated above is explained in the IMC Commentary for Section 508.1.1, but it's not in the commentary for Section 508.1, to which it applies also. Since code officials rely more on the explicit code provisions than the commentary, misapplication will be reduced by addition of the clarifying words to the code.

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

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

M62–07/08
508.1.1

Proponent: Doug Horton, D.J. HORTON and Associated, Inc., representing the Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

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

~~**Exceptions:**~~

~~1. Makeup air that is part of the air-conditioning system.~~
~~2. Makeup air that does not decrease the comfort conditions of the occupied space.~~

Reason: The proposed revision clarifies the intent of the code by adding language that embodies and strengthens the essence of the current exceptions, as explained extensively in the IMC Commentary and deletes the existing exceptions.

Previous exception #1 is unnecessary because makeup air delivered by the air conditioning system is heated and cooled to whatever space conditions are set by thermostats or other controls.

Previous exception # 2 is replaced by the proposed new language, which speaks to the heart of the issue: dedicated makeup units are provided in many commercial kitchen ventilation system designs to save energy by providing makeup air that is by design not heated or cooled to space conditions. This is possible by providing the makeup air near exhaust hoods, often directed toward exhaust hoods, such that the makeup air is exhausted before imposing significant heating or cooling load to the space. To the extent that dedicated makeup air might impose a load to the space, comfort conditions are maintained if the installed heating or cooling capacity is sufficient to handle the overall load. Whether dedicated makeup air is heated or cooled, and the extent to which it needs to be heated and cooled, depends upon the overall mechanical design, capacities of installed heating and cooling relative to internal and external heating and cooling loads, and the relative efficiencies of heating, cooling, and makeup air delivery designs. Design discretion should be given to mechanical designers such that energy savings are possible while comfort conditions are simultaneously maintained.

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

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

M63–07/08
508.1.2 (New)

Proponent: Doug Horton, D.J. HORTON and Associated, Inc., representing the Commercial Kitchen Ventilation Technical Interest Group

Add new text as follows:

508.1.2 Makeup air heating and cooling. Where heating or cooling is provided for kitchen makeup air, the makeup air unit and HVAC unit heating and cooling controls shall be electrically interlocked to preclude simultaneous heating and cooling of the kitchen space.

Reason: As currently explained by the IMC Commentary for Section 508.1.1, a common problem of energy waste and kitchen comfort occurs when kitchens are simultaneous heated and cooled by kitchen makeup and HVAC units.

Typically, commercial kitchens are hot and the need for mechanical cooling is frequent. This results in heating/cooling balance points that are much lower than typical commercial spaces. Commonly, dedicated makeup units are provided to furnish makeup air to the kitchen without heating or cooling the air to space conditions, to save energy. Usually, kitchen HVAC units are controlled by kitchen space thermostats, while dedicated makeup units are typically controlled by entering outdoor air and/or makeup duct thermostats. If the makeup and HVAC units are not interlocked, conditions of heating the makeup air, based on lower than balance point outdoor conditions, are encountered while the kitchen is being cooled by the HVAC unit, based on hot kitchen conditions. This condition wastes significant amounts of unnecessary heating and cooling energy, while compromising kitchen comfort conditions.

Simultaneous heating and cooling of kitchen spaces is easily avoided by providing a simple low voltage interlock circuit and relay, such that if the kitchen space thermostat is calling for cooling, heating by the makeup unit is locked out.

Note that the converse lockout is likely unnecessary because the condition of kitchen makeup air cooling with HVAC kitchen heating is rare.

Cost Impact: Small investment in interlock circuit and relay will likely provide large saving in energy in facilities with makeup air heating.

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

M64–07/08
510.6.1

Proponent: Dave Collins, AIA, The Preview Group, Inc., representing the AIA Codes Committee

Revise as follows:

510.6.1 Fire dampers and smoke dampers. Fire dampers and smoke dampers are prohibited in hazardous exhaust ducts.

Reason: The exhaust system for hazardous materials should not be interrupted under any set of circumstances. It is important to have the ventilation of any of these materials flowing even if there is an emergency in order to minimize exposure to the responding personnel and to protect the environment.

Cost Impact: There is no cost impact for this code change. Most designers don't design and code officials don't require smoke dampers or fire dampers in high hazard exhaust systems because of the need to maintain such systems even in the event of an emergency.

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

M65–07/08
510.8.2

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

Revise as follows:

510.8.2 Clearance to combustibles. Ducts shall have a clearance to combustibles in accordance with Table 510.8.2. Exhaust gases having temperatures in excess of 600ºF (316ºC) shall be exhausted to a chimney in accordance with Section 511.2.

> **Exception:** Where the surface of the duct is continuously covered on all sides from the point at which the duct originates to the outlet terminal with a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336, the required clearance shall be in accordance with the listing of such material, system, product or method. Such material,system, product or method shall be installed in accordance with the listing and the manufacturer's installation instructions.

Reason: To introduce an alternative method for establishing clearances to combustibles for ducts used to convey hazardous exhaust as required in 5.10.8 of the IMC. The protection of these ducts can be accomplished using enclosures tested to the ASTM E2336 test Standard for fire resistive grease duct enclosures.

There are alternative methods available for providing protection for hazardous exhaust duct enclosures beyond the existing clearance provisions. ASTM E 2336 is entitled *Standard Test Methods For Fire Resistive Grease Duct Enclosure Systems,* and is currently referenced in the IMC. The Standard is based on the methodology that has been widely used throughout the United States for the evaluation of Grease Duct enclosures for over 10 years.

There are parallels between the level of performance required for hazardous exhaust ducts as compared to Grease ducts and grease duct enclosures. The ASTM E2336 standard evaluates these enclosure materials and the duct enclosure systems using the following test methods: noncombustibility, full scale fire resistance , durability, internal fire, and fire-engulfment with a through-penetration fire stop.

The test method prescribes an ASTM E119 fire exposure for both a fire engulfment and a fire resistance wall test. The fire resistance test illustrates the ability of the enclosure material to resist the effects of fire when applied in a vertical application (i.e. as a wall assembly tested in accordance with ASTM E119).

A durability test is included for the materials, which is intended to simulate the effects of long-term exposure of typical in-service conditions on the thermal transmission qualities of the enclosure materials when subjected to a modified version of Test Method C 518.

In addition, an internal fire test uses two standardized fire exposures occurring inside the protected duct itself. Both tests illustrate the enclosure material's ability to resist thermal transmission of heat to the unexposed side in a horizontal application. The first standardized fire exposure is intended to simulate long term exposure of the enclosure material to a standardized service condition. The test simulates an internal fire within the duct by maintaining a minimum 500°F (260°C) average interior temperature for at least 4 h. The second standardized fire exposure is intended to simulate a sudden rise in the exposure conditions within the duct. Within 15 min after the end of the 4-h period, increase the average interior temperature in the duct is increased to 2000°F (1093°C). This exposure is then maintained for 30 minutes. While the 500°F used to simulate typical operating temperatures in ASTM E2336 is lower than the 600°F stipulated by 510.8.2, it does represent a tested level of performance, and is supplemented by the additional test at 2000°F for 30 minutes, which simulates a large fire event within the duct.. The current provisions of 5.10.8.2 do not explicitly take this into account.

A fire-engulfment test uses a standardized fire exposure, the time temperature curve of Test Methods E 119, to simulate a fire occurring on the outside of the grease duct, and demonstrates the ability of the grease duct enclosure system to remain intact without a through opening. The fire-engulfment test also tests the fastening methods used to secure the enclosure material to the grease duct and the supporting system. The fire-engulfment test also provides a means to test a through-penetration fire stop to determine its compatibility with the duct enclosure system. The fire-engulfment and vertical fire resistance tests are followed by the application of a standardized hose stream test.

Enclosure systems which meet the ASTM E2336 criteria demonstrate the ability to resist the passage of flames and hot gases during a standardized fire resistance test and a standardized internal fire test, as well as an ability to resist transmission of heat through the duct and the enclosure material(s). The ability of a fire stop to meet the requirements of Test Method E 814 when used with the duct enclosure system is also evaluated.

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

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

M66–07/08
514.2

Proponent: Chuck Murray, Washington State University Extension Energy Program, representing Northwest Energy Code Group

Revise as follows:

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

1. Hazardous exhaust systems covered in Section 510.
2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust.
3. Smoke control systems covered in Section 513.
4. Commercial kitchen exhaust systems serving Type I ~~and Type II~~ hoods except where the energy recovery ventilation system is provided with an automatic heat exchanger wash-down system.
5. ~~Clothes dryer exhaust systems covered in Section 504.~~

Reason: This proposal eliminates three prohibitions for energy recovery ventilation systems, Type I exhaust hoods with wash-down systems, all Type II hoods, and clothes dryer exhaust systems. This will allow energy recovery systems to be installed on these systems.

Removing prohibition of heat recovery for kitchen hoods. Prohibiting energy recovery ventilation from Type II hoods did not draw any support from engineers polled. Moisture-laden exhaust air is an ideal opportunity for energy recovery. Heat recovery ventilation equipment is made to deal with condensation, which occurs within the units. The 2007 ASHRAE Handbook – HVAC Applications, Section 31.21 discusses the appropriate application for heat recovery systems installed in both Type 1 and Type 2 kitchen hoods. When exhaust air contains grease (Type 1 hood), ASHRAE recommends automatic wash-down systems to remove grease and other contaminants from the heat transfer surface and discusses the systems applicability in industrial food service applications and extreme climates. The major reservation discussed in the ASHRAE handbook is based on cost effectiveness in some applications with moderate climates. Heat recovery systems on both Type I and Type II systems have been installed successfully in many applications. Section 501 of the 2006 IECC allows ASHRAE Standard 90.1 as a compliance option, and Section 6.5.6 of that Standard actually requires heat recovery for Type II hoods.

Removing prohibition of heat recovery for clothes dryer exhaust systems. Heat recovery systems for clothes dryer exhaust have been installed successfully within the Ramada Hotel chain and the State of Oregon prison system. A system manufactured by Rototherm (www.rototherm.net) relies on heat wheel technology, which includes supply and exhaust air in a counterflow arrangement passing through the rotating wheel in opposite directions, resulting in a self cleaning mechanism.

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

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

M67–07/08
601.4

Proponent: Mark Riley, City of Troy, MI, representing the Mechanical Inspectors of Michigan

Revise as follows:

601.4 Contamination prevention. Exhaust ducts under positive pressure, chimneys, and vents shall not extend into or pass through ducts or plenums.

Exception: Exhaust systems located in ceiling return air plenums over spaces that are permitted to have 10% recirculation in accordance with Section 403.2.1, Item 4. The exhaust duct joints, seams and connections shall comply with Section 603.9.

Reason: Based on previous code changes to allow toilet, shower rooms , bath rooms, and locker rooms in Section 403.2.1 and note h in the ventilation table 403.3 to allow 10% recirculation, to prohibit the same exhaust systems in the return air plenum does not make any sense. This code change will allow some flexibility of the designer to use smaller bath fans at the drop ceiling level, and not have to use a roof fan so that the ducts are not under positive pressure.

Usually these fans are a low static pressure of .10 water column and very little leakage in a plenum. With duct joints being sealed to Section 603.9, there would be very little leakage, if any, to cause any problems.

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

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

M68–07/08
602.2.1

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

Revise as follows:

602.2.1 (Supp) 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 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.

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~~ dwelling units located in R2 and R3 occupancies.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within continuous noncumbustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.

Reason: The design of return plenums is being utilized within apartments and condominiums (R2 and R3). Current text requires that in this application the regulations for plenums that are typically found in commercial structures be adhered to. The characteristics of plenums located in the single units of apartments and condos more closely resemble that of a residential application than that of an office building environment. One and two family dwelling text is more appropriately located in the IRC.

Cost Impact: Cost savings.

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

M69–07/08
602.2.1

Proponent: Randall R. Dahmen, Wisconsin Registered PE and Licensed Commercial Building Inspector, representing himself

Revise as follows:

602.2.1 (Supp) 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 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.

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~~ dwelling units.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within continuous noncumbustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.

Reason: The code language clearly addresses one and two family dwellings. Yet the code commentary clearly references dwelling units multiple times, and references "common corridor". IMC 202 defines a dwelling unit as, "A single unit provided complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation."

The 2003 IMC Code commentary states, " .... Exception 3 exempts dwelling units from the requirements of this section. This exception is applicable only to materials exposed within a plenum that is located within the actual dwelling unit. This exception does not apply to plenums outside the dwelling unit (for example, a plenum located above a common corridor outside the dwelling unit). Plenums within a dwelling unit are usually small and exposed materials within the plenum do not constitute an unacceptable hazard."

Section 602 of the IMC defines a plenum and the definition includes other spaces used for environmental air as found in Section 300.22 (C) of the 2005 NEC. By the IMC definition, plenums can have no combustible materials or if they do, they are required to meet the criteria for flame spread and smoke development as found in Section 602.2.1 of the IMC.

For reference, NEC section 300.22(C) states, "Other Space Used for Environmental Air". This section applies to space used for environmental air-handling purposes other than ducts and plenums as specified in 300.22(a) and (b). It does not include habitable rooms or areas of buildings, the prime purpose which is not air handling. Exception: This section shall not apply to the joist or stud spaces of dwelling units where the wiring passes through such spaces perpendicular to the long dimension of such spaces."

IMC 602.2.1Exception 3 says that the Section shall not apply to one- and two-family dwellings. Strange, since the IMC is not part of the IRC (International Residential Code) and does not apply to one- and two-family dwellings. The IMC commentary says Exception No 3 exempts dwelling units from the requirement of the section. Note that a townhouse, condominium, and apartments would meet the criteria of a dwelling unit addressed earlier.

The IMC applies to commercial buildings including those classed as multifamily dwellings, or similar occupancies defined under R2. The error is that the wording in the code should say, and is intended to say, "dwelling units". The proposal is to modify the wording so as to include dwelling units, as already accepted by the NEC.

This would correlate this IMC section with the NEC and the IMC commentary.

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

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

M70–07/08
602.2.1

Proponent: Randall R. Dahmen, Wisconsin Registered PE and Licensed Commercial Building Inspector, representing himself

Revise as follows:

602.2.1 (Supp) 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 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. The physical size of materials exposed within the plenum shall not adversely affect the capability of the plenum to convey the required air flow.

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 noncumbustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.

Reason: At present, there are plenums in which the introduction of various materials within a plenum affect the velocity or capacity of the plenum to convey the required air flow rates, yet there is no language which specifically addresses this issue. The proposed language addresses those situations when piping, or similar assemblies which are recognized by IMC 602.2.1, are placed in a stud cavity or joist space plenum, and the placement causes air movement difficulties.

Note that duct construction requirements under IMC 603.1 state that, "An air distribution system shall be designed and installed to supply the required distribution of air". The problem is that the language in IMC 603.1 applies to the construction of ducts and not to the construction of plenums.

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

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

M71–07/08
602.2.1.4, 602.2.1.4.1 (New), 602.2.1.4.2 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Delete and substitute as follows:

~~**602.2.1.4 Combustible electrical equipment.** Combustible electrical equipment exposed within a plenum shall have 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 when tested in accordance with UL 2043. Combustible electrical equipment shall be listed and labeled.~~

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

2. Add new text as follows:

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

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

Reason: UL 2043 contains the peak rate of heat release and peak optical density requirements. This provides the code official the tools needed for the IMC.

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

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

M72–07/08
602.2.1.5 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Add new text as follows:

602.2.1.5 Plumbing and mechanical equipment in plenums. Discrete plumbing and mechanical equipment, appurtenances and appliances with combustible material exposed within a plenum shall be listed and labeled for such use in accordance with UL 2043.

(Renumber subsequent sections)

Reason: UL 2043 was developed to test products and materials that are not able to be tested in accordance with ASTM E84 or UL 723. These discrete products include air duct supports, registers, air diffusers, and control dampers.

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

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

M73–07/08
602.2.1.6 (New)

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

Add new text as follows:

602.2.1.6 Plastic piping. Plastic piping exposed within a plenum shall be used only in wet pipe systems and 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. Piping shall be listed and labeled for plenum use. The listing shall state that the pipe did not contain water during the fire test.

(Renumber subsequent sections)

Reason: Plastic piping is often used exposed in plenums. This is perfectly appropriate when the pipe has been properly listed and labeled as a result of a valid fire test in the ASTM E 84 test with the pipe itself. Unfortunately it has become the custom of some pipe manufacturers to test the pipe when it is full of water. Such a test would clearly not be appropriate, but the practice of filling pipes with water during a fire test is not prohibited explicitly in the fire test standard, ASTM E 84. We can now find pipes that have been listed as a result of fire testing conducted with the pipe full of water. The standards committee (ASTM E05.22) says that this is a code issue and not an issue for the test method. The proposed new IMC code section has been drafted to parallel the section on fire sprinkler piping, 602.2.1.2.

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

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

M74–07/08
603.2 (New)

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

Add new text as follows:

603.2 Air duct enclosures. Where ducts are used as part of an approved smoke control system conforming to Section 513, the ducts shall be located within enclosures constructed in accordance with the *International Building Code* requirements for shaft construction.

Exceptions:

1. The shaft enclosure provisions of the *International Building Code* shall not be required where a duct penetration is protected with a through-penetration fire stop system classified in accordance with ASTM E 814 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from a point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified, listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standards for such enclosure materials.
2. Where fire dampers have been approved for use in the smoke control system, and their operation will not interfere with the operation of the smoke control system installed and approved in accordance with Section 909 of the *International Building Code*.

(Renumber subsequent sections)

Reason: The purpose of this code change proposal is to introduce provisional language into the IMC to address systems used for covering and protection of HVAC air ducts used as part of an approved smoke control system.

The covering of duct systems for fire protection is becoming more and more popular. The current code text fails to address this application for HVAC air ducts. When Ducts are used as part of an approved smoke control system in accordance with Section 909 of the IBC, fire dampers are only permitted where their use would not interfere with
the operation of a smoke control system.

The IBC and IMC currently do not have specific provisions for protection of air ducts which are used as part of an approved smoke control systems or for stairwell pressurization to be protected from fire exposure. This text is similar to the language which had previously been used for grease duct enclosures assemblies in Section 506.3.10. At that time, the most widely used alternative to the general shaft enclosures provisions was ICBO-ES AC 101 Acceptance Criteria for Grease Duct Enclosure Materials. Similarly, in November of 2005, ICC-ES approved the publication of AC 179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies, which can be used to evaluate products used for these applications. The purpose of the acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, as alternatives

to shaft enclosures for vertical ducts with required fire-resistance-rated shafts under specified conditions, with limitations on their application. The criteria also provides an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting not more than two stories.

AC 179 evaluates the enclosure materials and the HVAC duct enclosure systems using the following test methods: Flame spread, smolder resistance, a fire engulfment test based on ISO 6944 with a through-penetration fire stop, durability tests, and thermal conductivity.

Work is currently underway on the development of an ASTM Consensus Standard for this application, but until such time as that process is complete, the proposed language incorporated here will provide a means of evaluating the performance of these products and systems, which are becoming more widespread in their use, while not restricting the choice of acceptable solutions available to designers.

Bibliography:
ICC-ES AC179, Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies.

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

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

M75–07/08
603.7

Proponent: Tim Manz, University of Minnesota, representing the Association of Minnesota Building Officials (AMBO)

Revise as follows:

603.7 Rigid duct penetrations. Duct system penetrations of walls, floors, ceilings and roofs and air transfer openings in such building components shall be protected as required by Section 607. Ducts in a private garage and ducts penetrating the walls or ceilings separating a dwelling from a private garage shall be continuous and constructed of a minimum 26 gage (0.48 mm) galvanized sheet metal and shall not have openings into the garage. Fire and smoke dampers are not required in such ducts passing through the wall or ceiling separating a dwelling from a private garage except where required by Chapter 7 of the *International Building Code*.

Reason: The IMC and IBC do not clearly address duct penetrations of private garages in condominiums and townhouses that are built to the IMC and IBC, so this section clarifies that fire and smoke dampers are typically not required if the duct is continuous and constructed of minimum 26 gage sheet metal. This clarification is necessary due to the numerous misinterpretations of IBC Chapter 7 that have resulted in fire or smoke dampers being installed at these locations when it is not the intent of the code for them to be installed.

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

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

M76–07/08
603.7 (New)

Proponent: James Karnes, Dura-Tite Systems LLC

Add new text as follows:

603.7 Duct fittings. Metallic duct fittings shall be constructed in accordance with the requirements of Section 603.4. Plastic and nonmetallic duct fittings shall have 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 when tested in accordance with UL 2043. Such fittings shall be listed and labeled.

(Renumber subsequent sections)

Reason: The purpose of this code change is to allow products that are not capable of being tested under UL 723 *Test for Surface Burning Characteristics of Building Materials* **to be tested under the expanded scope of UL 2043** *Standard for Safety Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces.* The scope of UL 2043 has been expanded to include 'other discrete products' beyond electrical components and speaker enclosures. The purpose of the UL 2043 test is to determine 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 following codes: *National Electric Code, NFPA 70, International Mechanical Code, NFPA 5000, Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA 90A*.

Revisions to the UL 2043 Standard effective Fall 2007 relate to the inclusion of "other discrete products" in the plenum space. This has been expanded due to product submissions that are not able to be tested under UL723 Test for Surface Burning Characteristics of Building Materials. UL 2043 –This is a fire test method for determining the fire performance response of discrete products (including, but not limited to electrical equipment) intended to be installed in air handling spaces, such as above suspended ceilings or below floors. These products are

subjected to an open flame ignition source and evaluated using a product calorimeter. This test may be used to determine fire performance and smoke characteristics of discrete, non-continuous building materials where the Test for Surface Burning Characteristics of Building Materials, UL 723, is not applicable.

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

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

M77–07/08
603.8

Proponent: James Karnes, Dura-Tite Systems LLC

Add new text as follows:

603.8 Nonmetallic duct collars or fittings intended for use with listed flexible air ducts shall be listed and labeled for the use in accordance with UL 2043 and the applicable requirements of UL 181.

(Renumber subsequent sections)

Reason: The purpose of this code change is to allow products that are not capable of being tested under UL 723 *Test for Surface Burning Characteristics of Building Materials* **to be tested under the expanded scope of UL 2043** *Standard for Safety Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces.* The scope of UL 2043 has been expanded to include 'other discrete products' beyond electrical components and speaker enclosures. The purpose of the UL 2043 test is to determine 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 following codes: *National Electric Code, NFPA 70, International Mechanical Code, NFPA 5000, Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA 90A*.

Revisions to the UL 2043 Standard effective Fall 2007 relate to the inclusion of "other discrete products" in the plenum space. This has been expanded due to product submissions that are not able to be tested under UL723 Test for Surface Burning Characteristics of Building Materials. UL 2043 –This is a fire test method for determining the fire performance response of discrete products (including, but not limited to electrical equipment) intended to be installed in air handling spaces, such as above suspended ceilings or below floors. These products are subjected to an open flame ignition source and evaluated using a product calorimeter. This test may be used to determine fire performance and smoke characteristics of discrete, non-continuous building materials where the Test for Surface Burning Characteristics of Building Materials, UL 723, is not applicable.

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

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

M78–07/08
603.8

Proponent: Larry J. Larson, Wheeling Service and Supply, Inc.

Revise as follows:

603.8 Underground ducts. Ducts shall be approved for underground installation. Metallic ducts not having an approved protective coating shall be completely encased in a minimum of 2 inches (51 mm) of concrete. Factory-built PVC-coated metallic ducts, complying with UL 181 for Class 1 ducts and installed in accordance with the manufacturer's instructions, shall be exempt from concrete encasement.

Reason: The purpose of this change is to clarify the code. The way the current code reads doesn't make a lot of sense. It says "ducts not having an approved coating", is there a list somewhere of approved coatings? How would the building inspector know if the coating is approved? At least my change would reflect the use of PVC coated metallic material. This material has been successfully used in this application for more than 40 years without concrete encasement.

Per **603.8.3**, PVC plastic ducts and fittings are acceptable for burial without concrete encasement. PVC is an inert material and will not corrode. PVC coated metal exhibits the same properties. Of course, the PVC coated metal must meet the U/L specifications listed above.

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

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

M79–07/08
603.9; IRC M1601.3.1

Proponent: John R. Addario, PE, New York State Department of State Codes Division

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

603.9 (Supp) Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC *Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams, and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants, or tapes. Closure systems ~~Tapes and mastics~~ used to seal ductwork listed and labeled in accordance with UL 181A shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or"181 A-H" for heat-sensitive tape. Closure systems ~~Tapes and mastics~~ used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any metal ducts.

PART II – IRC-M

Revise as follows:

M1601.3.1 (Supp) Joints and seams. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other approved closure systems. Closure systems used with rigid fibrous glass ducts shall complywithUL181A and shall be marked "181A-P" for pressure-sensitive tape, "181A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M"for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Crimp joints for round metal ducts shall have a contact lap of at least 1 1/2 inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacture's installation instructions.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.

Reason (Part I): The purpose of this proposal is to create consistency between the IMC and the IRC. The residential requirement refers to "Closure Systems" rather than "Tapes and Mastics". The term "Closure systems" applies to all products used to seal these ducts rather than just "tapes and mastics" The use of term "Closure Systems" is a better term, since it does apply to anything used to seal these ducts and is UL 181 Listed.
Also, this proposal addresses sealing of metal ductwork. Sheet metal ducts are not specifically addressed in the current requirements, other than prohibiting the use of unlisted duct tape. Currently there does not exist any listing for closure system used for metal ductwork. This proposed change provides the requirement that the product must be installed in accordance with the manufactures recommended application and instructions. By requiring that they be used in accordance with manufactures recommended application, the product must be intended to be used to seal metal ducts by the manufacturer.

Reason (Part II): The purpose of this proposal is to create consistency between the IMC and the IRC. This proposal addresses sealing of metal ductwork. Sheet metal ducts are not specifically addressed in the current requirements, other than prohibiting the use of unlisted duct tape. Currently there does not exist any listing for closure system used for metal ductwork. This proposed change provides the requirement that the product must be installed in accordance with the manufactures recommended application and instructions. By requiring that they be used in accordance with manufactures recommended application, the product must be intended to be used to seal metal ducts by the manufacturer.

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

PART I – IMC

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

PART II – IRC-M

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

M80–07/08
603.9; IRC M1601.3.1

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

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

603.9 (Supp) Joints, seams and connections. All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC *Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams, and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants, or tapes. Tapes and mastics used to seal ductwork listed and labeled in accordance with UL 181A shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or"181 A-H" for heat-sensitive tape. Tapes and mastics used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Unlisted duct tape is not permitted as a sealant on any metal ducts.

> **Exception:** Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2-inches of water column (500 Pa) pressure classification shall not require additional closure systems.

PART II – IRC-M

M1601.3.1 (Supp) Joints and seams. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other approved closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL181A and shall be marked "181A-P" for pressure-sensitive tape, "181A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M"for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Crimp joints for round metal ducts shall have a contact lap of at least 1 1/2 inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2-inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Reason: According to SMACNA Table 1-2, these types of joints are exempt from the sealing requirements. This should have been included in the original IRC and IMC change.

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

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

M81–07/08
603.17.3

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

Delete without substitution:

~~**603.17.3 (Supp) Air dispersion systems.** Air dispersion systems shall be exposed in the space that is being conditioned by the system and shall be operated under positive pressure. Air dispersion systems shall not pass through fire-resistance-rated assemblies. Air dispersion systems shall be listed and labeled.~~

Reason: This was M-98 last code change cycle. The original proposal included a standard for these systems. However the standard did not comply with ICC criteria. So the proponent deleted the standard reference instead of going back and adjusting the standard. Now we have a system in the code text with no reference standard to verify compliance. Chapter 3 requires listing and labeling and so does this text. What does this system have to be listed to? This is totally out of the concept the I Codes attempt to stay within, the text can not require something to be listed and labeled but never reference listed to what.

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

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

M82–07/08
604.2 (New)

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

Add new text as follows:

604.2 Duct and plenum insulation, where required. Supply and return air ducts and plenums shall be insulated with insulation having an *R*-value of not less than R-5 where located in unconditioned spaces and an *R*-value of not less than R-8 where located outside of the building. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by insulation having an *R*-value of not less than R-8.

Exceptions:

1. Where located within equipment and appliances.
2. Where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

(Renumber subsequent sections)

Reason: This is extracted from IECC Section 503.2.7 and needs to be included here in the IMC. Section 604 tells us everything except where insulation is required. It would be appropriate for inspectors and installers to have this information readily available in this document and not have to locate a second code to come up with the answer. There is no new language here and this added text would make 604 a little more complete.

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

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

M83–07/08
604.4, 604.11

Proponent: Kurt Riesenberg, Spray Polyurethane Foam Alliance (SPFA)

Revise as follows:

604.4 Foam plastic insulation. Foam plastic used as duct coverings and linings shall conform to the requirements of Section 604.

Exception: Spray polyurethane foam spray-applied to the exterior of ducts in attics and crawl spaces in compliance with all of the following:

1. The flame–spread index of the foam plastic is not greater than 25 and the smoke-developed index is not greater than 450 at the specified installed thickness.
2. The foam plastic is protected in accordance with the ignition barrier requirements of Section 2603 of the *International Building Code*.
3. Where used in an air plenum, the spray foam plastic shall meet the requirements of Section 604.3

604.11 Vapor retarders. Where Ducts used for cooling are externally insulated, the insulation shall be covered with a vapor retarder having a maximum permeance of 0.05 perm [(2.87 ng/(Pa · s · m^2)] or aluminum foil having a minimum thickness of 2 mils (0.051) mm). Insulations having a permenace of 0.05 perm [(2.87 ng/(Pa · s · m^2)] or less shall not be required to be covered. Closed-cell spray polyurethane foam with a minimum closed-cell content of 90% and maximum permeance of 3 perm-inch [(1722 ng/(Pa · s · m^2)] at the installed thickness shall not be required to be covered with a vapor retarder. All joints and seams shall be sealed to maintain the continuity of the vapor retarder except where the insulation is spray polyurethane foam or other insulation with joint sealing capability.

Reason: Add new material for current provision of the IMC. Spray Polyurethane foam is currently not recognized for HVAC duct insulation by the IMC but is currently recognized by the 2006 IRC for this application when protected by an ignition barrier. Spraying over ducts is an addition that will simultaneously produce continuous insulation, improve energy efficiency, and provide air leakage control to the duct system from the duct exterior. Section 719.7 of the 2006 IBC permits the use of exposed insulation and covering on pipe and tubing when the insulation and covering has a flame spread index of not more than 25 and the smoke developed index of not more than 450.

Vapor retarder films are required for highly moisture permeable insulations. Without vapor retarders, these insulations will develop interstitial condensation which reduces thermal performance, increases the probability of mold and mildew growth, and can cause structural degradation of the surrounding materials. Interstitial spaces are a major avenue for penetration of water vapor or wicking or trapping of bulk water in insulation. Closed-cell spray foam, with 90% closed cell content, has minimal susceptibility to interstitial condensation from high levels of moisture in the surrounding atmosphere. The cells are closed, with adjacent cells sharing the same cell wall, thus minimizing intestinal spaces and enhancing insulation performance. Moreover, the vapor permeability of closed-cell Spray Polyurethane foam has proven sufficient in numerous applications where it has been successfully sprayed within cavity walls onto exterior wall sheathing and over hidden cavity wall ducts without vapor retarders. In addition, closed-cell SPF has a long history of successful performance in cold-storage buildings located in hot-moist climates, with no additional vapor retarders added. The application of Spray Polyurethane foam on ducts will improve energy efficiency and reduce duct air leakage.

This current proposal has been accepted by the IRC and IECC. SPFA proposes this code change which addresses the concerns that led to disapproval in the IMC code last cycle and promotes harmonization of the I-Codes.

Bibliography:

International Residential Code, Section R314.5.11 permits Spray Polyurethane Foam plastic to be applied to the sill plate and header in crawl spaces and basements.

1990 and 1995 National Building Code of Canada, Section 9.25.6.3 and Section A-9.25.4.2.(2) recognizes low permeance foam plastic insulation without vapor barrier protection.

2005 ASHRAE *Handbook - Fundamentals*, page 26.8 'Vapor Retarders', Atlanta, GA 2005, an ASHRAE reference on insulation for mechanical systems, states "In addition, some insulation materials (e.g., closed-cell foam materials with low water vapor permeability) are considered vapor retarders in themselves without any additional vapor retarding membrane".

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

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

M84–07/08
607.5.5.1 (New)

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

Add new text as follows:

[B] 607.5.5.1 Enclosure at the bottom. Shaft enclosures that do not extend to the bottom of the building or structure, shall be protected in accordance with Section 707.11 of the *International Building Code*.

Reason: The mechanical inspector needs to be aware of this requirement when looking into a shaft with no bottom. Currently this is not referenced in the IMC.

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

Analysis: Section 607 of the IMC is under the purview of the IBC Fire Safety committee, however, this proposal is on the IMC committee agenda because the proposal is simply a reference to the IBC provisions and it is at the discretion of the IMC committee to add such new text.

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

M85-07/08
701.2 (New)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee

Add new text as follows:

701.2 Combustion and ventilation air. Combustion and ventilation air for furnace and boiler rooms in Group I-2 occupancies shall be brought in from and discharged directly to the outdoors.

Reason: This proposal will provide that the intake and exhaust from the heater and boiler rooms are not mixed with the ventilation for the remainder of the facility. It is intended to provide this separation of air throughout these facilities so that the quality of air within the facility is not hindered by the operation of the heater and boiler.

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

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

M86–07/08
801.2

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

Revise as follows:

801.2 General. Every fuel-burning appliance shall discharge the products of combustion to a vent, factory-built chimney or masonry chimney, except for appliances vented in accordance with Section 804. The chimney or vent shall be designed for the type of appliance being vented.

Exception: Appliances vented by a Type I hood installed in accordance with Section 507.

Reason: Type I hoods when installed in accordance with this code are quite capable of exhausting products of combustion from a variety of fuel sources such as wood burning char-broilers. Some appliances do not necessarily need a factory built chimney. This section currently doesn't recognize this practice.

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

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

M87–07/08
913.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

913.1 General. Clothes dryers shall be installed in accordance with the manufacturer's installation instructions. Electric residential clothes dryers shall be tested in accordance with ~~an approved test standard.~~ UL 2158. Electric coin-operated clothes dryers shall be tested in accordance with UL 2158. Electric commercial clothes dryers shall be tested in accordance with UL 1240. ~~Electric coin-operated clothes dryers shall be tested in accordance with UL 2158.~~

Reason: Provides the approved test Standard for residential clothes dryers and rearranges the section to read more clearly.

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

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

M88–07/08
918.6; IRC M1602.2; IFGC 618.5

Proponents: Jim Weiler, Pueblo County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO); Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC, THE IRC MECHANICAL AND THE IFGC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

918.6 Prohibited sources. Outdoor or return air for a forced-air heating system shall not be taken from the following locations:

1. Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outdoor air inlet.
2. Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm)above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
3. A hazardous or insanitary location or a refrigeration machinery room as defined in this code.
4. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Sections 918.2 and 918.3, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

   Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

5. A closet, bathroom, toilet room, kitchen, garage, mechanical room, boiler room ~~or~~ furnace room, attic or crawl space.
6. A room or space containing a fuel-burning appliance where such room or space serves as the sole source of return air.

   Exceptions:

   1. This shall not apply where the fuel-burning appliance is a direct-vent appliance.

2. This shall not apply where the room or space complies with the following requirements:
   2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuel-burning appliances therein.
   2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.
   2.3. Return-air inlets shall not be located within 10 feet (3048 mm)of any appliance firebox or draft hood in the same room or space.
3. This shall not apply to rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm)from the firebox of such appliances.

Reason: There are times when it is required to heat a crawl space for various reasons but installing a return air duct doesn't mean it is fully conditioned. There are good reasons not to do this. Mold, odors and insects just to name a few. The IMC doesn't specifically prohibit this situation although implied. This language will clarify that this should not occur.

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

PART II – IRC-M

Revise as follows:

M1602.2 Prohibited sources. Outdoor and return air for a forced-air heating or cooling system shall not be taken from the following locations:

1. Closer than 10 feet (3048 mm) to an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.
2. Where flammable vapors are present; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
3. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with ACCA Manual D, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

   Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

4. A closet, bathroom, toilet room, kitchen, garage, mechanical room, furnace room<u>, attic, crawl space,</u> or other dwelling unit.
5. A room or space containing a fuel-burning appliance where such room or space serves as the sole source of return air.

   Exceptions:

   1. The fuel-burning appliance is a direct-vent appliance or an appliance not requiring a vent in accordance with Section M1801.1 or Chapter 24.
   2. The room or space complies with the following requirements:
      2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuel-burning appliances therein.
      2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.
      2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of any appliance firebox or draft hood in the same room or space.
   3. Rooms or spaces containing solid-fuel burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.

Reason: There are times when it is required to heat a crawl space for various reasons but installing a return air duct doesn't mean it is fully conditioned. There are good reasons not to do this. Mold, odors and insects just to name a few. The IRC doesn't specifically prohibit this situation although implied. This language would clarify that this should not occur

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

PART III – IFGC

Revise as follows:

618.5 Prohibited sources. Outside or return air for a forced-air heating system shall not be taken from the following locations:

1. Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.
2. Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
3. A hazardous or insanitary location or a refrigeration machinery room as defined in the *International Mechanical Code*.
4. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Section 618.2, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

   Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

5. A room or space containing an appliance where such a room or space serves as the sole source of return air.

   Exception: This shall not apply where:

   1. The appliance is a direct-vent appliance or an appliance not requiring a vent in accordance with Section 501.8.
   2. The room or space complies with the following requirements:
      2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuel-burning appliances therein.
      2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.
      2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of any appliance firebox or draft hood in the same room or space.
   3. Rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.

6. A closet, bathroom, toilet room, kitchen, garage, mechanical room, boiler room ~~or~~ furnace room<u>, attic, or crawl space</u>.

Reason: There are times when it is required to heat a crawl space for various reasons but installing a return air duct doesn't mean it is fully conditioned. There are good reasons not to do this. Mold, odors and insects just to name a few. The IFGC doesn't specifically prohibit this situation although implied. This language would clarify that this should not occur.

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

PART I – IMC

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

PART II – IRC-M

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

PART III – IFGC

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

M89–07/08
927 (New), 927.1 (New), 927.2 (New), Chapter 15 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Add new text as follows:

SECTION 927
HEAT RECOVERY VENTILATORS

927.1 Ducted heat recovery ventilators. Ducted heat recovery ventilators shall be listed and labeled in accordance with UL 1812.

927.2 Non-ducted heat recovery ventilators. Non-ducted heat recovery ventilators shall be listed and labeled in accordance with UL 1815.

2. Add standards to Chapter 15:

UL

1812-05	Standard for Ducted Heat Recovery Ventilators--with revisions through January 2006
1815-01	Standard for Nonducted Heat Recovery Ventilators--with revisions through January 2006

Reason: The IECC requires heat recovery equipment. This provides the information needed to the IMC.

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

Analysis: A review of the standard proposed for inclusion in the code, UL 1812-05 and UL 1815-01, 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 January 15, 2008.

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

M90–07/08
1003.1

Proponent: Jeffrey M. Shapiro, PE, international Code Consultants, representing Steel Tank Institute

Revise as follows:

1003.1 General. All pressure vessels shall be constructed in accordance with the ASME *Boiler and Pressure Vessel Code* and shall bear the label of an approved agency and shall be installed in accordance with the manufacturer's installation instructions.

Reason: Although the ASME Boiler and Pressure Vessel Code is the nationally recognized general standard for construction of pressure vessels, there is no direct link to this standard as a basis for constructing pressure vessels. The shortcoming of such a general reference for pressure vessel construction was noted in a recent U.S. Chemical Safety Board report on a 2004 explosion at Marcus Oil in Houston, Texas.

Likewise, a similar reference is also missing for vessels that contain hazardous materials, which are regulated in the IFC. A separate proposal has been submitted to the IFC to accomplish that change.

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

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

M91–07/08
1101.10 (New); IRC M1411.6 (New)

Proponent: Mona Casey, Naples, FL

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps.

PART II – IRC

Add new text as follows:

M1411.6 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps.

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 the lethal chemical Chlorofluorocarbons (CFCs/Freon) by untrained and unlicensed individuals, including children.

Because the lethal chemical Freon is easily accessible, "huffing", which refers to the inhalation of Freon and other dangerous chemicals, has been on the rise over the past few years not only among pre-teens and teenagers but among adults as well. Freon is highly addictive and is considered a gateway drug because users often progress from inhalants to illegal drugs and alcohol.

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.

The modification of this code will:

- Seal service valve to prevent leaks
- Prevent excessive energy usage due to refrigerant loss
- Help prevent illegal venting of refrigerant
- Support every EPA management program
- Help prevent accidental mixing of refrigerant
- Deter refrigerant theft at unsecured sites
- Help prevent access by unauthorized persons
- Help prevent loss from cylinders and recovery tanks
- Reduce potential liability for inhalation induced injury or death

Cost Impact: The code change proposal will increase the cost of construction. The current cost of this locking refrigerant cap based on the companies I contacted ranges from $20-$30 per pair (installation not included).

PART I – IMC

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

PART II – IRC

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

M92–07/08
1101.10.1 (New); IRC M1411.7 (New)

Proponent: Mona Casey, Naples, FL

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

1101.10.1 Existing HVAC systems. Refrigerant circuit access ports located outdoors in existing systems shall be retrofitted with locking-type tamper-resistant caps within [ ] years of adoption of this code.

PART II – IRC

Add new text as follows:

M1411.7 Existing HVAC systems. Refrigerant circuit access ports located outdoors in existing systems shall be retrofitted with locking-type tamper-resistant caps within [ ] years of adoption of this code.

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 the lethal chemical Chlorofluorocarbons (CFCs/Freon) by untrained and unlicensed individuals, including children.

Because the lethal chemical Freon is easily accessible, "huffing", which refers to the inhalation of Freon and other dangerous chemicals, has been on the rise over the past few years not only among pre-teens and teenagers but among adults as well. Freon is highly addictive and is considered a gateway drug because users often progress from inhalants to illegal drugs and alcohol.

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- 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.
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- Help prevent accidental mixing of refrigerant
- Deter refrigerant theft at unsecured sites
- Help prevent access by unauthorized persons
- Help prevent loss from cylinders and recovery tanks
- Reduce potential liability for inhalation induced injury or death

Cost Impact: The code change proposal will increase the cost of construction. The current cost of this locking refrigerant cap based on the companies I contacted ranges from $20-$30 per pair (installation not included).

Analysis: The proposal includes an "effective date" which is typically not included in the I-Codes. Typically the provisions in the code become effective when the code is adopted.

PART I – IMC

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

PART II – IRC-M

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

M93–07/08
Table 1103.1

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

Revise as follows:

[F]Table 1103.1 (Supp)
REFRIGERANT CLASSIFICATION, AMOUNT AND TLV-TWA
as approved by the American Society of Heating Refrigerating and Air-Conditioning Engineers and Revised 2004

Chemical Refrigerant	Formula	Chemical Name of Blend	Hazard Categories[a]	Refrigerant Classification	Degrees of Hazard[b]	[[M]] Amount Of Refrigerant Per Occupied Space			
						Pound per 1,000 cubic feet	ppm	g/m3	OELf TLV-TWA[f] ~~(ppm)~~
R-11[e]	CCl_3F	trichlorofluoromethane	OHH	A1	2-0-0[c]	0.39	1,100	6.2	C1,000
R-12[e]	CCl_2F_2	dichlorodifluoromethane	CG,OHH	A1	2-0-0[c]	5.6	18,000	90	1,000
R-13[e]	$CClF_3$	chlorotrifluoromethane	CG,OHH	A1	2-0-0[c]	~~18~~	~~67,000~~	~~290~~	1,000
R-13B1[e]	$CBrF_3$	bromotrifluoromethane	CG,OHH	A1	2-0-0[c]	~~22~~	~~57,000~~	~~350~~	1,000
R-14	CF4	tetrafluoromethane (carbon tetrafluoride)	CG,OHH	A1	2-0-0[c]	25	110,000	400	1,000
R-22	$CHClF_2$	chlorodifluoromethane	CG,OHH	A1	2-0-0[c]	13	59,000	210	1,000
R-23	CHF_3	trifluoromethane (fluoroform)	CG,OHH	A1	2-0-0[c]	7.3	41,000	120	1,000
R-32	CH_2F_2	difluoromethane (methylene fluoride)	CG,F,OHH	A2	—	4.8	36,000	77	1,000
R-113[e]	CCl_2FCClF_2	1, 1,2-trichloro-1,2,2-trifluoroethane	OHH	A1	2-0-0[c]	1.2	2,600	20	1,000
R-114[e]	$CClF_2CClF_2$	1,2-dichloro-1,2,2-tetrafluoroethane	CG,OHH	A1	2-0-0[c]	8.7	20,000	140	1,000
R-115	$CClF_2CF_3$	chloropentafluoroethane	CG,OHH	A1		47	120,000	760	1,000
R-116	CF_3CF_3	hexafluoroethane	CH,OHH	A1	1-0-0	34	97,000	550	1,000
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	OHH	B1	2-0-0[c]	3.5	9,100	57	50
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	CG,OHH	A1	2-0-0[c]	3.5	10,000	56	1,000
R-125	CHF_2CF_3	pentafluoroethane	CG,OHH	A1	2-0-0[c]	23	75,000	370	1,000
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	CG,OHH	A1	2-0-0[c]	13	50,000	210	1,000
R-141b	CH_3CCl_2F	1,1-dichlro-1-fluoroethane	CG,OHH			0.78	2,600	12	
R-142b	CH_3CClF_2	1-chloro-1,1-	CG,OHH	A2		5.1	20,000	83	1,000

Chemical Refrigerant	Formula	Chemical Name of Blend	Hazard Cateogries[a]	Refrigerant Classification	Degrees of Hazard[b]	[[M]] Amount Of Refrigerant Per Occupied Space			
						Pound per 1,000 cubic feet	ppm	g/m3	OELf ~~TLV-TWA[f] (ppm)~~
		difluoroethane							
R-143a	CH_3CF_3	1,1,1-trifluoroethane	CG,F,OHH	A2	2-0-0[c]	4.5	21,000	70	1,000
R-152a	CH_3CHF_2	1,1-difluorethane	CG,F,OHH	A2	1-4-0	2.0	12,000	32	1,000
R-170	CH_3CH_3	ethane	CG,F,OHH	A3	2-4-0	0.54	7,000	8.7	1,000
R-E170	CH_3OCH_3	dimethly ether	CG,F,OHH	A3		1.0	8,500	16	1,000
R-218	$CF_3CF_2CF_3$	octafluoropropane	CG,OHH	A1	2-0-0[c]	43	90,000	690	1,000
R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoroporpane	CG,OHH	A1		36	84,000	580	1,000
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	CG,OHH	A1	2-0-0[c]	21	55,000	340	1,000
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	CG,OHH	B1	2-0-0[c]	12	34,000	190	300
R-290	$CH_3CH_2CH_3$	propane	CG,F,OHH	A3	2-4-0	0.56	5,300	9.5	2,500
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	CG,OHH	A1		41	80,000	660	1,000
R400[e]	zeotrope	R-12/114 (50/50)	CG,OHH	A1	2-0-0[c]	10	28,000	160	—
R-400[e]	zeotrope	R-12/114 (60/40)	CG,OHH	A1		11	30,000	170	
R-401A	zeotrope	R-22/152a/124 (53/13/34)	CG,OHH	A1	2-0-0[c]	6.6	27,000	110	1,000
R-401B	zeotrope	R-22/152a/124 (61/11/28)	CG,OHH	A1	2-0-0[c]	7.2	30,000	120	1,000
R-401C	zeotrope	R-22/152a/124 (33/15/52)	CG,OHH	A1	2-0-0[c]	5.2	20,000	84	—
R-402A	zeotrope	R-125/290/22 (60/2/38)	CG,OHH	A1	2-0-0[c]	8.5	33,000	140	1,000
R-402B	zeotrope	R-125/290/22 (38/2/60)	CG,OHH	A1	2-0-0[c]	15	63,000	240	1,000
R-403A	zeotrope	R-290/22/218 (5/75/20)	CG,OHH	A1	2-0-0[c]	7.6	33,000	120	1,000
R-403B	zeotrope	R-290/22/218 (5/56/39)	CG,OHH	A1	2-0-0[c]	18	70,000	290	1,000
R-404A	zeotrope	R-125/143a/134a (44/52/4)	CG,OHH	A1	2-0-0[c]	31	130,000	500	1,000
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/2.5)	CG,OHH			16	57,000	260	1,000
R-406A	zeotrope	R-22/600a/142b (55/4/41)	CG,F,OHH	A2	—	4.7	21,000	25	1,000
R-407A	zeotrope	R-32/125/134a (20/40/40)	CG,OHH	A1	2-0-0[c]	18	78,000	290	1,000
R-407B	zeotrope	R-32/125/134a (10/70/20)	CG,OHH	A1	2-0-0[c]	20	77,000	320	1,000
R-407C	zeotrope	R-32/125/134a (23/25/52)	CG,OHH	A1	2-0-0[c]	17	76,000	270	1,000
R-407D	zeotrope	R-32/125/134a (15/15/70)	CG,OHH	A1	2-0-0[c]	15	65,000	240	1,000
R-407E	zeotrope	R-32/125/134a (25/15/60)	CG,OHH	A1	2-0-0[c]	16	75,000	260	1,000
R-408A	zeotrope	R-125/143a/22 (7/46/47)	CG,OHH	A1	2-0-0[c]	21	95,000	340	1,000
R-409A	zeotrope	R-22/124/142b (60/25/15)	CG,OHH	A1	2-0-0[c]	7.1	29,000	110	1,000
R-409B	zeotrope	R-22/124/142b (65/25/10)	CG,OHH	A1	2-0-0[c]	7.3	30,000	120	—
R-410A	zeotrope	R-32/125 (50/50)	CG,OHH	A1	2-0-0[c]	25	130,000	390	1,000
R-410B	zeotrope	R-32/125 (45/55)	CG,OHH	A1	2-0-0[c]	24	130,000	390	—
R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	CG,F,OHH	A2	—	2.9	14,000	46	1,000
R-411B	zeotrope	R-1270/22/152a (3/94/3)	CG,F,OHH	A2	—	2.8	13,000	45	1,000
R-412A	zeotrope	R-22/318/142b (70/5/25)	CG,F,OHH	A2	—	5.1	22,000	82	1,000
R-413A	zeotrope	R-218/134a/600a (9/88/3)	CG,F,OHH	A2	—	5.8	22,000	94	—
R-414A	zeotrope	R-22/124/600a/142b (51/28.5/4/16.5)	CG,OHH	A1	—	6.4	26,000	100	1,000
R-414B	zeotrope	R-22/124/600a/142b (50/39/1.5/9.5)	CG,OHH	A1	—	6.0	23,000	95	—
R-415A	zeotrope	R-22/152a (82.0/18.0)	CG,F,OHH	A2		12	57,000	190	
R-415B	zeotrope	R-22/152a (25.0/75.0)	CG,F,OHH	A2		9.3	52,000	120	1,000
R-416A	zeotrope	R-134a/124/600 (59/39.5/1.5)	CG,OHH	A1	2-0-0[c]	3.9	14,000	62	—
R-417A	zeotrope	R-125/134a/600 (45.5/50/3.5)	CG,OHH	A1	2-0-0[c]	3.5	13,000	56	1,000
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	CG,F,OHH	A2	—	13	59,000	200	
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	CG,F,OHH	A2	—	19	70,000	310	
R-420A	zeotrope	R-134a/142b (88.0/12.0)	CG,OHH	A1	2-0-0[c]	12	45,000	190	1,000
R-421A	zeotrope	R-125/134a(58.0/42.0)	CG,OHH	A1	2-0-0[c]	17	61,000	280	1,000
R-421B	zeotrope	R-125/134a (85.0/15.0)	CG,OHH	A1	2-0-0[c]	21	69,000	330	1,000
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	CG,OHH	A1	2-0-0[c]	18	63,000	290	1,000
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	CG,OHH	A1	2-0-0[c]	16	26,000	250	1,000
R-422C	zeotrope	R-125/134a/600a	CG,OHH	A1	2-0-0[c]	18	62,000	290	1,000

Chemical Refrigerant	Formula	Chemical Name of Blend	Hazard Cateogries[a]	Refrigerant Classification	Degrees of Hazard[b]	[[M]] Amount Of Refrigerant Per Occupied Space			
						Pound per 1,000 cubic feet	ppm	g/m3	OELf TLV-TWA[f] (ppm)
		(82.0/15.0/3.0)							
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	CG,OHH	A1	2-0-0[c]	16	58,000	260	1,000
R-423A	zeotrope	R-134a227ea (52.5/47.5)	CC,OHH			2-0-0[c]	19	59,000	310
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/1.0/0.6)	CG,OHH	A1	2-0-0[c]	6.2	23,000	100	1,000
R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	CG,OHH	A1	2-0-0[c]	16	67,000	250	1,000
R-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	CG,OHH	A1		5.2	20,000	83	990
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	CG,OHH	A1		18	76,000	280	1,000
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	CG,OHH	A1		23	83,000	370	1,000
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	CG,F,OHH	A3		0.81	6,300	13	
R-430A	zeotrope	R-152a/600a76.0/24.0)	CG,F,OHH	A3		1.3	8,000	21	
R-431A	zeotrope	R-290/152a (71.0/29.0)	CG,F,OHH	A3		0.69	5,500	11	
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	CG,F,OHH	A3		0.13	1,200	2.1	
R-433A	zeotrope	R-1270/290 (30.0/70.0)	CG,F,OHH	A3		0.34	3,100	5.5	
R-500e	azeotrope	R-12/152a (73.8/26.2)	CG,OHH	A1	2-0-0c	7.6	30,000	120	1,000
R-501[e]	azeotrope	R-22/12 (75.0/25.0)	CG,OHH	A1		13	54,000	210	
R-502e	azeotrope	R-22/115 (48.8/51.2)	CG,OHH	A1	2-0-0c	21	73,000	330	1,000
R-503e	azeotrope	R-23/13 (40.1/59.9)	CG,OHH	~~A1~~	2-0-0c	15	67,000	240	1,000
R-504[e]	azeotrope	R-32/115 (48.2/51.8)	CG,OHH				29	140,000	460
R-507A	azeotrope	R-125/143a (50/50)	CG,OHH	A1	2-0-0c	32	130,000	520	1,000
R-508A	azeotrope	R-23/116 (39/61)	CG,OHH	A1	2-0-0c	14	55,000	220	1,000
R-508B	azeotrope	R-23/116 (46/54)	CG,OHH	A1	2-0-0c	13	52,000	200	1,000
R-509A	zeotrope	R-22/218 (44/56)	CG,OHH	A1	2-0-0c	24	75,000	390	1,000
R-600	CH3CH2CH2CH3	butane	CG,F,OHH	A3	1-4-0	—	—	—	800
R-600a	CH(CH3)2-CH3	isobutane (2-methyl propane)	CG,F,OHH	A3	2-4-0	0.6	4000	9.6	800
R-601a	$(CH_3)_2CHCH_2CH_3$	isopentane	CG,F,OHH	A3		0.2	1000	2.9	600
R-717	NH3	ammonia	CG,C,F,OHH	B2	3-3-0[d]	0.014	320	0.22	25
R-718	H2O	water	—	A1	0-0-0	—	— — —		
R-744	CO2	carbon dioxide	CG,OHH	A1	2-0-0[c]	4.5	40,000	72	5,000
R-1150	CH2=CH2	ethene (ethylene)	CG,F,OHH	A3	1-4-2	~~0.38~~	~~5,200~~	~~6.0~~	1,000
R-1270	CH3CH=CH2	Propene (propylene)	CG,F,OHH	A3	1-4-1	0.1	1,000	1.7	660

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

a. CG = Compressed gas; C = Corrosive; F = Flammable; OHH = Other Health Hazard.
b. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.
c. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.
d. For installations that are entirely outdoors, use 3-1-0.
e. Class I ozone depleting substance; prohibited for new installations.
f. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the AIHA WEEL or consistent value on a time-weighted average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.

Reason: This proposal will update Table 1103.1 to be consistent with ASHRAE Standard 34-2007, and add new refrigerants for which ASHRAE Standard 34-2007 has given a designation and safety classification.

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

Analysis: The new language added to the title of the table appears to be an attribution statement. This is normally found in the commentary.

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

M94–07/08
Table 1103.1

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

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise table as follows:

Delete column "Hazard Categories" and Footnote "a":

[F] TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND TLV-TWA

Refrigerant	Chemical Formula	Chemical Name or Blend	~~Hazard Categories~~	Refrigerant Classification	Degrees of Hazard	Pounds per 1000 cubic feet	ppm	g/m3	TLV-TWA (ppm)

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m3.
~~a. CG = Compressed gas; C = Corrosive; F = Flammable; OHH = Other Health Hazard.~~

(Renumber subsequent footnotes)

(Portions of table and footnotes not shown remain unchanged)

Reason: The classifications provided in the "hazard categories" column of the table are of no value from a code application or enforcement perspective and should be deleted. All of the listed refrigerants, with the exception of water, are compressed gases, which is common knowledge, and all are shown as "other health hazard." The classification category "other health hazard," which appeared in earlier editions of the model fire and building codes, wasn't carried forward into the ICC codes, except here. Therefore, it is of no value.

With respect to the "corrosive" classification, there are no regulations for corrosive refrigerants in the IMC, and with respect to the "flammable" classification, the IMC regulates flammability based on refrigerant classifications under ASHRAE 34.

Leaving these classifications in the table unnecessarily creates questions and confusion in the minds of code users regarding why this information has been provided, so it would be best to simply delete it.

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

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

M95–07/08
1104.2.2

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

Revise as follows:

1104.2.2 Industrial occupancies and refrigerated rooms. This section applies only to industrial occupancies and refrigerated rooms for manufacturing, food and beverage preparation, meat cutting, other processes and storage. Machinery rooms are not required where all of the following conditions are met:

1. The space containing the machinery is separated from other occupancies by tight construction with tight-fitting doors.
2. Access is restricted to authorized personnel.
3. The floor area per occupant is not less than 100 square feet (9.3 m2) where machinery is located on floor levels with exits more than 6.6 feet (2012 mm) above the ground. Where provided with egress directly to the outdoors or into approved building exits, the minimum floor area shall not apply.
4. Refrigerant detectors are installed as required for machinery rooms in accordance with Section 1105.3.
5. Surfaces having temperatures exceeding 800°F (427°C) and open flames are not present where any Group A2, B2, A3 or B3 refrigerant is used (see Section 1104.3.4).

6. All electrical equipment and appliances conform to Class 1, Division 2, hazardous location classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant, other than ammonia, in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.
7. All refrigerant-containing parts in systems exceeding 100 hp (74.6 kW) drive power, except evaporators used for refrigeration or dehumidification; condensers used for heating; control and pressure relief valves for either; and connecting piping, shall be located either outdoors or in a machinery room.

Reason: Consistency with ASHRAE 15, Section 7.2.2, Item 6. The IMC recognizes ASHRAE 15 as the industry standard for refrigeration safety, and although there are some cases where the code deliberately differs from the standard, this is not one of those cases.

Research into the history of this section revealed that the current text of Item 6 was inserted into the IMC in 1998 based on changes processed in 1996. Code Change Proposal M147-96 was submitted by the Air-Conditioning and Refrigeration Institute as a general clean-up of provisions that had been derived from ASHRAE 15, and no technical basis was offered for any consequential change to the provisions. The stated reason for this code change was:

"These changes will relocate mandatory provisions from notes in tables to code text and reorganize affected provisions into a more logical sequence, to facilitate understanding and use. Although no effort was made to preserve the structure of either the "table notes" from Tables 1103 and 1104(1) of the IMC or the "rule" approach from Standard 15 (on which the notes were based), the revision preserves the essence of these requirements. The following tables summarize the relocations by provision…"

In the table that followed, there was no entry for Section 1104.2.2 (the section being questioned here) to indicate where the source text was derived from. Thereby, there was no justification for making any change beyond coordination with ASHRAE 15. It is also interesting to note that in the staff analysis for this proposal, there was a specific statement indicating that staff did not evaluate the technical accuracy of the proposal.

Accordingly, because ASHRAE 15 excludes ammonia from the requirement for classified electrical equipment, recognizing that ammonia has a low propensity for ignition, there is no apparent reason for the IMC to take a different stance. Approval of this proposal will achieve coordination between the IMC and ASHRAE 15.

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

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

M96–07/08

1105.7.1 (New), 1105.7.2 (New), 1105.8

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

1. Add new text as follows:

1105.7.1 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 by means of treatment systems that reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDHL at the point of exhaust.

1105.7.2 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 or an approved flaring system designed to incinerate the entire charge in accordance with Section 606.12.5 of the *International Fire Code*

.

2. Revise as follows:

1105.8 Ammonia discharge. Pressure relief valves for ammonia systems shall discharge ~~in accordance with ASHRAE-15~~ to one or more of the following locations:

1. To the atmosphere in accordance with Section 1105.7
2. In a tank containing 1gallon of water for each pound of ammonia (8.3 liters per kg. of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge piping. Provisions shall be made to keep the water from freezing during discharge. Discharge piping from the pressure relief device shall distribute ammonia into the bottom of the tank but not lower than 33 feet (10 m) below the maximum liquid level. The tank shall be large enough to hold the required water plus the volume of ammonia discharged.
3. Other approved treatment systems

Reason: This is an effort to make Chapter 11 a little more complete. This language is extracted from ASHRAE-15 and none of the requirements differ from the standard. 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. Why not just say what is required for ammonia discharge rather than referring to the standard. This will aid in plan review as well as field inspection because the requirements will be right there in the chapter.

The IMC also lacks complete guidance as it relates to termination of refrigerant relief devices. It doesn't make sense to travel to three documents to find the complete picture of what is required. This language further builds and completes chapter 11 as it will be more convenient to have all the regulations in one place for inspectors and plan reviewers to utilize.

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

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

M97–07/08
1106.5

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

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

[F] 1106.5 Remote controls. Remote control of the mechanical equipment and appliances located in the machinery room shall be provided ~~as required by Section 606.9 of the International Fire Code~~ at an approved location immediately outside of the machinery room and adjacent to its principle entrance.

Reason: The IMC is unclear where exactly to place remote controls. This is extracted from the Fire Code and also completes 1106.5. There is no reason to reference the Fire Code as this section mirrors the Fire Code. This language further completes 1106.5.

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

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

M98–07/08
1107.2 (New), 1107.2.1 (New), 1107.2.2 (New)

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

Add new text as follows:

1107.2 Piping location. Refrigerant piping that crosses an open space that affords passageway in any building shall be not less than 7.25 feet (2.2 m) above the floor unless the piping is located against the ceiling of such space. Refrigerant piping shall not be placed in any elevator, dumbwaiter, or other shaft containing a moving object or in any shaft that has openings to living quarters or to means of egress. Refrigerant piping shall not be installed in an enclosed public stairway, stair landing or means of egress.

1107.2.1 Piping in concrete floors. Refrigerant piping installed in concrete floors shall be encased in pipe ducts. The piping shall be isolated and supported to prevent damaging vibration, stress and corrosion.

1107.2.2 Refrigerant penetrations. Refrigerant piping shall not penetrate floors, ceilings or roofs.

Exceptions:

1. Penetrations connecting the basement and the first floor
2. Penetrations connecting the top floor and a machinery penthouse or roof installation.
3. Penetrations connecting adjacent floors served by the refrigeration system

4. Penetrations by piping in a direct system where the refrigerant quantity does not exceed Table 1103.1 for the smallest occupied space through which the piping passes.
5. In other than industrial occupancies and where the refrigerant quantity exceeds Table 1103.1 for the smallest space, penetrations for piping that connects separate pieces of equipment that are either:
   5.1. Enclosed be an approved gas-tight, fire resistive duct or shaft with openings to those floors served by the refrigeration system or
   5.2. Located on the exterior of the building where vented to the outdoors or to the space served by the system and not used as an air shaft, closed court or similar space.

(Renumber subsequent sections)

Reason: Chapter 11 is incomplete as it relates to all the requirements for piping location, found in ASHRAE-15. These are some of the more important requirements that will aid inspectors and plan reviewers when utilizing only the IMC. There are no new requirements here, just further guidance extracted from the standard.

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

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

M99–07/08
1201.2

Proponent: Mark Riley, City of Troy, MI, representing the Mechanical Inspectors of Michigan

Revise as follows:

1201.2 ~~Pipe~~ Sizing. Piping ~~for~~ and piping system components for hydronic systems shall be sized for the demand of the system.

Reason: There is more to properly sizing a hydronic system than just sizing hydronic pipe. Pumps, coils, valves, and other appurtances must be correctly sized for the proper operation of the system. Failure to do so could also result equipment malfunction and damages.

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

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

M100–07/08
1201.2 (New), Chapter 15 (New)

Proponent: Walter J. Sperko, PE, Sperko Engineering, representing himself

1. Add new text as follows:

1201.2 Standards. As an alternative to the provisions of Sections 1202 and 1203, piping shall be designed, installed, inspected and tested in accordance with ASME B31.9. Where ASME B31.9 is followed, materials listed in Section 1202 shall be permitted to be used, and Sections 1203.1, 1203.2 and 1203.15 shall apply.

(Renumber subsequent sections)

2. Add standard to Chapter 15 as follows:

ASME

B31.9-04 Building Services Piping

Reason: To incorporate ASME B31.9, *Building Services Piping*, into the IMC for hydronic piping.

ASME B31.9 is a recognized international standard for hydronic piping that was written specifically to provide a simplified piping code for use in design and installation of safe building services piping.

ASME B31.9 was first published in 1982 for the purpose of providing a thorough and comprehensive Code covering materials, design, installation, examination and testing for heating and air conditioning piping typically found in industrial, institutional, commercial, and public buildings, and in multi-unit residences. It was written because other long-established piping codes such as ASME B31.1, *Power Piping,* and B31.3, *Process Piping,* were too complex and expensive to follow for the lower temperatures and pressures and comparatively benign fluids used in buildings. B31.9 is intended to be applied to piping for water and anti-freeze solutions for heating and cooling, steam and steam condensate, air, liquids and other nontoxic, nonflammable fluids contained in piping not exceeding the following:

-Dimensional limits
Carbon steel: NPS 30 (DN 750) and 0.500 inches (12.7 mm) wall
Stainless steel: NPS 12 (DN 300) and 0.500 inches (12.7 mm) wall
Aluminum: NPS 12 (DN 300)
Brass and copper NPS 12 (DN 300), 12.125 in (308 mm) for copper tube.
Thermoplastics: NPS 24 (DN 600)
Ductile Iron: NPS 18 (DN 450)
Reinforced Thermosetting Resin: NPS 24 (DN 600)
-Pressure and temperature limits
Compressed air, steam and steam condensate to 1035 kPa (150 psi) gage
Steam and steam condensate from ambient to 186ºC (366ºF)
Other gases from ambient to -18 to 93ºC (0 to 200ºF)
Liquids to 2415 kPa (350 psi) gage and from -18 to 121ºC (0 to 250ºF)
Vacuum to 1 Bar (14.7 psi).

Cost Impact: Reduced. Most designers of larger facilities specify ASME B31.1, *Power Piping,* rather than B31.9, *Building Services Piping* making the cost of piping unnecessarily expensive.

Analysis: A review of the standard proposed for inclusion in the code, ASME B31.9-04, 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 January 15, 2008.

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

M101–07/08

1201.2 (New), 1202.1, 1202.2, 1202.3, 1202.4, Table 1202.4, 1202.5, Table 1202.5, 1202.6, 1203.3, 1203.3.1, 1203.3.2, 1203.3.3, 1203.3.4, 1203.3.5, 1203.3.6, 1203.3.7, 1203.3.8, 1203.3.8.1, 1203.3.8.2, 1203.4, 1203.5, 1203.6, 1203.7, 1203.8, 1203.8.1, 1203.8.2, 1203.9, 1203.10, 1203.10.1, 1203.11, 1203.11.1, 1203.11.2, 1203.12, 1203.13, 1203.14, Chapter 15

Proponent: Walter J. Sperko, PE, Sperko Engineering, representing himself

1. Add new text as follows:

1201.2 Standards. Piping in this chapter shall be designed, installed, inspected and tested in accordance with ASME B31.9 except as otherwise specified.

(Renumber subsequent sections)

2. Revise as follows:

1202.1 Piping. Piping material shall conform to the standards ~~cited in this section~~ listed in ASME B31.9 .

Exception: Embedded piping regulated by Section 1209.

1202.2 Used materials. Reused pipe, fittings, valves or other materials shall be clean and free of foreign materials ~~and shall be approved by the code official for reuse~~. Reused piping components shall be identified to a specification, grade or manufacturer's identification suitable for use in the system into which it will be installed as approved by the code official.

1202.3 Material ~~rating~~ suitability. ~~Materials shall be rated for the operating temperature and pressure of the hydronic system.~~ Materials shall be suitable for the type of fluid in the hydronic system. The exterior of the pipe shall be protected from corrosion and degradation.

1202.4 Piping materials standards. Hydronic pipe shall conform to the standards listed in ASME B31.9 or Table 1202.4. ~~The exterior of the pipe shall be protected from corrosion and degradation.~~

TABLE 1202.4 (Supp)
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
~~Acrylonitrile butadiene styrene (ABS) plastic pipe~~	~~ASTM D 1527; ASTM D 2282~~
~~Brass pipe~~	~~ASTM B 43~~
~~Brass tubing~~	~~ASTM B 135~~
~~Copper or copper alloy pipe~~	~~ASTM B 42; ASTM B 302~~
~~Copper or copper alloy tube (Type K, L or M)~~	~~ASTM B 75; ASTM B 88; ASTM B 251~~
~~Chlorinated polyvinyl chloride (CPVC) plastic pipe~~	~~ASTM D 2846; ASTM F 441; ASTM F 442~~
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	~~ASTM F 1281;~~ CSA CAN/CSA-B-137.10
~~Cross-linked polyethylene (PEX) tubing~~	~~ASTM F 876; ASTM F 877~~
Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges	AWWA C115/A21.5-05
~~Ductile iron pipe~~	~~AWWA C151/A21.51; AWWA C115/A21.15~~
Lead pipe	FS WW-P-325B
~~Polybutylene (PB) plastic pipe and tubing~~	~~ASTM D 3309~~
~~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~~
~~Polypropylene (PP) plastic pipe~~	~~ASTM F 2389~~
~~Polyvinyl chloride (PVC) plastic pipe~~	~~ASTM D 1785; ASTM D 2241~~
Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems	ASTM F 2389
~~Steel pipe~~	~~ASTM A 53; ASTM A 106~~
~~Steel tubing~~	~~ASTM A 254~~

1202.5 Pipe fittings. Hydronic pipe fittings shall be approved for installation with the piping materials to be installed, and shall conform to the respective pipe standards listed in ASME B31.9 or to the standards listed in Table 1202.5.

TABLE 1202.5 (Supp)
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~~
Ductile iron and gray iron	AWWA C110/A21.10
Ductile iron	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; ASTM F 2389
~~Steel~~	~~ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A 420~~

3. Delete without substitution:

~~**1202.6 Valves.** Valves shall be constructed of materials that are compatible with the type of piping material and fluids in the system. Valves shall be rated for the temperatures and pressures of the systems in which the valves are installed.~~

~~**1203.3 Joint preparation and installation.** When required by Sections 1203.4 through 1203.14, the preparation and installation of brazed, mechanical, soldered, solvent-cemented, threaded and welded joints shall comply with Sections 1203.3.1 through 1203.3.7.~~

~~**1203.3.1 Brazed joints.** Joint surfaces shall be cleaned. An approved flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.~~

~~**1203.3.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

~~**1203.3.3 Soldered joints.** Joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming toASTMB32.~~

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free of moisture. An approved primer shall be applied to CPVC and PVC pipe joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D 2235 for ABS joints.
2. ASTM F 493 for CPVC joints.
3. ASTM D 2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D 2846.

1203.3.5 Threaded joints. Threads shall conform to ASME B1.20.1. Schedule 80 or heavier plastic pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant, pipe-joint compound or tape shall be applied on the male threads only and shall be approved for application on the piping material.

1203.3.6 Welded joints. Joint surfaces shall be cleaned by an approved procedure. Joints shall be welded with an approved filler metal.

1203.3.7 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall conform to the requirements of ASTM F 1476 and shall be installed in accordance with the manufacturer's installation instructions.

1203.3.8 Mechanically formed tee fittings. Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.

1203.3.8.1 Full flow assurance. Branch tubes shall not restrict the flow in the run tube. A dimple/depth stop shall be formed in the branch tube to ensure that penetration into the outlet is of the correct depth. For inspection purposes, a second dimple shall be placed 0.25 inch (6.4 mm) above the first dimple. Dimples shall be aligned with the tube run.

1203.3.8.2 Brazed joints. Mechanically formed tee fittings shall be brazed in accordance with Section 1203.3.1.

1203.4 ABS plastic pipe. Joints between ABS plastic pipe or fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

1203.5 Brass pipe. Joints between brass pipe or fittings shall be brazed, mechanical, threaded or welded joints conforming to Section 1203.3.

1203.6 Brass tubing. Joints between brass tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3.

1203.7 Copper or copper-alloy pipe. Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, soldered, threaded or welded joints conforming to Section 1203.3.

1203.8 Copper or copper-alloy tubing. Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3 or flared joints conforming to Section 1203.8.1.

1203.8.1 Flared joints. Flared joints shall be made by a tool designed for that operation.

1203.8.2 (Supp) Push-fit joints. Push-fit joints shall be installed in accordance with the manufacturer's instructions.

1203.9 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

1203.10 Polybutylene plastic pipe and tubing. Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints conforming to Section 1203.3 or heat-fusion joints conforming to Section 1203.10.1.

1203.10.1 Heat-fusion joints. Joints shall be of the socket fusion or butt fusion type. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D3309.

1203.11 Cross-linked polyethylene (PEX) plastic tubing. Joints between cross-linked polyethylene plastic tubing and fittings shall conform to Sections 1203.11.1 and 1203.11.2. Mechanical joints shall conform to Section 1203.3.

~~**1203.11.1 Compression-type fittings.** When compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.~~

~~**1203.11.2 Plastic-to-metal connections.** Soldering on the metal portion of the system shall be performed at least 18 inches (457 mm) from a plastic-to-metal adapter in the same water line.~~

~~**1203.12 PVC plastic pipe.** Joints between PVC plastic pipe and fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.~~

~~**1203.13 Steel pipe.** Joints between steel pipe or fittings shall be mechanical joints that are made with an approved elastomeric seal, or shall be threaded or welded joints conforming to Section 1203.3.~~

~~**1203.14 Steel tubing.** Joints between steel tubing or fittings shall be mechanical or welded joints conforming to Section 1203.3.~~

(Renumber subsequent sections)

4. Add standard to Chapter 15 as follows:

ASME

B31.9-04 Building Services Piping

Reason: To incorporate ASME B31.9, *Building Services Piping*, into the IMC for hydronic piping.

ASME B31.9 is a recognized international standard for hydronic piping that was written specifically to provide a simplified piping code for use in design and installation of safe building services piping.

ASME B31.9 was first published in 1982 for the purpose of providing a thorough and comprehensive Code covering materials, design, installation, examination and testing for heating and air conditioning piping typically found in industrial, institutional, commercial, and public buildings, and in multi-unit residences. It was written because other long-established piping codes such as ASME B31.1, *Power Piping,* and B31.3, *Process Piping,* were too complex and expensive to follow for the lower temperatures and pressures and comparatively benign fluids used in buildings. B31.9 is intended to be applied to piping for water and anti-freeze solutions for heating and cooling, steam and steam condensate, air, liquids and other nontoxic, nonflammable fluids contained in piping not exceeding the following:

-Dimensional limits
- Carbon steel: NPS 30 (DN 750) and 0.500 inches (12.7 mm) wall
- Stainless steel: NPS 12 (DN 300) and 0.500 inches (12.7 mm) wall
- Aluminum: NPS 12 (DN 300)
- Brass and copper NPS 12 (DN 300), 12.125 in (308 mm) for copper tube.
- Thermoplastics: NPS 24 (DN 600)
- Ductile Iron: NPS 18 (DN 450)
- Reinforced Thermosetting Resin: NPS 24 (DN 600)

-Pressure and temperature limits
- Compressed air, steam and steam condensate to 1035 kPa (150 psi) gage
- Steam and steam condensate from ambient to 186ºC (366ºF)
- Other gases from ambient to -18 to 93ºC (0 to 200ºF)
- Liquids to 2415 kPa (350 psi) gage and from -18 to 121ºC (0 to 250ºF)
- Vacuum to 1 Bar (14.7 psi).

Cost Impact: Reduced. Most designers of larger facilities specify ASME B31.1, *Power Piping,* rather than B31.9, *Building Services Piping* making the cost of piping unnecessarily expensive.

Analysis: A review of the standard proposed for inclusion in the code, ASME B31.9-04, 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 January 15, 2008.

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

M102–07/08

1203.15.1, 1203.15.3, Chapter 15 (New)

Proponent: Walter J. Sperko, PE, Sperko Engineering Services, Inc., representing himself

1. Revise as follows:

1203.15.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, ~~fabricated~~ joined in accordance with ASTM D2657. 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 D3261.

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 D 2513~~ ASTM F1924.

2. Add standards to Chapter 15 as follows:

ASTM

D2657-07	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
D3261-03	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
F1924-05	Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing

Reason: To update and correct specifications referenced for polyethylene piping used for ground source heat pump loops systems. References are incorrect or inadequate.

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

Analysis: A review of the standards proposed for inclusion in the code, ASTM D2657, D3261 and F1924, 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 January 15, 2008.

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

M103–07/08

Table 1202.4, 1203.17 (New), 1203.17.1 (New), 1203.17.2 (New), Chapter 15 (New); IRC Table M2101.1, M2104.3 (New), M2104.3.1 (New), M2104.3.2 (New), Chapter 43 (New)

Proponent: Larry Gill, IPEX USA LLC

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

TABLE 1202.4 (Supp)
HYDRONIC PIPE

MATERIAL	STANDARD (see chapter 15)
Raised Temperature Polyethylene (PE-RT)	ASTM F2623

(Portions of table not shown remain unchanged)

2. Add new text as follows:

1203.17 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall conform to Sections 1203.17.1 and 1203.17.2. Mechanical joints shall conform to Section 1203.3.

1203.17.1 Compression-type fittings. Where compression type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1203.17.2 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.

Add standard to Chapter 15 as follows:

ASTM

F 2623-07 Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing[1]

PART II – IRC-M

1. Revise as follows:

TABLE M2101.1
HYDRONIC PIPING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Raised Temperature Polyethylene (PE-RT)	1, 2, 3	ASTM F2623	Copper crimp/insert fitting stainless steel clamp, insert fittings	---

(Portions of table and footnotes not shown remain unchanged)

2. Add new text as follows:

M2104.3 Raised temperature polyethylene (PE-RT) plastic tubing. Joints between raised temperature polyethylene tubing and fittings shall conform to Sections M2104.3.1 and M2104.3.2. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

M2104.3.1 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.

M2104.3.2 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.

3. Add standard to Chapter 43 as follows:

ASTM
F 2623-07 Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing[1]

Reason: This change will add a product which is suitable for the application and has an approved ASTM standard.

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

Analysis: A review of the standard proposed for inclusion in the code, ASTM F2623-07, 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 January 15, 2008.

PART I – IMC

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

PART II – IRC-M

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

M104–07/08

Table 1202.4, 1203.17 (New), 1203.17.1 (New), 1203.17.2 (New), Chapter 15 (New); IRC Table M2101.1, M2104.3 (New), M2104.3.1 (New), M2104.3.2 (New), Chapter 43 (New)

Proponent: Larry Gill, IPEX USA LLC

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

TABLE 1202.4 (Supp)
HYDRONIC PIPE

MATERIAL	STANDARD (see chapter 15)
Polyethylene/Aluminum/Polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; CSA B137.9

(Portions of table not shown do not change)

2. Add new text as follows:

1203.17 Polyethylene/Aluminum/Polyethylene (PE-AL-PE) pressure pipe. Joints between Polyethylene/Aluminum/Polyethylene pressure pipe and fittings shall conform to sections 1203.17.1 and 1203.17.2. Mechanical joints shall comply with Section 1203.3.

1203.17.1 Compression-type fittings. Where compression type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1203.17.2 PE-AL-PE 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-AL-PE pipe.

Add standards to Chapter 15 as follows:

ASTM

F 1282-06 Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe

CSA

B137.9-M91 Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems

PART II – IRC-M

1. Revise as follows:

TABLE M2101.1
HYDRONIC PIPING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Polyethylene/Aluminum/Polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F1282; CSA B137.9	Mechanical, crimp/insert	---

(Portions of table and footnotes not shown remain unchanged)

2. Add new text as follows:

M2104.3 Polyethylene/Aluminum/Polyethylene (PE-AL-PE) pressure pipe. Joints between Polyethylene/Aluminum/Polyethylene pressure pipe and fittings shall conform to M2104.3.1 and M2104.3.2. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

M2104.3.1 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.

M2104.3.2 PE-AL-PE 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-AL-PE pipe.

3. Add standards to Chapter 43 as follows:

ASTM

F 1282-06 Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe

CSA

B137.9-M91 Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems

Reason: This change will add a product which is suitable for the application and has approved ASTM and CSA standards.

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

Analysis: A review of the standards proposed for inclusion in the code, ASTM F1282-06 and CSA B137.9-M91, 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 January 15, 2008.

PART I – IMC

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

PART II – IRC-M

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

M105–07/08
1203.17 (New), 1203.17.1 (New), 1203.17.2 (New)

Proponent: Larry Gill, IPEX USA LLC

Add new text as follows:

1203.17 Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe. Joints between cross-linked polyethylene/aluminum/cross-linked polyethylene pressure pipe and fittings shall conform to sections 1203.17.1 and 1203.17.2. Mechanical joints shall comply with Section 1203.3.

1203.17.1 Compression-type fittings. Where compression type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1203.17.2 PEX-AL-PEX 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-AL-PEX pipe.

Reason: This change will add specific guidelines for the installation of a PEX-AL-PEX product which is already listed in Table 1202.4.

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

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

M106–07/08
Chapter 15

Proponent: Standards Writing Organization

Revise standards as follows:

ASME American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Standard reference number	Title
B16.5—2003 ~~1996~~	Pipe Flanges and Flanged Fittings NPS ½ through NPS 24—~~With B16.5a-1998 Addenda~~
CSD-1— 2004 ~~2002~~	Controls and Safety Devices for Automatically Fired Boilers

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title
A 106/A 106M-06a ~~04b~~	Specification for Seamless Carbon Steel Pipe for High-Temperature Service
A 420/A 420M-07 ~~05~~	Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-Temperature Service
D 1693-07 ~~05~~	Test Method for Environmental Stress-Cracking of Ethylene Plastics
D 2837—04e01	Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
D 2996— 01(2007)e01	Specification for Filament-wound Fiberglass (Glass Fiber Reinforced Thermosetting Resin) Pipe
D 3035—06 ~~03a~~	Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
D 3350—06 ~~02a~~	Specification for Polyethylene Plastics Pipe and Fittings Materials
F 1055—98(2006)~~e01~~	Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and ~~Tubing~~ Fittings
F 1476-(2006)~~01~~	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications

IIAR

International Institute of Ammonia Refrigeration
1110 N. Glebe Road, Suite 250
Arlington, VA 22201

Standard reference number	Title
2—99 (with Addendum A-2005	Addendum A to Equipment, Design, and Installation of Ammonia Mechanical Refrigerating Systems

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269-9101

Standard reference number	Title
31—06 ~~01~~	Installation of Oil-burning Equipment
37—06 ~~02~~	Stationary Combustion Engines and Gas Turbines
91— 04 ~~99~~	Exhaust Systems for Air Conveying of Vapors, Gases, ~~Mists~~ and Noncombustible Particulate Solids
262—07 ~~02~~	Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-handling Spaces
853— 07 ~~03~~	Installation of Stationary Fuel Power Plants

SMACNA

Sheet Metal and Air Conditioning Contractors National Association, Inc.
4021 Lafayette Center Drive
Chantilly, VA 20151-1209

Standard reference number	Title
SMACNA/ANSI (2005) ~~95~~	HVAC Duct Construction Standards-Metal and Flexible (2005)

UL	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062

Standard reference number	Title
174-04	Household Electric Storage Tank Water Heaters—with Revisions through ~~November 2005~~ May 2006
181A-2005	Closure Systems for Use with Rigid Air Ducts and Air Connectors
268A-98	Smoke Detectors for Duct Application—with Revisions through April ~~2003~~ 2006
343—97	Pumps for Oil-Burning Appliances—with Revisions through May ~~2002~~ 2006
391—2006 ~~95~~	Solid-fuel and Combination-fuel Central and Supplementary Furnaces~~—with Revisions through May 1999~~
412-2004	Refrigeration Unit Coolers with Revisions through February 2007
471-~~1995~~ 2006	Commercial Refrigerators and Freezers—with Revisions through ~~February~~ March 2006
508—99	**Industrial Control Equipment with Revisions through July 2005**
710— 95	Exhaust Hoods for Commercial Cooking Equipment—with Revisions through ~~April 1999~~ February 2007
726-95	Oil-Fired Boiler Assemblies —with Revisions through ~~February~~ March 2006
727—2006 ~~98~~	Oil-fired Central Furnaces~~—with Revisions through January 1999~~
791—2006 ~~93~~	Residential Incinerators~~—with Revisions through May 1998~~
834-04	Heating, Water Supply, and Power Boilers-Electric-with Revisions through March 2006
858—05	Household Electric Ranges-with Revisions through April 2006
875—04	Electric Day Bath Heaters-with Revisions through March 2006
959—01	Medium Heat Appliance Factory-built Chimneys-with Revisions through September 2006
1453—04	Electri~~c~~onic Booster and Commercial Storage Tank Water Heaters – with Revisions through May 2006
1482—96 ~~98~~	Solid-fuel Type Room Heaters—with Revisions through ~~January 2000~~ November 2006
2158-1997	~~For~~ Electric Clothes Dryers – with Revisions through May 2004
2221—01	Tests of Fire Resistive Grease Duct Enclosure ~~Systems~~ Assemblies

Reason: The *ICC Code Development Process for the International Codes* (Procedures) Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In May 2005, a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IRC Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

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

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