**AMENDMENT PROPOSAL**

Please provide all of the following items in your amendment proposal.

**Code Sections/Tables/Figures Proposed for Revision:**
IMC 401.2, 403.1

**Note:** If the proposal is for a new section, indicate (new).

**Proposal:**

**401.2 Ventilation required.** Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by dwelling units complying with the air leakage requirements of the International Energy Conservation Code or ASHRAE 90.1 shall be ventilated with mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

**403.1 Ventilation system.** Mechanical ventilation shall be provided by a method of supply air and return or exhaust air except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 occupancies three stories and less in height above grade plane shall be provided by an exhaust system, supply system or combination thereof. The amount of supply air shall be approximately equal to the
amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

**Note:** Show the proposal using **strikeout**, **underline** format. At the beginning of each section, one of the following instruction lines are also needed:

- Revise as follows
- Add new text as follows
- Delete and substitute as follows
- Delete without substitution

**Supporting Information:**

**Reason:**
This wording has been approved for the 2021 IMC.

After receiving many questions on the ventilation requirements for R-2 dwellings it has become clear that this section of the IMC is not easily understood, agreed with or being enforced as written. A stakeholder group was put together to tackle the issue and to see how we could change the ventilation requirements to be better understood. The group consisted of members from CAPMO, PNNL, Commissioning Agents, Mechanical Engineers, Code Officials, energy raters and energy advocates.

**The mantra of the meeting was:** ""’We either agree that it isn’t required or agree that it is – then we change it."

Here were the discussed issues that we saw:
1. The lack of understanding of R-2’s over 3 stories or 3 stories and less. (IECC definitions of residential and commercial buildings). Most people aren't looking at these definitions in the IECC so they all assume that since an "R-2" is built out of the IBC it is considered a commercial building in the IECC. When they get to the IMC and it starts talking about 3 stories or less and over 3 stories they don't understand why the buildings are treated differently for ventilation or any other requirement. While, from a building science perspective it can make sense why these buildings are separated this way, a lot of education time is spent on this very issue.

**RESIDENTIAL BUILDING.** For this code, includes detached one- and two family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.
COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of “Residential building.”

2: IMC wording is confusing, especially for people who read the IRC Mechanical and the IECC, because they aren't worded the same and it makes it hard to know what the requirements are. Some confusion came in by code officials who were requiring mechanical ventilation for all R-2s, commercial or residential, because they felt that the section below was stating that all envelopes had to be as tight as 3ach/50 even if they weren't tested. We had to go to ICC for an interpretation of the issues because 50% of the people believed mechanical ventilation was required for any R-2 and 50% believed it was only required for R-2s 3 stories or less.

401.2 Ventilation required. Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2-inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

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convey ventilation air shall be designed and installed in accordance with Chapter 6.

3: ICC’s code opinion:

**From:** Jason Toves <jtoves@ICCSafe.ORG>  **Sent:** Wednesday, April 12, 2017 1:07

**To:** Shaunna Mozingo  
**Cc:** Renee Testroet  
**Subject:** RE: Section 401.2 - 2015 IMC

Ms. Mozingo,

Following are the responses to your questions.

April 12, 2017

RE: 15 IMC 401.2

Q1: Are R-2 occupancies in commercial buildings, as defined in the 2015 IECC, required to have a blower door test performed per Section 401.2 of the 2015 IMC?

A1: No, Section 401.2 of the IMC does not require blower door testing of R-2 occupancies in commercial buildings. It requires mechanical ventilation when R-2 occupancies are tested in accordance with Section R402.4.1.2 of the International Energy Conservation Code and the air infiltration rate is less than 5 air changes per hour, without requiring such testing.

Q2: Are R-2 occupancies in commercial buildings, as defined in the 2015 IECC, required to be mechanically ventilated per Section 401.2 of the 2015 IMC?

A2: No, Section 401.2 requires either natural ventilation per Section 402 or mechanical ventilation per Section 403. Section 401.2 only requires mechanical ventilation when R-2 occupancies are tested in accordance with Section R402.4.1.2 of the International Energy Conservation Code and the air infiltration rate is less than 5 air changes per hour, without requiring mechanical ventilation for R-2 occupancies in commercial buildings.

It should be noted that Section R402.4.1.2 of the 2015 International Energy Conservation Code applies to “Residential Buildings” (as defined in the IECC) only.

So now you decide, should ventilation actually be required in R-2 occupancies over 3 stories the same as it should be in buildings of less than 3 stories? Why should it be different when both codes require a tight building envelope with continuous air barriers?

The overarching feeling from the group was: “Everyone is building tight. Hinging
mechanical ventilation on a test is causing a problem. It should just be required for all R occupancies.”

We played around with the wording and finally just decided that it was easiest to just say that if your envelope complies with an energy code you must provide mechanical ventilation. It was that simple so that is what we did.

**Note:** The following items are required to be included:

**Purpose:** The proponent shall clearly state the purpose of the proposed amendment to physical, environmental and customary characteristics that are specific to the City and County of Denver (e.g., clarify the Code; revise outdated material; substitute new or revised material for physical, environmental and customary characteristics; add new requirements to the Code; delete current requirements, etc.)

**Reasons:** The proponent shall justify changing the current Code provisions, stating why the proposal is necessary to reflect physical, environmental and customary characteristics that are specific to the City and County of Denver. Proposals that add or delete requirements shall be supported by a logical explanation which clearly shows why the current does not reflect physical, environmental and customary characteristics that are specific to the City and County of Denver and explains how such proposals will improve the Code.

**Substantiation:** The proponent shall substantiate the proposed amendment based on technical information and substantiation. Substantiation provided which is reviewed and determined as not germane to the technical issues addressed in the proposed amendment shall be identified as such.

**Bibliography** (as needed): The proponent shall submit a bibliography when substantiating material is associated with the amendment proposal. The proponent shall make the substantiating materials available for review.

**Referenced Standards:**

Click or tap here to enter text.

List any new referenced standards that are proposed to be referenced in the code.

**Impact:**

The code change proposal will increase the cost of construction. This proposal will increase the cost of construction but depending on the method chosen to mechanically ventilate (balanced, exhaust only, supply only), the cost typically only includes the cost of a timer/timers for an exhaust fan that is already required in a bathroom so that it runs continuously or down to 25% of the time. There are definitely climates where an exhaust only or supply only system are not recommended but there are more and more options for an economical balanced system that doesn't rely on an ERV or HRV, even though those costs are coming down as well.

The amendment will be more restrictive than the current 2018 but is in line with what was approved in the 2021 IMC.

**Note:** The proponent shall indicate one of the following regarding the impact of the amendment proposal:

- The effect of the amendment proposal on the cost of construction; Increase, Reduce, No Effect:
- The effect of the amendment proposal on the cost of design; Increase, Reduce, No Effect:
- Is the amendment proposal more- or less-restrictive than the I-Codes; More, Less, Same:

**Departmental Impact:**

The cost of review and enforcement/inspection will likely not be effected as all multi-family buildings must get the same treatment now.

November 15, 2005
Note: Indicate one of the following regarding the impact of the amendment proposal:

- The effect of the amendment proposal on the cost of review; Increase, Reduce, No Effect:
- The effect of the amendment proposal on the cost of enforcement/inspection; Increase, Reduce, No Effect:

November 15, 2005