IRC — Mechanical

2018 GROUP A PUBLIC COMMENT AGENDA

OCTOBER 24 - 31, 2018
GREATER RICHMOND CONVENTION CENTER
RICHMOND, VA

ICC
INTERNATIONAL CODE COUNCIL®

2018 Public Comment Agenda

First Printing

Publication Date: August 2018

PRINTED IN THE USA

RM3-18

IRC: M1307.7

Proposed Change as Submitted

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

2018 International Residential Code

Add new text as follows

M1307.7 Prohibited support. Gypsum board shall not be used as a support base under an appliance.

Reason: If appliances are installed resting on gypsum board, the board can compress, degrade from heat, moisture and vibration and crumble, with the result being movement and settling of the appliance which would put stress on gas piping, vent connectors, chimney connectors, electrical connections and ductwork. Gypsum board is not intended to be a support base for vertical deadloads.

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

RM3-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The support of appliances is already covered in the code. (Vote 6-3)

Assembly Action: **None**

RM3-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)requests As Submitted.

Commenter's Reason: Gypsum panel products are not intended for use as appliance supports and will not perform adequately when misused in this way.
The members of the Gypsum Association, the manufacturers of these products, note the following reasons for not using their products in this application:

> Gypsum panels do not have the compressive strength to support heavy loads over time and will eventually "crush" under the weight of the appliance. This can cause stress on fittings and connections that may lead to a life safety hazard.
> If an appliance such as a refrigerator or water heater were to leak water onto the panel, this can not only further exacerbate the issue with compressive strength mentioned above, but also lead to the growth of mold, especially in panel products not intended for high moisture conditions. The mold is an additional life safety/health concern.
> It was stated at the Committee Action Hearings that one jurisdiction places gypsum panel products under appliances because it is a thermal barrier or greater depending upon thickness and type. Indeed, for a single event fire exposure this is true. However, continual heat exposure as may occur under a furnace or water heater burner will degrade this ability over time by causing calcination (the release of chemically combined water from the gypsum matrix) – this is why gypsum panels are required to be a set distance from heat in a situation such as a grease duct. As this degradation occurs the panels will lose strength due to changes in their crystalline structure and become more likely to compress and create issues.
> Some committee members cited as their reason for disapproval the fact that the mechanical code already prohibits this. A thorough review of the IMC showed that this is not true. The use of gypsum panel products as appliance supports is not currently prohibited in the code.

For the reasons above, we strongly encourage overturning the committee and approving the code change as submitted.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal would not affect costs, as there are other alternatives to gypsum panels for this application which cost no more then gypsum panels.

RM3-18

RM5-18

IRC: M1309

Proposed Change as Submitted

Proponent: Craig Conner, representing self (craig.conner@mac.com); Jani Palmer (Palmer.Janise@epa.gov)

2018 International Residential Code

Add new text as follows

M1309 Radon testing. Radon testing shall be performed for radon zone 1, as defined in Appendix F. This section requires that tests be performed and the results be provided to the owner, but does not require a specific test result.

Exceptions:

1. Testing is not required where the authority having jurisdiction has defined the radon zone as Zone 2 or 3.
2. Testing is not required where the occupied space is located above an open space.

Testing shall be performed as specified in items 1 through 10:

1. Testing shall be performed after the dwelling passes its air tightness test.
2. Testing shall be performed after the radon control system installation is complete. If the system has an active fan, the residence shall be tested with the fan operating.
3. Testing shall be performed at the lowest floor level that will be occupied, whether or not the space is finished. Spaces that are physically separated and served by different HVAC systems shall be tested separately.
4. Testing shall not performed in a closet, hallway, stairway, laundry room, furnace room, bathroom or kitchen.
5. Testing shall be performed with a commercially available radon test kit or with a continuous radon monitor that can be calibrated. Testing with test kits shall include two tests, and the test results shall be averaged. Testing shall be in accordance with the testing device manufacturer's instructions.
6. Testing shall be performed by the builder, a registered design professional, or an approved third party.
7. Testing shall be conducted over a period of not less than 48 hours or not less that the period specified by the testing device manufacturer, whichever is longer. The initial testing shall begin prior to occupancy, but need not be completed prior to occupancy.
8. Test results shall be provided directly to the owner by the test lab or testing party and shall be delivered either before or after occupancy.
9. An additional pre-paid test kit shall be provided to the owner to utilize at the owner's discretion. The test kit shall include mailing or emailing the results from the testing lab to the owner.

10. The owner or registered design professional shall be notified in writing prior to occupancy, stating one of the following:

    10.1. A radon test result of 4 pCi/L or above is the ‘action level' set by EPA. The EPA recommends radon reduction measures to lower radon levels below 4 pCi/L.".

    10.2. For a radon test result of 4 pCi/L or above [name of builder or authority having jurisdiction] recommends radon reduction measures to lower radon levels below 4 pCi/L."

Reason: Radon tests are the only way to know if a residence has significant levels of radon. The test kits are inexpensive and easy to use. This change is designed not to delay the sale or occupancy of the home. Testing in radon zone 1 provides information for areas that tend to have higher levels of radon.

Cost Impact: The code change proposal will increase the cost of construction
Multiple companies make inexpensive radon test kits. This change would require two tests which are averaged, plus a third test kit to be left with the owners. Three tests including pre-paid testing, postage and tax will cost less that $80, often less than $50.

RM5-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The text is proposed in wrong location. Belongs in an appendix or the building part of code, not in mechanical part. This puts pressure on the contractor after the home is built. The owner may not be in the picture. There might not be a design professional involved. Items 7 and 10 conflict. There is a need to address ongoing testing requirements. (Vote 10-0)

Assembly Action: **None**

RM5-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Craig Conner, representing self (craig.conner@mac.com); Jani Palmer, representing US Environmental Protection Agency (palmer.janise@epa.gov); Gary Hodgden, representing himself (gary@aair.com); Bruce Snead representing himself (bsnead@ksu.edu)requests As Modified by This Public Comment.

Replace as follows:

2018 International Residential Code

AF103.13 **Radon testing.** Where radon-resistant construction is required for new construction, radon testing shall also be required for new construction.
Testing shall be performed as specified in items 1 through 10:

1. Testing shall be performed after the dwelling passes its air tightness test.
2. Testing shall be performed after the radon control system installation is complete. If the system has an active fan, the residence shall be tested with the fan operating.
3. Testing shall be performed at the lowest floor level that will be occupied, whether or not the space is finished. Spaces that are physically separated and served by different HVAC systems shall be tested separately.
4. Testing shall not be performed in a closet, hallway, stairway, laundry room, furnace room, bathroom or kitchen.
5. Testing shall be performed with a commercially available radon test kit or with a continuous radon monitor that can be calibrated. Testing with test kits shall include two tests, and the test results shall be averaged. Testing shall be in accordance with the testing device manufacturer's instructions.
6. Testing shall be performed by the builder, a registered design professional, or an approved third party.
7. Testing shall be conducted over a period of not less than 48 hours or not less that the period specified by the testing device manufacturer, whichever is longer.
8. Written radon test results shall be provided by the test lab or testing party. Written test results shall be included with construction documents.
9. An additional pre-paid test kit shall be provided to the owner to utilize at the owner's discretion. The test kit shall include mailing or emailing the results from the testing lab to the owner.
10. Where the radon test result is 4 pCi/L or greater, the fan for the radon vent pipe shall be installed as specified in Sections AF103.8 and AF103.12.

Exception: Testing is not required where the occupied space is located above an unenclosed open space.

Commenter's Reason: The only way to know for sure if a radon system works is to test it. The test is in effect the commissioning for a radon system. The tests are inexpensive.

This responds to several comments. Multiple people requested that that the radon test requirement be moved into the radon appendix, Appendix F. Some commented that there may not yet be an owner when the home is built, so this public comment allows test results to be provided with construction documents. The language in #7 and #10 was clarified. This deletes mention of test results delivered after occupancy, which would be after the code enforcement authority has lapsed.

More than half the states have some kind of statewide radon requirement or have local jurisdictions that have adopted radon requirements. You can look at your state's radon requirement in the LawAtlas project. (http://lawatlas.org/datasets/state-radon-laws , click "explore", click your state)

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Multiple companies make inexpensive radon test kits. This change would require two tests which are averaged, plus a third test kit to be left with the owners. Three tests including pre-paid testing, postage and tax will cost less that $80, often less than $50.

RM5-18

RM7-18

IRC: M1401.1

Proposed Change as Submitted

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

2018 International Residential Code

M1401.1 Installation. Heating and cooling *equipment* and *appliances* shall be installed in accordance with the manufacturer's instructions and the requirements of this code. HVAC systems shall be installed in compliance with ACCA 5 QI.

Reason: ACCA 5 QI details nationally-recognized minimum criteria for the proper installation of HVAC systems in new and existing residential and commercial buildings. This Standard provides a universally accepted definition for quality installation across a broad spectrum of the HVAC industry (e.g., manufacturers, distributors, contractors, user groups, customers, utilities, efficiency advocates, trade associations, professional societies, and governmental agencies). In this Standard, the QI elements focus on the application and how well the system is selected and actually installed. ACCA 5 QI is also a consensus-based ANSI standard. A proposal to add ACCA 5 QI to Chapter 44, Referenced Standards, has also been submitted.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impacts.

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

RM7-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The requirement would add cost and complexity to installations and would prohibit homeowners from performing their own work.The standard is aimed at contractors, is not enforceable and is a best practice guide. (Vote 10-0)

Assembly Action: **None**

RM7-18

Individual Consideration Agenda

Public Comment 1:

Proponent: David Bixby, Air Conditioning Contractors of America, representing Air Conditioning Contractors of America (david.bixby@acca.org)requests As Submitted.

Commenter's Reason: ACCA 5 QI is an ANSI standard which details the nationally-recognized minimum criteria for the proper design and installation of HVAC systems. It was developed with input from equipment OEM's, utilities, jurisdictions, energy efficiency advocates, and allied organizations. The requirement to comply with ACCA 5 QI would NOT prohibit homeowners from performing their own work. Homeowners who are knowledgeable in performing their own work, thereby serving in the contractor role, would benefit from following an easy to understand nationally-recognized minimum criteria. To that end, ACCA 5 QI is available to the public as a free download by going to the following link: www.acca.org/quality
Those who are currently knowledgeable in performing such work are already using the same minimum core requirements that are outlined in ACCA 5 QI. It would only add cost and complexity if installers (or homeowners) are not following industry accepted minimums. To do otherwise would be risking the safety, efficiency and performance of the installation, which could create more cost in the future as a result of poor design and installation.

For this Standard, core areas that characterize a quality installation include: **(1) Design Aspects**, such as heat gain/loss load calculations, equipment capacity selection; **(2) Distribution Aspects**, such as duct leakage, airflow balance; **(3) Equipment Installation Aspects**, such as electrical requirements, system controls, refrigerant charge, and system documentation; and **(4) Owner Education Aspects** for proper system documentation and owner/operator education.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposal would not increase cost of design and installation of HVAC systems as ACCA 5 QI contains the minimum nationally-recognized core competencies that are needed to perform a safe and efficient installation. If these minimum competencies are not followed, the cost and complexity would be adversely affected if not designed and installed properly.

RM7-18

RM9-18

IRC: M1411.3.1.2

Proposed Change as Submitted

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

2018 International Residential Code

Add new text as follows

M1411.3.1.2 Appliance, equipment and insulation in pans. Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, that portion of the appliance, equipment and insulation shall be installed above the rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant and approved.

Reason: This is editorial in nature and is missing from this code. This can be found in the IMC Section 307.2.3.2 and in the IPC. This addition will make the IRC consistant with the other codes.

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

RM9-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This is consistent with the IMC requirements. The appliances need to be protected regardless of their location in residential or commercial. (Vote 8-2)

Assembly Action: **None**

RM9-18

Individual Consideration Agenda

Public Comment 1:

Proponent: DONALD SURRENA, NATIONAL ASSOCIATION OF HOME BUILDERS, representing National Association of Home Builders (dsurrena@nahb.org)requests As Modified by This Public Comment.

Modify as follows:

2018 International Residential Code

M1411.3.1.2 Appliance, equipment and insulation in pans. Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, that portion of the appliance, equipment and insulation shall be installed above the rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant ~~and approved~~ .

Commenter's Reason: Removing and approved takes away the question of who approves as well as exactly what is approved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This modification will not change the cost of construction.

RM9-18

RM12-18

IRC: M1503.3

Proposed Change as Submitted

Proponent: Mike Moore, Newport Ventures, representing Broan-NuTone (mmoore@newportventures.net)

2018 International Residential Code

M1503.3 Exhaust discharge. Domestic cooking exhaust equipment shall discharge to the outdoors through a duct. The duct shall have a smooth interior surface, shall be air tight, shall be equipped with a backdraft damper and shall be independent of all other exhaust systems. Ducts serving domestic cooking exhaust equipment shall not terminate in an attic or crawl space or areas inside the building.
Listed and labeled ductless range hoods shall not be required to discharge to the outdoors where all of the following conditions are met:

~~**Exception:** Where installed in accordance with the manufacturer's instructions, and where mechanical or natural ventilation is otherwise provided, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.~~

1. The equipment is installed in accordance with the manufacturer's instructions.
2. Mechanical or natural ventilation is otherwise provided in the cooking area.
3. The equipment is installed in a newly constructed dwelling unit other than single family, or is installed in an existing kitchen not having an existing range hood exhaust duct to the outdoors.

Reason: Cooking is typically the largest source of indoor air pollution in homes, with concentrations of key pollutants frequently exceeding U.S. National Ambient Air Quality Standards. Over time, exposure to these pollutants has been shown to reduce length and quality of life. Clearly, kitchen ventilation is needed to comply with the purpose of the IRC to "safeguard public safety, health, and general welfare through…ventilation" (among other means). Unless captured and exhausted at the source, cooking pollutants spread rapidly through a home and deposit themselves on surfaces, only to be released again into the breathing zone when disturbed at a later time. For new construction in detached buildings, where the builder elects to install a range hood, requiring that the range hood be ducted is a very low-cost item with high returns in terms of occupant health. For reasons of constructability and cost sensitivity (not health), this proposal would only permit ductless range hoods when they are installed in an attached dwelling unit of new construction or when they are installed in an existing kitchen that doesn't have an pre-existing range hood exhaust duct.

Bibliography:

1. Wallace, L. A., Emmerich, S. J., & Howard-Reed, C. (2004). Source strengths of ultrafine and fine particles due to cooking with a gas stove. Environmental Science & Technology, 38(8), 2304-2311.
2. Singer, B. C., Apte, M. G., Black, D. R., Hotchi, T., Lucas, D., Lunden, M.,Sullivan, D. P. (2010). Natural Gas Variability in California: Environmental Impacts and Device Performance: Experimental Evaluation of Pollutant Emissions from Residential Appliances. Sacramento CA: California Energy Commission.
3. Dennekamp, M., Howarth, S., Dick, C. A. J., Cherrie, J. W., Donaldson, K., & Seaton, A. (2001). Ultrafine particles and nitrogen oxides generated by gas and electric cooking. Occupational and Environmental Medicine, 58(8), 511-516.
4. Moschandreas, D. J., & Relwani, S. M. (1989). Field-Measurements of NO2 Gas Range-Top Burner Emission Rates. Environment International, 15(1-6), 489-492.
5. Moschandreas, D., Relwani, S., Johnson, D., & Billick, I. (1986). Emission Rates from Unvented Gas Appliances. Environment International, 12(1-4), 247-254.
6. EPA. Fine Particle Designations. Available at http://www.epa.gov/pmdesignations/faq.htm. Sourced on December 10, 2014.
7. Logue et al. (2012). A method to estimate the chronic health impact of air pollutants in U.S. residences. Environmental Health Perspectives: 120(2): 216–222.
8. McKenna, M.T., C.M. Michaud, C.J.L. Murray, and J.S. Marks. (2005). Assessing the burden of disease in the United States using disability-adjusted life years. Am J Prev Med.: 28(5):415–423.
9. Nicole, W. (2014). Cooking Up Indoor Air Pollution: Emissions from Natural Gas Stoves. Environ Health Perspect: 122-A27.
10. Offerman, F.J. (2009). Ventilation and indoor air quality in new homes. PIER Collaborative Report. California Energy Commission & California Environmental Protection Agency Air Resources Board.
11. Klug, V. L., Lobscheid, A. B., & Singer, B. C. (2011). Cooking Appliance Use in California Homes – Data Collected from a Web-Based Survey LBNL-5028E. Berkeley, CA: Lawrence Berkeley National Laboratory.
12. Logue et al. (2014). Pollutant exposures from natural gas cooking burners: a simulation based assessment for Southern California." Lawrence Berkeley National Laboratory. LBNL-6712E.
13. Smith, P.A. (2013). The Kitchen as a Pollution Hazard. New York Times. http://well.blogs.nytimes.com/2013/07/22/the-kitchen-as-a-pollution-hazard/?_r=0. Accessed December 10, 2014.
14. Belanger, K., Gent, J. F., Triche, E. W., Bracken, M. B., & Leaderer, B. P. (2006). Association of indoor nitrogen dioxide exposure with respiratory symptoms in children with asthma. American Journal of Respiratory and Critical Care Medicine, 173(3), 297-303. doi: 10.1164/rccm.200408-1123OC.
15. Hansel, N. N., Breysse, P. N., McCormack, M. C., Matsui, E. C., Curtin-Brosnan, J., Williams, D. L., . . . Diette, G. B. (2008). A longitudinal study of indoor nitrogen dioxide levels and respiratory symptoms in inner-city children with asthma. Environmental Health Perspectives, 116(10), 1428-1432. doi:10.1289/ehp.11349.
16. Garrett, M. H., Hooper, M. A., Hooper, B. M., & Abramson, M. J. (1998). Respiratory symptoms in children and indoor exposure to nitrogen dioxide and gas stoves. American Journal of Respiratory and Critical Care Medicine, 158(3), 891-895.
17. Abdullahi, K. L., Delgado-Saborit, J. M., & Harrison, R. M. (2013). Emissions and indoor concentrations of particulate matter and its specific chemical components from cooking: A review. Atmospheric Environment, 71, 260-294. doi: Doi 10.1016/J.Atmosenv.2013.01.061.
18. Buonanno, G., Morawska, L., & Stabile, L. (2009). Particle emission factors during cooking activities. Atmospheric Environment, 43(20), 3235-3242. doi: Doi 10.1016/J.Atmosenv.2009.03.044.
19. Fortmann, R., Kariher, P., & Clayton, R. (2001). Indoor air quality: residential cooking exposures. Sacramento, CA: Prepared for California Air Resources Board.
20. Seaman, V. Y., Bennett, D. H., & Cahill, T. M. (2009). Indoor acrolein emission and decay rates resulting from domestic cooking events. Atmospheric Environment, 43(39), 6199-6204. doi: 10.1016/j.atmosenv.2009.08.043.
21. Zhang, Q. F., Gangupomu, R. H., Ramirez, D., & Zhu, Y. F. (2010). Measurement of Ultrafine Particles and Other Air Pollutants Emitted by Cooking Activities. International Journal of Environmental Research and Public Health, 7(4), 1744-1759. doi: 10.3390/ijerph7041744.

Cost Impact: The code change proposal will increase the cost of construction
Where builders are already installing ducts with range hoods, there will not be any increase in the cost of construction. Where new, single-family dwelling units are not currently provided with ducts for their range hoods, this proposal would increase the cost of construction. Installed duct costs can be estimated at ~ $9.85 per linear foot for 3.25"x10" galvanized sheet metal (RS Means, 2015, Section 23 31 13.13.0500), and a damper would cost about $15 retail.

RM12-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The text is item 3 is hard to interpret. This proposal discriminates against single family dwellings. (Vote 10-0)

Assembly Action: **None**

RM12-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Mike Moore, representing Broan (mmoore@newportventures.net)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Residential Code

M1503.3 Exhaust discharge. Domestic cooking exhaust equipment shall discharge to the outdoors through a duct. The duct shall have a smooth interior surface, shall be air tight, shall be equipped with a backdraft damper and shall be independent of all other exhaust systems. Ducts serving domestic cooking exhaust equipment shall not terminate in an attic or crawl space or areas inside the building.
Listed and labeled ductless range hoods shall not be required to discharge to the outdoors where all of the following conditions are met:

1. The equipment is installed in accordance with the manufacturer ' s instructions.
2. Mechanical or natural ventilation is otherwise providedin the cooking area.
3. The equipment is installed in a newly constructed dwelling unit ~~other than single-family~~that is not a detached one-family dwelling unit, or the equipment is installed in an existing kitchen not having an existing range hood exhaust duct to the outdoors.

Commenter's Reason: Per the original reason statement, exhausting kitchen pollutants at its source is one of the most significant measures that can be implemented to provide minimum acceptable indoor air quality in dwelling units. In detached single-family dwellings of new construction, a designer/builder has plenty of options for locating a kitchen exhaust fan to very simply exhaust it to the outdoors at a low first-cost.

This modification to the original proposal addresses the committee s objection regarding confusing language by clarifying the language in #3. The committee also objected to this proposal on the grounds that it unfairly discriminates against single family dwellings. From a public health perspective, the committee is correct that there is no good reason to exempt any dwelling unit from a requirement to duct kitchen exhaust equipment to the outdoors. However, requiring an exhaust duct for kitchen exhaust in all cases could be especially costly for some attached dwelling units that may have less options for cost-effectively ducting kitchen exhaust to the exterior. As such, I ve restricted requirements to provide kitchen ducts with exhaust ducts to the exterior to the following scenarios: A) installation of a kitchen exhaust appliance in a new, detached, one-family dwelling unit and B) installation of a kitchen exhaust appliance in an existing kitchen with an existing range hood exhaust duct to the outdoors.

Bibliography: See original proposal for references.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Where builders are already installing ducts with range hoods, there will not be any increase in the cost of construction.Where new, single-family dwelling units are not currently provided with ducts for their range hoods, this proposal would increase the cost of construction. Installed duct costs can be estimated at ~ $9.85 per linear foot for 3.25" x10" galvanized sheet metal (RS Means, 2015, Section 23 31 13.13.0500), and a damper would cost about $15 retail.

RM12-18

RM17-18

IRC: M1504.3

Proposed Change as Submitted

Proponent: Mike Moore, representing The Home Ventilating Institute (mmoore@newportventures.net)

2018 International Residential Code

Revise as follows

M1504.3 Exhaust openings. Air exhaust openings shall terminate as follows:

1. Not less than 3 feet (914 mm) from property lines.
2. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors.
3. Not less than 10 feet (3048 mm) from mechanical air intake openings except where either of the following apply:

   3.1. The exhaust opening is located not less than 3 feet (914 mm) above the air intake opening.
   3.2. The exhaust opening is part of a factory-built intake/exhaust combination termination fitting installed in accordance with the manufacturer's instructions, and the exhaust air is drawn from a living space.
4. Openings shall comply with Sections R303.5.2 and R303.6.

Reason: This proposal is very similar to a PMGCAC proposal on the same subject. The only difference is that this proposal does not include the word "approved" in front of "factory-built intake/exhaust termination combination fitting". In some jurisdiction, equipment or products requiring approval will trigger an "alternative means and methods" process to secure a permit. As explained in the reason statement below, these products have been determined to perform well across manufacturers and models. With good performance and insignificant deviation across products, there is no need to further scrutinize these products or delay permits for dwelling units that specify them. This is the position of the Home Ventilating Institute.

The rest of the reason statement echoes that in the PMGCAC proposal:

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

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

Note: The IRC defines living space as, “space within a *dwelling unit* utilized for living, sleeping, eating, cooking, bathing, washing and sanitation purposes”. The use of the term “environmental air” was also considered, but was abandoned because “environmental air” can also include exhaust air from parking garages and clothes dryers, which we want to exclude from this exception.

Bibliography: Bibliography:

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

Cost Impact: The code change proposal will decrease the cost of construction
This proposal can reduce the number of intake and exhaust penetrations required for a dwelling unit, thereby reducing the cost of construction.

RM17-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: There is no listing or product approval for the fitting. (Vote 8-1)

Assembly Action: **None**

RM17-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Mike Moore, representing Broan (mmoore@newportventures.net)requests As Submitted.

Commenter's Reason: Four proposals were submitted at the committee hearings to address factory-built intake/exhaust combination termination fittings for use within dwelling units -- two to the IMC (M16 and M17) and two to the IRC (RM17 and RM27). M17 and RM27 contained essentially the same language that would permit these fittings if approved (i.e., successfully navigating an alternative means and methods evaluation process). M16 and RM17 contained essentially the same language that would permit these fittings without requiring an alternative means and methods evaluation process.
In Columbus, the IMC committee approved M17 as submitted. At a minimum, to facilitate coordination across codes, RM27 should also be approved as submitted. However, it can be argued that M17 and RM27 s requirements for a special approval process for these terminations introduce unnecessary costs, especially since third-party testing of such terminations has shown excellent separation of supply and exhaust streams (see original rationale for more information), and these devices have been provided by manufacturers for installation with dwelling unit ventilation systems for about 2 decades with no known failures reported. Until failures or deficiencies of such terminations are documented, there is no compelling reason to require an alternative means and methods process for approval which would add cost and time to projects with little to no benefit to the consumer. So, we are also requesting support of PCs to approve M16 and RM17 As Submitted, which will remove any requirements for special approval of these terminations. In summary, the requested action at the final hearings is As Submitted for the following proposals: M16, M17, RM17, and RM27.

INSTALLATION I (JOIST MOUNTING-I) CONTINUED

10.Install outdoor hood and connect with insulated ducts.

(1) Panasonic recommends the use of the optional Wall Cap (Model: FV-WC04VE1) which is easy to install with one wall penetration and keeps the airstreams separate to minimize short-circuiting. (Fig.4-2~5)

For more details,please check the INSTALLATION INSTRUCTIONS of Wall Cap.

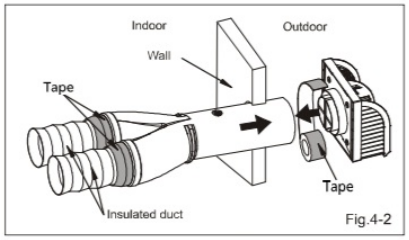


Fig.4-2

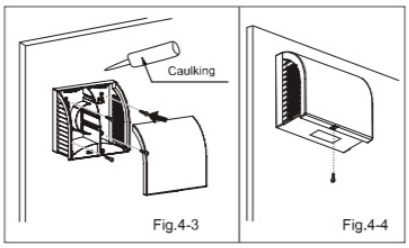


Fig.4-3 Fig.4-4

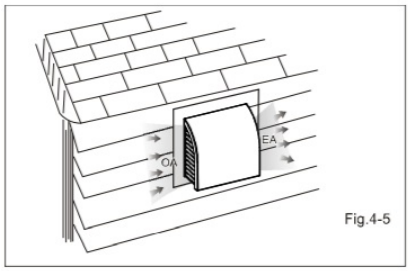
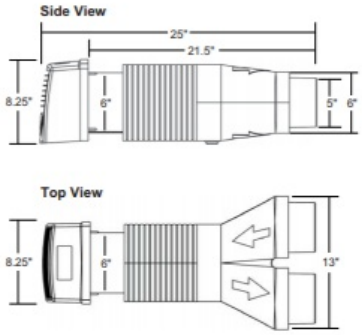
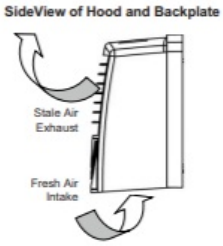


Fig.4-5

Dual Hood Part 99-190

With the Lifebreath Dual Hood, only one 6 in hole is required in the exterior wall to complete two connections: fresh air intake and stale air exhaust.



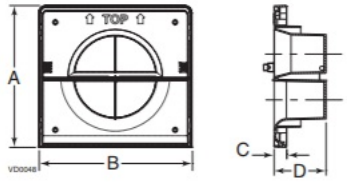


Note

- Tested by: National Research Council Canada
- Program: Building Regulations for Market Access Report Number: A1-007793
- Report Date: 15 February 2016
- Found to comply with requirement as set in the NBC

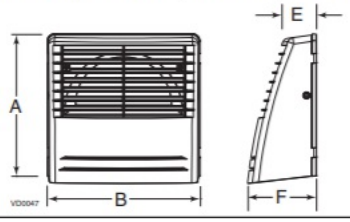
Dimensions of the Dual Outdoor Port Backplate

A	B	C	D
8⅜" (214 mm)	9" (231 mm)	3/4" (19 mm)	3" (76 mm)

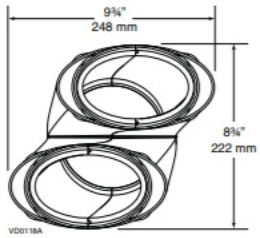


Dimensions of the Dual Outdoor Port

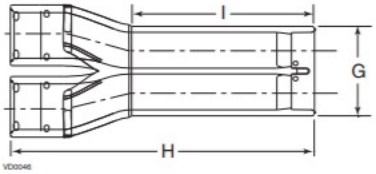
A	B	E	F
8⅜" (214 mm)	9" (231 mm)	1⅞" (48 mm)	3⅝" (92 mm)



Dimensions of the Transition

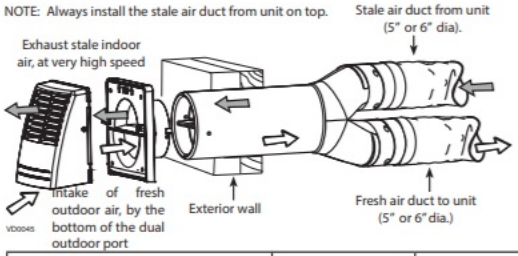


G	H	I
6" (152 mm)	20" (508 mm)	11³/₈" (289 mm)



Installation

NOTE: Always install the stale air duct from unit on top.



Specifications and ratings

- Part number: VTYIK1
- Material for transition:
  Expanded polystyrene, Grade S4 (building material)
- Material for dual outdoor port:
  White polypropylene
- Contamination rate:
  3.2% between stale air to outdoors and fresh air from outdoors

Submitted by:		Date:	Project:
Quantity:	Model number:	Remarks:	Location:
			Architect:
			Engineer:
			Contractor:

BROAN

Broan-NuTone LLC, 926 West State Street, Hartford, WI 53027 (1-877-862-7626)

VTYIK1d180118

Bibliography: See original proposal.

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

RM19-18

IRC: M1505.4.4

Proposed Change as Submitted

Proponent: Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov)

2018 International Residential Code

Revise as follows

M1505.4.4 Local exhaust rates. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table M1505.4.4. Intermittently operated exhaust fans in bathrooms and toilet rooms shall be provided with a delay-shutoff timer or humidity sensor control.

> **Exception:** A delay-shutoff timer or humidity sensor control switch is not required for exhaust fans that function as a component of a programmed whole-house ventilation system.

Reason: This code change provides compliance options for intermittently operated exhaust fans when the bathroom is occupied (manual or humidity sensor activation) and for a limited period of time after the user leaves the room (delay timer or humidity sensor deactivation). Delay timer and humidity sensor exhaust fan controls are a consistent and effective means of removing indoor moisture and pollutants.
During a bath or shower, the humidity level in a bathroom can be a perfect breeding ground for mold, mildew and microorganisms that can negatively impact occupant health. Excess moisture has tremendous potential for damaging the structure. It cracks and peels paint, ruins gypsum wallboard, causes exterior paint failure, warps doors and rusts cabinets and fixtures. It can cause deterioration of joists and framing. As it condenses on windows, walls, ceilings and cabinets, it attracts dirt. It encourages mildew on tile grout and generally provides an environment for increased bacterial growth.

According to the Home Ventilation Institute, an intermittently operated exhaust fan needs to run at least 20 minutes after each shower to sufficiently remove moisture from an average size bathroom. Bathroom exhaust systems reduce the risk of mildew and mold growth, which is a sanitation and durability concern in all homes, regardless of climate. Delay timer and moisture sensor controlled exhaust fans are more effective than a manually operated fan or an operable window that is usually left closed during the winter and summer months of the year.

Automatic shut-off controls help to ensure exhaust fan operates when the bathroom is in use and for a limited period of time after the user leaves the room. Automatic controls also save energy by ensuring fans don't run unnecessarily after removal of moisture and pollutants.

Bibliography:

1. ASHRAE 62.2-2016 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings
2. Home Ventilating Institute - http://www.hvi.org/publications/HowMuchVent.cfm

Cost Impact: The code change proposal will increase the cost of construction
A basic dial delay timer switch costs $15, while a basic humidity sensor switch costs $46. Timer and moisture controlled exhaust fans reduce the potential of making costly moisture damage repairs to correct problems that is easy to avoid with adequate local exhaust.

RM19-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This proposal goes beyond minimum code. This is redundant with other sections in the code. (Vote 10-0)

Assembly Action: **None**

RM19-18

Individual Consideration Agenda

Public Comment 1:

Proponent: David Collins, representing International Code Council Sustainability, energy and high performance code action committee (sehpcac@iccsafe.org)requests As Modified by This Public Comment.

Modify as follows:

2018 International Residential Code

M1505.4.4 Local exhaust systems ~~rates~~. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table M1505.4.4. Intermittently operated exhaust fans in bathrooms ~~and~~ shall be provided with a humidity sensor control or a delay-shutoff timer capable of and configured to delay fan shutoff for not less than 20 minutes. Intermittently operated exhaust fans in toilet rooms shall be provided with a delay-shutoff timer ~~or humidity sensor control~~ capable of delaying fan shutoff for not less than 20 minutes.

> **Exception:** A delay-shutoff timer or humidity sensor control switch is not required for exhaust fans that function as a component of a programmed whole-house ventilation system.

Commenter's Reason: Contrary to the committee statement, this code change is not redundant with other sections in the code. This modification clarifies the requirements by making a distinction between exhaust fan controls in bathrooms for moisture removal and exhaust fan controls in toilet rooms for odor removal.
It is well established that an exhaust fan needs an additional 20 minutes to evacuate the humidity or odor after the use of a bathroom unless a humidity sensor control is employed for moisture removal. These requirements only apply when an exhaust fan is provided in a bathroom in lieu of an operable window and not part of a programmed whole-house ventilation system.

When employed, bathroom exhausts reduce the risk of mildew and mold growth, which is a sanitation and durability issue in homes, regardless of climate. Automatic shut-off controls help to ensure exhaust fan operates when the bathroom is in use and for a limited period of time after the user leaves the room. Automatic controls also save energy by ensuring fans don't run unnecessarily after removal of moisture and pollutants.

This public comment was submitted by the ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors in July of 2011 to pursue opportunities and to improve and enhance assigned International Codes or portions thereof. Each year the SEHPCAC has historically held 3 open face-to face meetings and numerous Working Group meetings, conference calls and webinars. These meetings, conference calls and webinars are public and are convened to facilitate discussion and debate of proposed changes and public comments to the codes by members of the committee, as well as interested parties.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
A basic dial delay timer switch costs $15, while a basic humidity sensor switch costs $46. Timer and moisture controlled exhaust fans reduce the potential of making costly moisture damage repairs to correct problems that is easy to avoid with adequate local exhaust.

Public Comment 2:

Proponent: Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov); Julius Ballanco, JB Engineering and Code Consulting, P.C. (jbengineer@aol.com)requests As Modified by This Public Comment.

Further modify as follows:

M1505.4.4 Local exhaust ~~rates~~ systems. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table M1505.4.4. Intermittently operated exhaust fans in bathrooms with a shower or bathtub ~~and~~ shall be provided with a humidity sensor control or shall be provided with a timer switch capable of operating the exhaust fan for not less than 20 minutes after the fan is manually activated. Intermittently operated exhaust fans in toilet rooms shall be provided with a ~~delay-shutoff~~ timer switch ~~or humidity sensor control~~ capable of operating the exhaust fan for not less than 20-minutes after the fan is manually activated.

> **Exception:** A delay-shutoff timer or humidity sensor control switch is not required for exhaust fans that function as a component of a programmed whole-house ventilation system.

Commenter's Reason: Contrary to the committee statement, this code change is not redundant with other sections in the code. This modification clarifies the requirements by making a distinction between exhaust fan controls in bathrooms for moisture removal and exhaust fan controls in toilet rooms for odor removal.
It is well established that an exhaust fan needs an additional 20 minutes to evacuate the humidity or odor after the use of a bathroom unless a humidity sensor control is employed for moisture removal. These requirements only apply when an exhaust fan is provided in a bathroom in lieu of an operable window and not part of a programmed whole-house ventilation system.

When employed, bathroom exhausts reduce the risk of mildew and mold growth, which is a sanitation and durability issue in homes, regardless of climate. Automatic shut-off controls help to ensure exhaust fan operates when the bathroom is in use and for a limited period of time after the user leaves the room. Automatic controls also save energy by ensuring fans don't run unnecessarily after removal of moisture and pollutants.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
A basic dial delay timer switch costs $15, while a basic humidity sensor switch costs $46. Timer and moisture controlled exhaust fans reduce the potential of making costly moisture damage repairs to correct problems that is easy to avoid with adequate local exhaust.

RM19-18

RM22-18

IRC: 202, M1505.4.3

Proposed Change as Submitted

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

2018 International Residential Code

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

Revise as follows

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1)] **(Equation 15-1)**

~~Exception~~ Exceptions:

1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).
2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by 25%, provided that all of the following conditions apply:

   2.1. A ducted system supplies recirculated air directly to each bedroom and the largest common area.
   2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four hour period.
   2.3. The whole-house ventilation system is a balanced ventilation system.

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

Distributed, mixed and balanced ventilation is more effective at controlling indoor contaminants than typical exhaust ventilation that provides no distribution and mixing. Ventilation with effective distribution and mixing prevents or minimizes high levels of contaminant concentration in various spaces within houses, especially rooms where people spend a lot of time with doors closed such as bedrooms. Distribution and mixing homogenizes interior conditions reducing potentially harmful high intermittent contaminant concentrations in interior spaces. Complex field testing and contaminate transport software analysis have shown that 70% mixing combined with a 25% reduced balanced ventilation is equally as effective as a typical exhaust ventilation.

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

Technical justification for this proposed code change can be found in the following links:

https://buildingscience.com/sites/default/files/migrate/pdf/CP-0909_ASHRAE_Calibrated_Multizone_Airflow.pdf

https://buildingscience.com/sites/default/files/migrate/pdf/CP-0908_ASHRAE_Modifying_Ventilation_Airflow.pdf

https://buildingscience.com/sites/default/files/migrate/pdf/CP-0802_Field_Test_Room_to_Room.pdf

http://www.nrcan.gc.ca/energy/efficiency/housing/home-improvements/18633

https://www.nrc-cnrc.gc.ca/ctu-sc/files/doc/ctu-sc/ctu-n15_eng.pdf

Cost Impact: The code change proposal will decrease the cost of construction
Choosing to use a more effective type of ventilation will result in a lower ventilation rate which could reduce both construction and operating costs.

RM22-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The words "substantially the same" in the definition are subjective. The number of modifications offered indicate the need to revise this proposal in a public comment. (Vote 10-0)

Assembly Action: **None**

RM22-18

Individual Consideration Agenda

Public Comment 1:

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

Further modify as follows:

2018 International Residential Code

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

M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

Ventilation rate in cubic feet per minute =0.01 ~~×~~ total square foot area of house + ~~7.5×number~~ 7.5 number of bedrooms + 1

(Equation 15-1)

Exceptions:

1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).
2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by ~~25%~~30%, provided that ~~all~~ both of the following conditions apply:

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

   ~~2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four-hour period.~~to one or more of the following rooms:

   2.1.1. Living room

   2.1.2. Dinning room

   2.1.3. Kitchen

   2.2.~~2.3.~~ The whole-house ventilation system is a balanced ventilation system.

Commenter's Reason: The words "substantially the same" are made less subjective by describing them as "within 10%" as requested by the committee.
The new 2.1 better describes the "largest common area" as the "living room, dining room or kitchen".

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

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This modification still provides potentially reduced construction and operating costs to those who choose to use balanced ventilation.

RM22-18

RM25-18

IRC: M1505.1, ASHRAE

Proposed Change as Submitted

Proponent: Mike Moore, representing The Home Ventilating Institute (mmoore@newportventures.net)

2018 International Residential Code

Revise as follows

M1505.1 General. Where local exhaust or whole-house mechanical ventilation is provided, the ~~equipment~~ ventilation system shall be designed in accordance with this section, or the ventilation system shall be designed in accordance with ASHRAE 62.2.

Add new standard(s) follows

ASHRAE

ASHRE
1791 Tullie Circle NE
Atlanta GA 30329
US

62.2-2016:

Ventilation and Acceptable Indoor Air Quality in Residential Buildings with Addenda b, d, k, l, q, and s.

Reason: This proposed modification would provide builders with the OPTION of using ASHRAE Standard 62.2 to comply with the ventilation requirements of the IRC without requiring builders to use the standard. ASHRAE 62.2 is the ANSI standard for establishing minimum acceptable indoor air quality for dwelling units. There are several reasons that builders may want to use ASHRAE 62.2 instead of the IRC for compliance, including: greater flexibility for specifying climate-appropriate ventilation controls, ability to achieve energy and cost savings for homeowners by shifting operation of the ventilation system to times when ambient temperature and humidity are favorable, flexibility to specify innovative systems that can be demonstrated to provide equivalent exposure to pollutants, ability to down-size and save money on balanced ventilation equipment versus what may be required by the code, 62.2's use by code-plus programs such as ENERGY STAR and LEED, and ability to size the system as a function of measured dwelling unit air leakage instead of a one-size-fits-all approach.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Use of this standard is proposed as an OPTIONAL path. Costs associated with using 62.2 versus other compliance paths will vary based on the application. As such, this proposal will neither decrease nor increase the cost of construction.

RM25-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: ASHRAE 62.2 could supersede all of Chapter 15 and the builder could use 62.2 under the alternate approval provision in Chapter one. (Vote 10-0)

Assembly Action: **None**

RM25-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Mike Moore, representing Broan (mmoore@newportventures.net)requests As Submitted.

Commenter's Reason: In Columbus, the IMC committee approved M33, which introduced the *option* for dwelling units to comply with the ventilation requirements of the IMC by following the requirements of ASHRAE 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings. To provide consistency across the IMC and IRC, dwelling units in the IRC should also have the *option* of complying with ventilation requirements of the IRC by following the requirements of ASHRAE 62.2. Further, approval of this proposal As Submitted is aligned with the ASHRAE/ICC memorandum of understanding signed in 2006, which states: *Both organizations agree to look for ways to develop appropriate code-enforceable language for ASHRAE standards and provide guidance to support the adoption of ASHRAE standards into ICC codes.*

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction Increasing options for compliance can decrease the cost of construction. See the original proposal for specific examples of potential cost savings and advantages of using ASHRAE 62.2 in place of the IRC ventilation requirements.

RM25-18

RM27-18

IRC: M1504.3

Proposed Change as Submitted

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

2018 International Residential Code

Revise as follows

M1504.3 Exhaust openings. Air exhaust openings shall terminate as follows:

1. Not less than 3 feet (914 mm) from property lines.
2. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors.
3. Not less than 10 feet (3048 mm) from mechanical air intake openings except where either of the following apply:

   3.1. the exhaust opening is located not less than 3 feet (914 mm) above the air intake opening.

   3.2. The exhaust opening is part of an approved factory-built intake/exhaust combination termination fitting installed in accordance with the manufacturer's instructions, and the exhaust air is drawn from a living space.

4. Openings shall comply with Sections R303.5.2 and R303.6.

Reason: Intake/exhaust combination terminations are regularly installed with heating and energy recovery ventilators (H/ERVs) used for dwelling units. Their use reduces building penetrations, labor, and associated system costs. By reducing the number of penetrations, air leakage can also be reduced, resulting in space conditioning energy savings. Further, the durability of the structure can be improved through reducing entry pathways for bulk water.
Manufacturer tests conducted by Natural Resources Canada (NRC) have demonstrated that use of intake/exhaust combination terminations results in minimum cross-contamination of airflows(i.e., not exceeding 4%; see NRC report A1-007793[1]). These results are aligned with ASHRAE 62.2 approval of such devices, which limits cross-contamination to 10%, as verified by the manufacturer. If approved, this proposed modification to the IRC would limit application of intake/exhaust combination terminations to “approved”, “factory-built” units. Approval of this proposed modification is expected to result in more affordable and architecturally flexible terminations.

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

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

Bibliography:

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

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

RM27-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: These fittings are already allowed under the Chapter 1 alternate approval provisions. Some performance data is needed upon which to base an alternate approval. There is no test standard for such fittings. (Vote 8-1)

Assembly Action: **None**

RM27-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Mike Moore, representing Broan (mmoore@newportventures.net)requests As Submitted.

Commenter's Reason: In Columbus, the IMC committee approved IMC proposal M17, which is basically the same proposal as RM27 but for the IMC. Third party testing of factory-built intake/exhaust combination termination fittings has shown excellent separation of supply and exhaust streams (see original rationale for more information), and these devices have been provided by manufacturers for installation with dwelling unit ventilation systems for about 2 decades, with no known failures reported. Included with this comment are examples of these units provided by major manufacturers of ventilation products.
At a minimum, the IRC and IMC should be aligned to ensure that these terminations have a clear path to approval within the code (i.e., like M17, RM27 should be approved as submitted to ensure that the terminations are clearly eligible to be approved). Arguably, until failures or deficiencies of such terminations are documented, there is no compelling reason to require an alternative means and methods process for approval which would add cost and time to projects with little to no benefit to the consumer; so please also approve M16 and RM17 As Submitted which will remove any requirements for special approval of these terminations. In summary, the requested action at the final hearings is As Submitted for the following proposals: M16, M17, RM17, and RM27.

INSTALLATION I (JOIST MOUNTING-I) CONTINUED

10.Install outdoor hood and connect with insulated ducts.

(1) Panasonic recommends the use of the optional Wall Cap (Model: FV-WC04VE1) which is easy to install with one wall penetration and keeps the airstreams separate to minimize short-circuiting. (Fig.4-2~5)

For more details,please check the INSTALLATION INSTRUCTIONS of Wall Cap.

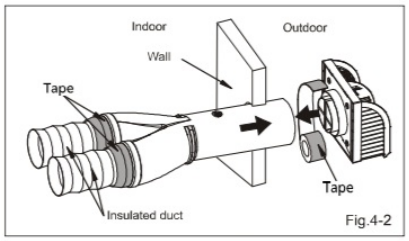


Fig.4-2

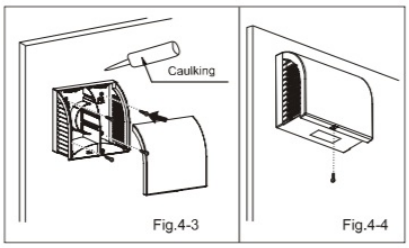


Fig.4-3 Fig.4-4

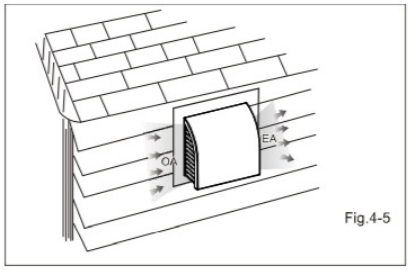
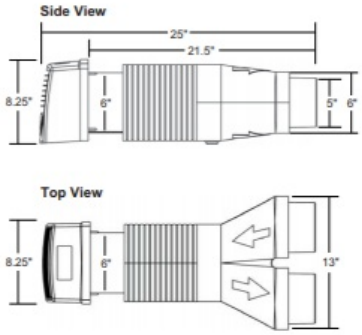
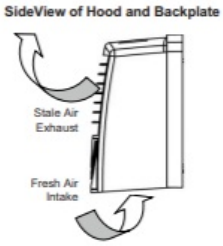


Fig.4-5

Dual Hood Part 99-190

With the Lifebreath Dual Hood, only one 6 in hole is required in the exterior wall to complete two connections: fresh air intake and stale air exhaust.



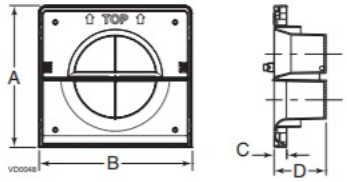


Note

- Tested by: National Research Council Canada
- Program: Building Regulations for Market Access Report Number: A1-007793
- Report Date: 15 February 2016
- Found to comply with requirement as set in the NBC

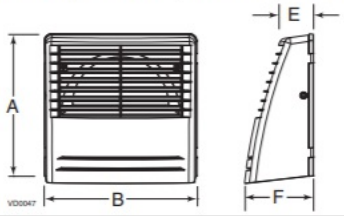
Dimensions of the Dual Outdoor Port Backplate

A	B	C	D
8⅜" (214 mm)	9" (231 mm)	3/4" (19 mm)	3" (76 mm)

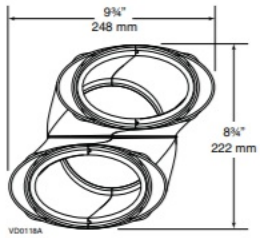


Dimensions of the Dual Outdoor Port

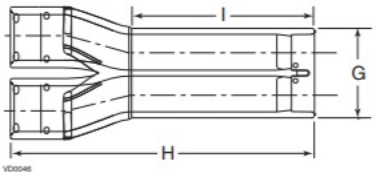
A	B	E	F
8⅜" (214 mm)	9" (231 mm)	1⅞" (48 mm)	3⅝" (92 mm)



Dimensions of the Transition

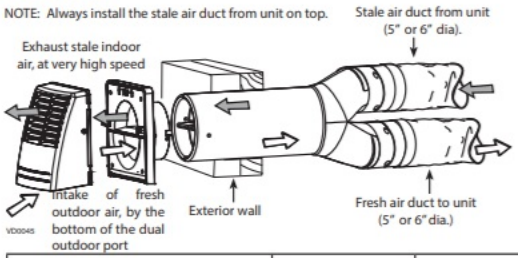


G	H	I
6" (152 mm)	20" (508 mm)	11³/₈" (289 mm)



Installation

NOTE: Always install the stale air duct from unit on top.



Specifications and ratings

- Part number: VTYIK1
- Material for transition:
  Expanded polystyrene, Grade S4 (building material)
- Material for dual outdoor port:
  White polypropylene
- Contamination rate:
  3.2% between stale air to outdoors and fresh air from outdoors

Submitted by:		Date:	Project:
Quantity:	Model number:	Remarks:	Location:
			Architect:
			Engineer:
			Contractor:

BROAN

Broan-NuTone LLC, 926 West State Street, Hartford, WI 53027 (1-877-862-7626)

VTYIK1d180118

Bibliography: See original proposal.

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

RM31-18

IRC: M1601.1.1

Proposed Change as Submitted

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

2018 International Residential Code

Revise as follows

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

1. *Equipment* connected to *duct systems* shall be designed to limit discharge air temperature to not greater than 250°F (121°C).
2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions.
3. Fibrous glass duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards*.
4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC *Duct Construction Standards*~~-~~—*Metal and Flexible* except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A653.
5. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. *Duct systems* shall be constructed of materials having a flame spread index of not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:

    7.1. These cavities or spaces shall not be used as a plenum for supply air.
    7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
    7.3. Stud wall cavities shall not convey air from more than one floor level.
    7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section R602.8.
    7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.
8. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing shall be provided with access.
9. Zoned duct systems shall be designed and installed in accordance with ACCA Manual Zr.

Reason: Currently there is no coverage in the residential code to address the design of zoned duct systems. ACCA Manual Zr provides procedures for designing zoned comfort systems for single family detached homes, duplex and triplex homes, row houses, town houses, and large multi-family structures that are compatible with ACCA Manual J procedures for residential load calculations. In addition, use of Manual Zr will avoid the potential for an improperly designed zoned duct system to adversely impact the safe operation and durability of the heating/cooling equipment. For code officials, Manual Zr has three normative sections to determine clear compliance. Manual Zr is also a consensus-based ANSI standard.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
No cost impacts.

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

RM31-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: ACCA Manual D already refers to Manual Zr. The standard is not yet published. The committee did not review the final version of the draft standard. (Vote 10-0)

Assembly Action: **None**

RM31-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Patrick McLaughlin, Self, representing Air-Conditioning, Heating & Refrigeration Institute (pmclaugma@aol.com); David Bixby (david.bixby@acca.org); Eric Brodsky (ebrodskype@gmail.com); John Brown (jbrown@ewccontrols.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Residential Code

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

1. *Equipment* connected to *duct systems* shall be designed to limit discharge air temperature to not greater than ~~250°F~~ 250 F (~~121°C~~121 C).
2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the ~~manufacturer's~~ manufacturer s instructions.
3. Fibrous glass duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards*.
4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC *Duct Construction Standards— Metal and Flexible* except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A653.
5. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed ~~125°F~~ 125 F (~~52°C~~52 C) and exposed surfaces are not subject to condensation.
6. *Duct systems* shall be constructed of materials having a flame spread index of not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   - 7.1. These cavities or spaces shall not be used as a plenum for supply air.
   - 7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   - 7.3. Stud wall cavities shall not convey air from more than one floor level.
   - 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section R602.8.
   - 7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.
8. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing shall be provided with access.
9. Zoned duct systems shall be designed and installed in accordance with the equipment manufacturer's instructions and ACCA Manual ~~Zr.~~Zr or in accordance with the equipment manufacturer's instructions and other approved methods.

Commenter's Reason: MCLAUGHLIN: RM31 was disapproved at the Committee Action Hearings primarily because the standard was not submitted as the ANSI approved published version at the time. The ANSI approved and published version has been submitted and is the exact same standard that was before the committee. The Air Conditioning, Heating & Refrigeration Institute member companies, who manufacture the effected equipment participated in the development of the standard with the Air Conditioning Contractors Association and strongly feel that ACCA Manual Zr will provide installers with necessary design guidance that will improve the installation of the systems. ACCA has modified the original submittal to clarify that manufactures instructions are also included as they are in the current code. Please approve this public comment

BIXBY: ACCA's public comment provides the final published ANSI/ACCA 11 Manual Zr - 2018: Residential HVAC System Zoning. The final published version is identical to the draft submitted in our original proposal. ACCA Manual Zr specifies procedures for designing zoned duct systems which are not contained in ACCA Manual D for single duct systems. Therefore, it is imperative that Manual Zr be specified by the IRC to avoid the potential for an improperly designed zoned duct system which could adversely impact the safe operation and durability of the heating/cooling equipment. In addition, ACCA requests that the proposal be further modified as underlined below.

9. Zoned duct systems shall be designed and installed in accordance with ACCA Manual Zr <u>and the manufacturer's instructions or by other approved methods</u>.

BRODSKY:

There is no coverage in the residential code to address the design of zoned duct systems. ACCA Manual Zr and the manufacturers instructions provides procedures for designing zoned comfort systems for residential homes, and structures that are compatible with ACCA Manual J procedures for residential load calculations. Use of Manual Zr will avoid the potential for an improperly designed zoned duct system that can adversely impact energy usage,occupant comfort as well as the operation of heating/cooling equipment. An National Association of Homebuilders (NAHB) study demonstrated that a proper zoning strategy could have over a 25% energy savings compared to a non-zoned home, as well as improved homeowner comfort.
Manual Zr is a ANSI standard with normative sections that offer information written with clear code compliance

BROWN:

Manual Zr provides Code Officials and the AHJ, the means to determine whether a residential zone system was installed at a level of competency, that will avoid efficiency losses, equipment failures and most importantly, litigation.
Manual Zr employs a scientifically sound and defendable design methodology, for all currently manufactured types of HVAC Zone Systems.
AHRI member Zoning Manufacturers fully embrace ACCA Manual Zr. Using physics, Manual Zr levels the playing field and effectively homogenizes the zone manufacturer's design guidance.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
MCLAUGHLIN/BRODSKY: However, properly designed zoned duct systems will have long term cost benefit.

BIXBY: This code change will not affect the cost of a zoned comfort system as it represents a nationally-recognized minimum requirement for proper design and installation per manufacturer's instructions.

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

The cost impact of this decision is positive when compared to the current negative cost due to the lack of standardized design guidance.

RM31-18

RM39-18

IRC: Table TABLE M2105.4, Table TABLE M2105.5, NSF

Proposed Change as Submitted

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

2018 International Residential Code

Revise as follows

TABLE M2105.4
GROUND-SOURCE LOOP PIPE

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F876; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18, NSF358-4

TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2
Polyvinyl chloride (PVC)	ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18, NSF 358-4

Add new standard(s) follows

NSF

NSF International
789 N. Dixboro RoadP.O. Box 130140

Ann Arbor MI 48105
US

NSF 358-4-2017:

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

Reason: At the proposal deadline, NSF 358-4 was still a draft standard, but it is expected to be published prior to the public hearing. The balloted draft standard will be submitted with the proposal. Anyone may receive a complimentary copy of this draft standard for the purpose of reviewing this proposal by emailing brown@nsf.org.
These tables contain the acceptable materials for geothermal ground loop pipe and fittings. PE-RT piping and associated fittings are already accepted materials with referenced standards. NSF 358-4 is a proposed ANSI standard written specifically to contain requirements for PE-RT geothermal piping and fittings. Companion standards NSF 358-1 (PE) and NSF 358-3(PP) are already approved in this table. NSF 358-4 addresses performance pressure testing, long term strength, chemical resistance, constant tensile load joint testing, suitability for burial and marking specific to geothermal PE-RT piping systems.

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

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

RM39-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposed standard is not yet published. (Vote 10-0)

Assembly Action: **None**

RM39-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeremy Brown, representing NSF International (brown@nsf.org)requests As Submitted.

Commenter's Reason: NSF 358-4 was rejected by the committee because the standard was not completed at the time of this proposal's submittal. No one spoke against this standard. A draft standard was submitted to the committee at the time of proposal. The standard is complete without any changes from the draft submitted to the committee.
A copy of the standard may be viewed at http://www.nsf.org/newsroom_pdf/NSF_358-4-2018-watermarked.pdf. There is no controversy around this standard. It is the 4th in a suite of NSF Standards covering geothermal pipe and fittings. NSF 358-1 (Polyethylene) and NSF 358-2 (Polypropylene) are already referenced in Tables M2105.4 and Table M2105.5. NSF 358-3 (Crosslinked Polyethylene) was approved as submitted by the committee in P40.

NSF 358-4 Polyethylene of raised temperature (PE-RT) pipe and fittings for water-based ground-source (geothermal) heat pump systems should be added to provide an additional option to the code for this material.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This standard provide an another option for compliance and so is therefore cost neutral.

RM39-18
