INTERNATIONAL RESIDENTIAL CODE – MECHANICAL

RM4-09/10
M1406.1, M1406.5, Chapter 44 (New)

Proposed Change as Submitted

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1406.1 General. Electric radiant heating systems shall be installed in accordance with the manufacturer's installation instructions and Chapters 34 through 43 of this code and shall be listed for the application. Electric radiant heating panels and heating panel sets shall comply with UL 1693. Electric space heating cables shall comply with UL 1673.

2. Delete without substitution:

~~**M1406.5 Gypsum panels.** Where radiant heating systems are used on gypsum assemblies, operating temperatures shall not exceed 125°F (52°C).~~

3. Add new standards to Chapter 44 as follows:

UL

1673-96	Electric Space Heating Cables – with revisions through July 2003
1693-02	Electric Radiant Heating Panels and Heating Panel Sets

Reason: UL 1673 and UL 1693 include a comprehensive set of construction and performance requirements that are used to evaluate and list electric space heating cables and electric radiant heating panels. Over 20 companies currently have heating cables and radiant heating panels listed. UL 1673 and UL 1693 do not require a temperature rating to be marked on the surface of the product or in the instructions. Instead, the product is specifically evaluated to the application and surfaces to which it is to be in contact. The instructions detail the surface (e.g. in concrete, on gypsum, above subfloor covered in tile, etc.). Note also that different surfaces have different temperature allowances in accordance with the standard, so all of these applications would all need to be itemized if temperatures limits are to continue to be maintained.

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

ICCFILENAME: EUGENE-RM-5-M1406.1-CH 44

Public Hearing Results

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

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

Committee Action: **Disapproved**

Committee Reason: The proposed standards do not comply with ICC Council policy # 28.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

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

Modify the proposal as follows:

M1406.1 General. Electric radiant heating systems shall be installed in accordance with the manufacturer's installation instructions and Chapters 34 through 43 of this code and shall be listed for the application. ~~Electric radiant heating panels and heating panel sets shall comply with UL 1693. Electric space heating cables shall comply with UL1673.~~

UL

~~1673-96 Electric Space Heating Cables – with revisions through July 2003~~
~~1693-02 Electric Radiant Heating Panels and Heating Panel Sets~~

Commenter's Reason: In the opinion of ICC staff, the standards did not comply with ICC standards criteria, Section (3.6.3.2). Reference to the standards is deleted, but the proposed requirement for listing is maintained.

Final Action: AS AM AMPC____ D

RM10-09/10
M1501.1, M1506, M1506.2 (New), M1507.2

Proposed Change as Submitted

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

1. Revise as follows:

M1501.1 Outdoor discharge. The air removed by every mechanical exhaust system shall be discharged to the outdoors in accordance with Section M1506.2. ~~Air shall not be exhausted into an attic, soffit, ridge vent or crawl space~~.

Exception: Whole-house ventilation-type attic fans that discharge into the attic space of dwelling units having private attics shall be permitted.

SECTION M1506
EXHAUST DUCTS AND EXHAUST OPENINGS

2. Add new text as follows:

M1506.2 Exhaust openings. Air exhaust openings shall terminate not less than 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable and non-operable openings into the building and 10 (3048 mm) feet from mechanical air intakes except where the opening is located 3 feet (914 mm) above the air intake. Openings shall comply with Sections R303.4.2 and R303.5.

3. Revise as follows:

M1507.2 Recirculation of air. Exhaust air from bathrooms and toilet rooms shall not be re-circulated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. ~~Exhaust air from bathrooms and toilet rooms shall not discharge into an attic, crawl space or other areas inside the building.~~

Reason: The logic in this proposal is consistent with the approval of M-22 last cycle which concluded that ventilation openings belong in the ventilation chapter and exhaust openings belong in the exhaust chapter. This handles all exhaust that would be encountered in residences and includes nothing new.

The stricken text in M1501.1 and M1507.2 is redundant and not needed as it will be covered under M1506.2.

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

ICCFILENAME: MCMANN-RB-2-R303.4.2-M1501-M1506

Public Hearing Results

Committee Action: **Approved as Submitted**

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

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Richard Grace of Fairfax County representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

M1501.1 Outdoor discharge. The air removed by every mechanical exhaust system shall be discharged to the outdoors in accordance with Section M1506.2. Air shall not be exhausted into an attic, soffit, ridge vent or crawl space.

Exception: Whole-house ventilation-type attic fans that discharge into the attic space of dwelling units having private attics shall be permitted.

SECTION M1506

EXHAUST DUCTS AND EXHAUST OPENINGS

M1506.2 Exhaust openings. Air exhaust openings shall terminate not less than 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable and non-operable openings into the building and 10 (3048 mm) feet from mechanical air intakes except where the opening is located 3 feet (914 mm) above the air intake. Openings shall comply with Sections R303.4.2 and R303.5.

M1507.2 Recirculation of air. Exhaust air from bathrooms and toilet rooms shall not be re-circulated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. Exhaust air from bathrooms and toilet rooms shall not discharge into an attic, crawl space or other areas inside the building.

Commenter's Reason: The proponent of this change had stricken this language stating that this was covered in the new section M1506.2, however there in no language in M1506.2 that prohibits the installation of exhaust air into an attic, crawl space or other areas inside the building. This change simply reinstates important enforceable language.

Final Action: AS AM AMPC____ D

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: RM12-09/10 is redundant with RM11-09/10 and is therefore unnecessary. RM11-09/10 already changes the length to 35 feet.

Assembly Action: **Approved as Submitted**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. Note that the assembly action, Approved as Submitted, will be the initial motion on the floor for consideration when this item is called.

Final Action: AS AM AMPC____ D

RM17-09/10

R202 (New), R303.1, R303.3, M1507.1, M1507.3 (New), M1507.3.1 (New), M1507.3.2 (New), M1507.3.3 (New), Table M1507.3.3(1) (New), Table M1507.3.3(2) (New), M1507.4, Table M1507.4

Proposed Change as Submitted

Proponent: Mike Moore, Newport Ventures, Inc., representing Broan NuTone

1. Add new definitions as follows:

LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a dwelling

WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air for the purpose of diluting and removing indoor air contaminants within a dwelling. The system is designed to provide ventilation air continuously or through a programmed intermittent schedule to satisfy the ventilation rates required for the whole house. Local exhaust or supply fans can serve as such a system.

2. Revise as follows:

R303.1 Habitable rooms. All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, doors, louvers or other *approved* openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

Exceptions:

1. The glazed areas need not be openable where the opening is not required by Section R310 and ~~an *approved* mechanical *ventilation* system capable of producing 0.35 air change per hour in the room is installed or~~ a whole-house mechanical *ventilation* system is installed ~~capable of supplying outdoor *ventilation* air of 15 cubic feet per minute (cfm) (78 L/s) per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom~~ in accordance with Section M1507.
2. The glazed areas need not be installed in rooms where Exception 1 above is satisfied and artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
3. Use of sunroom *additions* and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

R303.3 Bathrooms. Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m2), one-half of which must be openable.

Exception: The glazed areas shall not be required where artificial light and a ~~mechanical ventilation~~ local exhaust system are provided. The minimum local exhaust ~~ventilation~~ rates shall be determined in accordance with Section M1507.4. ~~50 cubic feet per minute (24 L/s) for intermittent ventilation or 20 cubic feet per minute (10 L/s) for continuous ventilation~~. ~~Ventilation~~ Exhaust air from the space shall be exhausted directly to the ~~outside~~ outdoors.

M1507.1 General. Where local exhaust or whole-house mechanical ventilation is provided ~~toilet rooms, and bathrooms are mechanically ventilated,~~ the ~~ventilation~~ equipment shall be designed in accordance with this section.

3. Add new text and tables as follows:

M1507.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

M1507.3.1 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans or a combination of such and associated ducts and controls. Where local supply or exhaust fans are used as part of such a system, they shall be tested and rated in accordance with HVI 916, and the fans' rated flow at 0.25 in w.c. static pressure shall equal or exceed the required ventilation rate determined by Section M1507.3.3. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

M1507.3.2 System Controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

M1507.3.3 Mechanical ventilation rate. The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate not less than that determined in accordance with Table M1507.3.3(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25% of each 4 hour segment and the ventilation rate prescribed in Table M1507.3.3(1) is multiplied by the factor determined in accordance with Table M1507.3.3(2).

TABLE M1507.3.3(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

Dwelling Unit Floor Area (square feet)	Number of Bedrooms				
	0-1	2-3	4-5	6-7	>7
	Airflow in CFM				
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

TABLE M1507.3.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

Run-Time Percentage In Each 4 Hour Segment	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.
b. Extrapolation beyond the table is prohibited.

4 Revise as follows:

M1507.43 Local exhaust rates ~~Ventilation rate~~. Local exhaust ~~Ventilation~~ systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.4~~3~~.

TABLE M1507.43
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE ~~VENTILATED~~ EXHAUSTED	~~VENTILATION~~ EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms—Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.4719 L/s.

Reason: This proposal is intended to provide clear guidance to builders and code officials on the design and specification of mechanical ventilation systems for homes IF such systems are installed. Instead of mandating mechanical ventilation, it provides much needed guidance on both whole-house mechanical ventilation systems and local exhaust, including definitions of the same. The language proposed serves to streamline the code by placing all requirements for mechanical ventilation systems within the current M1507, which is aptly titled "Mechanical Ventilation".

Language that is proposed for M1507 is basically a distilled version of ASHRAE 62.2. The proposed language is intended to take ASHRAE's ten page standard and reduce it to the nuts and bolts of mechanical ventilation that are simple and straightforward. ASHRAE has issued a copyright release for the table of whole-house ventilation rates. Not only are these the same rates in ASHRAE 62.2, but they are also the same rates that are now referenced in the state building codes of California and Maine as well as being referenced within the National Green Building Standard.

Similarly, the intermittent multipliers are sourced from ASHRAE 62.2 and are included to provide builders with more options for delivering equivalent ventilation.

Cost Impact: Because this language does not require whole house mechanical ventilation or local exhaust, it will not in itself increase the cost of construction.

ICCFILENAME: MOORE-RB-1-R202-R303-M1507

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a dwelling

WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air ~~for the purpose of diluting and removing indoor air contaminants within a dwelling.~~ when operating ~~The system is designed to provide ventilation air~~ continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate~~s required for the whole house. Local exhaust or supply fans can serve as such a system~~.

R303.1 Habitable rooms. All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, doors, louvers or other *approved* openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

Exceptions:

1. The glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical *ventilation* system is installed in accordance with Section M1507.
2. The glazed areas need not be installed in rooms where Exception 1 above is satisfied and artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
3. Use of sunroom *additions* and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

R303.3 Bathrooms. Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m2), one-half of which must be openable.

Exception: The glazed areas shall not be required where artificial light and a local exhaust system are provided. The minimum local exhaust rates shall be determined in accordance with Section M1507.4 Exhaust air from the space shall be exhausted directly to the outdoors.

M1507.1 General. Where local exhaust or whole-house mechanical ventilation is provided, the equipment shall be designed in accordance with this section.

M1507.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

M1507.3.1 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans or a combination of such and associated ducts and controls. ~~Where local supply or exhaust fans are used as part of such a system, they shall be tested and rated in accordance with HVI 916, and the fans' rated flow at 0.25 in w.c. static pressure shall equal or exceed the required ventilation rate determined by Section M1507.3.3~~. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

M1507.3.2 System Controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

M1507.3.3 Mechanical ventilation rate. The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate not less than that determined in accordance with Table M1507.3.3(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25% of each 4 hour segment and the ventilation rate prescribed in Table M1507.3.3(1) is multiplied by the factor determined in accordance with Table M1507.3.3(2).

TABLE M1507.3.3(1)

CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

Dwelling Unit Floor Area (square feet)	Number of Bedrooms				
	0-1	2-3	4-5	6-7	>7
	Airflow in CFM				
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1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

TABLE M1507.3.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

Run-Time Percentage In Each 4 Hour Segment	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.
b. Extrapolation beyond the table is prohibited.

4 Revise as follows:

M1507.4 Local exhaust rates. Local exhaust systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.4.

TABLE M1507.4
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms—Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.4719 L/s.

Committee Reason: The current ventilation rate of 0.35 ACH is overkill and the proposed text provides more realistic rates and options. The proposal is consistent with the IECC.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Craig Conner, Building Quality, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

M1507.1 General. ~~Where local exhaust or~~ a whole-house mechanical ventilation system ~~is~~ shall be provided and ~~the equipment~~ shall be designed in accordance with this section.

Exception: This shall not apply to a dwelling that has been tested in accordance with Section 402.4.1.2 of the IECC and such testing demonstrates that the air leakage rate is greater than five ACH 50.

Commenter's Reason: RM17 adds ventilation requirements that will be important in new energy-efficient homes. The new IECC requires residences be more airtight to save energy (presuming the approved EC13 stands). In order to maintain healthy indoor air, airtight residences will require mechanical ventilation. The IECC sets the threshold for airtightness, based on which mechanical ventilation is required, or not required.

The new IECC also allows testing of only an approved sample of residences for air tightness, rather than testing all residences. With sampling only a minority of an individual builders residences may be tested. For the tested residences, the mechanical ventilation requirement will be based on that residence's tested airtightness. As approved RM17 is unclear how the ventilation requirements apply to residences that are not tested. For example in a sample of homes, if some tested homes require ventilation and other tested homes do not, do the untested homes require ventilation? For untested residences the code should error on the side of caution by requiring mechanical ventilation. Only residences tested and shown not to require ventilation should be exempt from the health-related ventilation.

Final Action: AS AM AMPC____ D

RM19-09/10
R303.4.1

Proposed Change as Submitted

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

Revise as follows:

R303.4.1 Intake openings. Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, 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) of an intake opening, such opening shall be located a minimum of ~~2~~ 3 feet (~~610~~ 914 mm) below the contaminant source.

For the purpose of this section, the exhaust from *dwelling* unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

Reason: This dimension is inconsistent with many other code books such as IMC-401.4 #3; IRC-G2427.6.6 and G2427.8 #1; IFGC-503.6.7; IFGC-618.5 and IFGC-503.8 #1. This 3-foot dimension has been around for years and was also found in the legacy codes. It's important that sources of contamination don't make its way into building openings and there have still been issues where 2 feet doesn't work. This dimension was also changed last cycle in M22. Also, proposals have been submitted to the plumbing to complete the transition.

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

ICCFILENAME: MCMANN-RB-1-R303.4.1

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: No justification was provided demonstrating that the 2 foot dimension is improper. Consistency with the IMC is not sufficient justification.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

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

Commenter's Reason: The committee approved RM-10 which states that exhaust openings (a contaminant source) are required to be 3 feet above intake openings which is consistent with 8 other code sections. It's vital that this section be revised to fall within the balance of codes from a consistency standpoint.

Final Action: AS AM AMPC____ D

RM20-09/10
M1601.1, M1601.1.1

Proposed Change as Submitted

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

M1601.1 Duct design. Duct systems serving heating, cooling and ventilation equipment shall be ~~fabricated~~ installed in accordance with the provisions of this section and ACCA Manual D or other approved methods

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).
2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1)
3. Fibrous duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Metallic ducts shall be fabricated in accordance with *SMACNA Duct Construction Standards Metal and Flexible*. Galvanized steel shall conform to ASTM A 653.
5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. *Duct systems* shall be constructed of materials having a flame spread index not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   - 7.1. These cavities or spaces shall not be used as a plenum for supply air.
   - 7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   - 7.3. Stud wall cavities shall not convey air from more than one floor level.
   - 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight fitting fire blocking in accordance with Section R602.8.

Reason: Ducts are not fabricated according to Manual D, they are installed according to that standard. Ducts in general are fabricated according to the SMACNA Standard. This is a simple clarification.

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

ICCFILENAME: DARDANO-RM-1-M1601.1

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposed standard may not apply to residential construction.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

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

Commenter's Reason: The committee reason for disapproval was that the SMACNA Standard *may* not apply to residential construction. The Standard most definitely does apply. The IRC states that residential heating systems must conform to ACCA Manual D. Manual D states that duct construction shall be according to the SMACNA Standard.

Final Action: AS AM AMPC____ D

RM21-09/10
M1601.1.1

Proposed Change as Submitted

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).
2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1)
3. Fibrous duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Galvanized steel shall conform to ASTM A 653.
5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. ~~*Duct systems* shall be constructed of materials having a flame spread index not greater than 200.~~
7. ~~7~~6. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   - ~~7.1~~. 6.1. These cavities or spaces shall not be used as a plenum for supply air.
   - ~~7.2~~. 6.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   - ~~7.3~~. 6.3. Stud wall cavities shall not convey air from more than one floor level.
   - ~~7.4~~. 6.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight fitting fire blocking in accordance with Section R602.8.

Reason: # 6 is broken. It doesn't say or qualify what kind of duct system it's referring to. This is a great example of poor code language that's not enforceable or able to be explained with any certainty. What makes this stand out is that it does not have to meet a 25 flame-spread rating as # 2 requires?

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

ICCFILENAME: DARDANO-RM-4-M1601.1.1

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposed revision would eliminate a product line that has no apparent problems.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

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

Commenter's Reason: Item 6 conflicts with Item 2. Duct systems include factory made air ducts which are required to have a maximum flame spread of 25. Item 6 turns around and says never mind, it can be 200 if its part of a "duct system" meaning a factory made air-duct with a higher flame spread could be utilized. Item 6 is intended to address above ground plastic systems but doesn't come out and say it resulting in an interpretation problem for code officials because no one knows what kind of duct system is being referred to here. This needs to be deleted until a proposal comes forward using the word "plastic" in front of "duct systems" and see if the committee will approve it. Words mean things and the lack of words have consequences. The committee's reason for disapproval was deleting # 6 would delete a product line but there is no product line stated in the text.

Final Action: AS AM AMPC____ D

RM23-09/10
1601.4.1

Proposed Change as Submitted

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete and substitute as follows:

~~**M1601.4.1 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 UL 181A and shall be marked "181A-P" for pressure-sensitive tape, "181 A-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 1½ 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 manufacturers' 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.~~
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.~~

M1601.4.1 Joints, seams and connections. All longitudal 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 or tapes. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181 B-FX" for pressure sensitive tape or "181 B-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 manufacturers' instructions. Round metallic ducts shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint. Unlisted duct tape shall not be permitted as a sealant on any duct.

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: This text is being replaced with that of the IMC. The IMC language is more concise and complete. The language covering contact lap is deliberately deleted as it is inconsistent with the SMACNA Standard which calls for a one inch lap. Also language covering unlisted tape is not present in the IRC text. This is strictly editorial in nature with no new content.

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

ICCFILENAME: DARDANO-RM-2-M1601.4.1

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee did not have the opportunity to review the proposed new standards. It is not clear what standard is being referenced.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

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

Modify the proposal as follows:

M1601.4.1 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 or tapes. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181 B-FX" for pressure sensitive tape or "181 B-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. Crimp joints for round metallic ducts shall have a contact lap of at least 1 inch (25 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 manufacturers' instructions. Round metallic ducts shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint. Unlisted duct tape shall not be permitted as a sealant on any duct.

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.

Commenter's Reason: The committee reason for disapproval was that they didn't have the opportunity to review the standard. This standard has been part of the code for years. Dwellings constructed under the IMC must adhere to the SMACNA Standard. Dwellings under the IRC should be held to the same standard for consistency sake and uniform enforcement of the code. There is no cost increase in utilizing the standard. The code tells us that residential systems must be installed according to ACCA Manual D and that document states that duct construction should be in accordance with the SMACNA Standard. The Tables in the IRC for duct construction are the same gages found in the standard. There is no technical reason to construct a duct system differently between the two codes. The committee mentioned that they would like to see the reference to joint lapping reinstated. It was done so with the dimension found in the standard.

Final Action: AS AM AMPC____ D

RM32-09/10
M1901.3 (New)

Proposed Change as Submitted

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Add new text as follows:

M1901.3 Prohibited location. Cooking appliances designed, tested, listed and labeled for use in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur.

Reason: Commercial cooking appliances are prohibited by the IMC (Sections 917.2 and 917.3) in dwelling units due to the difference in temperature requirements and operations between commercial and household appliances. This prohibition should also be in the IRC for consistency.

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

Analysis: Sections G2447.2 and G2447.3 address the issue for gas-fired cooking appliances.

ICCFILENAME: EUGENE-RM-18-1901.3

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposed text is already covered in Chapter 24 and the proposed text in RM31-09/10.

Assembly Action: **Approved as Submitted**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action and a public comment. Note that the assembly action, Approved as Submitted, will be the initial motion on the floor for consideration when this item is called.

Public Comment:

Miriam McGiver representing New York State Department of State Division of Code Enforcement and Administration, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

M1901.3 Prohibited location. Cooking appliances designed, tested, listed and labeled for use only in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur.

Commenter's Reason: The proposal as written would not allow use of a cooking appliance that is listed for use both in a household and a commercial occupancy. This public comment change will allow cooking appliances that are dual listed, for residential and commercial use, to be used in residential settings.

RM31, if approved, requires that cooking appliances in dwellings shall be listed for household use.

Final Action: AS AM AMPC____ D

RM33-09/10
M1902.2, Chapter 44 (New)

Proposed Change as Submitted

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1902.2 Installation. Sauna heaters shall be installed in accordance with the manufacturer's installation instructions. Sauna heaters shall comply with UL 875.

2. Add new standard to Chapter 44 as follows:

UL
875-09 Electric Dry-Bath Heaters

Reason: UL 875 is already referenced in Section 914.2 of the International Mechanical Code, and includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list sauna heaters. Four companies currently have listings for sauna heaters.

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

Public Hearing Results

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

Analysis: The proposed new standard is currently referenced in the IMC and was not reviewed by staff

Committee Action: **Approved as Submitted**

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

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Miriam McGiver representing New York State Department of State Division of Code Enforcement and Administration, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

M1902.2 Installation. Sauna heaters shall be installed in accordance with the manufacturer's installation instructions. Electric sauna heaters shall comply with UL 875.

Commenter's Reason: This modification is proposed to add clarity. The UL standard 875 is applies only to electric heaters. As the current proposal is written, it appears the standard would apply to sauna heaters that are not electric. This public comment change is intended to limit the requirement to comply with UL 875, Electric Dry-Bath Heaters, to sauna heaters that are electric.

Final Action: AS AM AMPC____ D

RM38-09/10

M2301, M2301.1, M2302 (New), M2302.1 (New), M2302.2 (New), M2302.2.1 (New), M2302.2.2 (New), M2302.2.3 (New), M2302.2.4 (New), M2302.3 (New), M2302.4 (New), Chapter 44

Proposed Change as Submitted

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

SECTION M2301
THERMAL SOLAR ENERGY SYSTEMS

M2301.1 General. This section provides for the design, construction, installation, alteration and repair of equipment and systems using thermal solar energy to provide space heating or cooling, hot water heating and swimming pool heating.

2. Add new text as follows:

SECTION M2302
PHOTOVOLTAIC SOLAR ENERGY SYSTEMS

M2302.1 General. This section provides for the design, construction, installation, alteration and repair of photovoltaic equipment and systems.

M2302.2 Installation. The installation of photovoltaic systems shall comply with the manufacturer's installation instructions, Sections M2302.2.1 through M2302.2.4 and NFPA 70.

M2302.2.1 Access. Photovoltaic panels, modules, inverters, converters, and combiner boxes shall be accessible for inspection, maintenance, repair and replacement.

M2302.2.2 Roof-mounted panels and modules. Where photovoltaic panels and modules are installed on roofs, the roof shall be constructed to support the loads imposed by such modules. Roof-mounted photovoltaic panels and modules that serve as a roof covering shall conform to the requirements for roof coverings in Chapter 9. Where mounted on or above the roof coverings, the photovoltaic panels and modules and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

M2302.2.3 Roof and wall penetrations. Roof and wall penetrations shall be flashed and sealed in accordance with Chapter 9 to prevent entry of water, rodents and insects.

M2302.2.4 Ground-mounted panels and modules. Ground-mounted panels and modules shall be installed in accordance with the manufacturer's installation instructions.

M2302.3 Photovoltaic panels and modules. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703

M2302.4 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

3. Add new standards to Chapter 44 as follows:

UL

1703-02	Flat-Plate Photovoltaic Modules and Panels – with revisions through April 2008
1741-99	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources – with revisions through November 2005

Reason: The purpose of the code change is to distinguish between two types of solar systems – thermal and photovoltaic – and provide basic safety requirements for photovoltaic systems.

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

ICCFILENAME: EUGENE-RM-19-2301-2302-CH 44

Public Hearing Results

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

Analysis: Review of the proposed new standard UL 1703-02 indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

Analysis: Review of the proposed new standard UL 1741-99 indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Section (3.6.3.2)

Committee Action: **Approved as Submitted**

Committee Reason: The proposal adds coverage for PV solar systems and provides the needed standards.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Joann Surma representing he Dow Chemical Company, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

SECTION M2301
THERMAL SOLAR ENERGY SYSTEMS

M2301.1 General. This section provides for the design, construction, installation, alteration and repair of equipment and systems using thermal solar energy to provide space heating or cooling, hot water heating and swimming pool heating.

SECTION M2302
PHOTOVOLTAIC SOLAR ENERGY SYSTEMS

M2302.1 General. This section provides for the design, construction, installation, alteration and repair of photovoltaic equipment and systems.

M2302.2 ~~Installation~~ Requirements. The installation, inspection, maintenance, repair and replacement of photovoltaic systems and all system components shall comply with the manufacturer's ~~installation~~ instructions, Sections M2302.2.1 through M2302.2.~~4~~ 3 and NFPA 70.

~~**M2302.2.1 Access.** Photovoltaic panels, modules, inverters, converters, and combiner boxes shall be accessible for inspection, maintenance, repair and replacement.~~

M2302.2.~~2~~ 1 Roof-mounted panels and modules. Where photovoltaic panels and modules are installed on roofs, the roof shall be constructed to support the loads imposed by such modules. Roof-mounted photovoltaic panels and modules that serve as a roof covering shall conform to the requirements for roof coverings in Chapter 9. Where mounted on or above the roof coverings, the photovoltaic panels and modules and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

M2302.2.~~3~~ 2 Roof and wall penetrations. Roof and wall penetrations shall be flashed and sealed in accordance with Chapter 9 to prevent entry of water, rodents and insects.

M2302.2.~~4~~ 3 Ground-mounted panels and modules. Ground-mounted panels and modules shall be installed in accordance with the manufacturer's installation instructions.

M2302.3 Photovoltaic panels and modules. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703

M2302.4 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

3. Add new standards to Chapter 44 as follows:
UL 1703-02 Flat-Plate Photovoltaic Modules and Panels – with revisions through April 2008 UL 1741-99 Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed

Energy Resources – with revisions through November 2005

Commenter's Reason: This code change helps to distinguish between two types of solar systems – thermal and photovoltaic. It provides for needed direction on the use of photovoltaic systems.

This public comment further clarifies the requirements for these systems by creating a specific section; **M2302.2 Requirements** and including all important parameters in that section. The issues of installation, inspection, maintenance, repair, replacement, and accessibility have all been combined in this one section. The text referencing the other remaining subsections and NFPA 70 remains intact. This new language eliminates conflicts between NFPA 70 requirements and the original proposal wording. Also, rather than calling out specific individual pieces of the photovoltaic system (i.e. panels, modules, inverters, converters, and combiner boxes) the entire photovoltaic system and system components are referenced. This will provide more inclusive language, such that no elements are missed.

Final Action: AS AM AMPC____ D