



STILL PIONEERING

## Building Trades Board

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**Date of Meeting:** January 26, 2016

**Subject:** 2009 IRC R303.3 Bathrooms, Exceptions

**Purpose of Report:** To review a request to delete the local amendment to the 2009 IRC regarding bathroom ventilation. 2009 IRC, R303.3 Bathrooms, Exceptions.

**Background:** The local amendment to this section of the IRC was first discussed when the City operated under the 2003 codes. An interpretation by the Building Official was produced in November of 2004 (attached). Since that time, the local amendment has been included with the IRC code version adoptions by the City of Stillwater on the recommendation of the Building Trades Board.

**Discussion:** The request to amend the adopted 2009 IRC R303.3 is brought by a citizen. Please see the attached for an explanation of Mr. Higley's position:

1. The proposal for change from Craig Higley
2. Email from Lomanco Vents Support
3. Technical Bulletin "Effects of Moisture on Insulation Performance"

A standard practice is for the Building Official to put forth code interpretation on a formal manner that is available by a variety of information media. In November of 2004, such an interpretation was produced that clarified Stillwater's position on bathroom ventilation. The language was further codified through Stillwater's local amendments with the adoption of the 2009 IRC, as reflected below.

### **2009 International Residential Code**

R303.3, Bathrooms, Exception, is hereby amended to read:

*Exception:* The glazed areas shall not be required where artificial light and a mechanical ventilation system are provided. The minimum ventilation rates shall be 50 cfm for intermittent ventilation or 20 cfm for continuous ventilation. Ventilation air from the space shall be exhausted directly to the outside or to a properly ventilated attic space complying with IRC section R806. When terminated in a ventilated attic space the exhaust shall terminate not less than 12 inches above insulation so as not to be covered or blocked by insulation and secured to the structure to prevent movement.

Any change to the adopted language must first be evaluated by the Building Trades Board and a recommendation sent forward to the City Council for action.

**Alternatives:** The following alternatives are available to the Building Trades Board:

1. Find that no amendment to the existing 2009 IRC R303.3 Bathrooms, Exception is needed and take no action.

2. Find that the local amendment to 2009 IRC R303.3 should be amended as requested and recommend approval of the text amendment to the City Council.
3. Find that the local amendment to 2009 IRC R303.3 should be amended as identified and stated by the Board and recommend approval of the text amendment to the City Council.

**Prepared by:** Paula J. Dennison, Development Services Director  
**Date of Preparation:** January 19, 2016

**Attachments:**

- City of Stillwater Interpretation, #04-001
- Proposal to the City of Stillwater's amendment to change bathroom ventilation requirements
- Lomanco Vents Support email
- Technical Bulletin, K-Flex USA, TA54



# Interpretation

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## INTERPRETATIONS AND APPLICATIONS OF BUILDING CODES & REGULATIONS #04-001

**Code Section:** IRC R303.3 Bathrooms (amended)

**Effective:** 11/16/04

**Subject:** Ventilation Fan – Termination

**Code Section:** *“Bathrooms. Bathrooms, water closets compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet one-half of which must be operable. Exception: The glazed areas shall not be required where artificial light and a mechanical ventilation system are provided. The minimum ventilation rates shall be 50 cfm for intermittent ventilation or 20 cfm for continuous ventilation. Ventilation air from the space shall be exhausted directly to the outside or to a ventilated attic space.”*

After discussion by staff, the Building Trades Board and further review of the codes related to fans being ducted to the “outside” it has been determined that a properly ventilated attic space or crawl space is considered equivalent to an opening to the outside. Both the Mechanical Code and Fuel Gas Code consider a naturally ventilated attic space or crawl space to be equivalent to the “outdoors” with regards to combustion air. Bath fan exhaust duct should extend at least 12-inches above the insulation or to a height that it will not be blocked or covered by blown-in type insulation and be secured from movement. If possible, exhaust fans should always be vented directly to the outside.

*A Building Division policy is based on an interpretation of a code provision and is subject to change based on new and/or additional information.*

## Proposal to the City of Stillwater's amendment to change bathroom ventilation requirements

It is hereby proposed that the City's local amendment for the 2009 International Residential Code R303.3 be stricken in its entirety. This will eliminate a code amendment that currently allows bathroom exhausts to be discharged directly into a home's attic space.

- *R303.3, Bathrooms, Exception*, is hereby amended to read:

Exception: The glazed areas shall not be required where artificial light and a mechanical ventilation system are provided. The minimum ventilation rates shall be 50 cfm for intermittent ventilation or 20 cfm for continuous ventilation. Ventilation air from the space shall be exhausted directly to the outside **or to a properly ventilated attic space complying with IRC section R806. When terminated in a ventilated attic space the exhaust shall terminate not less than 12 inches above insulation so as not to be covered or blocked by insulation and secured to the structure to prevent movement.**

2009 IRC wording

**R303.3 Bathrooms.** Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m<sup>2</sup>), one-half of which must be operable.

**Exception:** The glazed areas shall not be required where artificial light and a mechanical *ventilation* system are provided. The minimum *ventilation* rates shall be 50 cubic feet per minute (24 L/s) for intermittent *ventilation* or 20 cubic feet per minute (10 L/s) for continuous *ventilation*. *Ventilation* air from the space shall be exhausted directly to the outside.

Purpose:

The purpose and reasoning for this proposal is to stop a building practice that is well known to create degradation of insulation, an environment for mold growth and creating a situation for structural damage to roof joists, ceiling joists and roof sheathing from the added moisture as a direct result from venting bathrooms into the attic space.

The minimum requirements as established in the IRC for attic ventilation was never intended to facilitate the moisture that will be introduced by bathroom exhaust fans. There is no such thing as a properly ventilated attic when it comes to directly adding moisture laden air from a bathroom into the attic. That is why over the years this particular code section has been created and written to state bathroom exhausts is to be vented directly to the outside.

In no case can it be found where a national recognized professional building organization will support or recommend this building practice. In fact the opposite is true; every national recognized professional building organization will recommend that bathroom exhausts be directed to the outside.

Even though builders should already be aware that this particular building practice is not within any sort of good modern day building practices. It is happening on a regular basis specifically because the City has allowed it within its own amendments. Over time as issues eventually become apparent, it will be the homeowners, not the builders, who will be ultimately paying the price for these issues in the forms

of higher utility bills, mold abatement and structural repairs. This is not even to mention that they will need to then run the exhaust to the outside at that time to keep those items from happening again.

Included are two attachments from Lomanco, a manufacturer of attic venting systems and technical bulletin from K-flex which discusses the issues of moisture with insulation and microbiological growth. Though these are only two documents, it would not take any one long to find similar documentation or references on the internet supporting and documenting these opinions and findings.

#### Conclusion

It is my desire as a well-qualified and certified private Building Code Professional practicing within the City of Stillwater, to see that we are practicing sound and necessary building practices. It is time to abolish this practice once and for all with new construction within the City of Stillwater by removing this amendment and start requiring the proper venting of bathroom exhaust in all situations directly to the outside.

Please schedule a time for this request to be brought forth to the Building Trades Board for consideration and action. Let me know of the time and location so I may be in attendance for this board meeting. I am also requesting as the author of this proposal, that if this item is to be brought forth by the City to any other meeting or group that I be included to specifically discuss this proposal.

Thank You

Craig Higley

ICC Certified Master Code Professional

Oklahoma State licensed Unlimited Inspector

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## cahigley

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**From:** Lomanco Vents Support <productsupport@support.lomanco.com>  
**Sent:** Tuesday, October 06, 2015 10:42 AM  
**To:** cahigley@higleyconsulting.com  
**Subject:** [#129227] Exhuast Fans from bathroom exhausting into attics

Craig Higley,

A Lomanco Ventilation Professional has replied to your support request, #129227 with the following response:

Craig,

Thank you for contacting Lomanco.

Lomanco does not recommend venting bathroom exhaust into the attic. If you exhaust a bathroom into the attic, you are adding unwanted moisture into the attic and that isn't good for the ventilation system that's in place. All bathroom and kitchen exhaust need to be vented directly to the outside.

Please let me know if you have any further questions.

Brittney Rogde

We hope this response has sufficiently answered your questions. If not, please do not send another email. Instead, reply to this email or login to your account for a complete archive of all your support requests and responses.

<http://www.support.lomanco.com/support/view.php?auth=o1xoeaaaeabeaaajAD3I7DsR%2BYCw%3D%3D>

## Effects of Moisture on Insulation Performance

K-Flex USA manufactures flexible, closed cell elastomeric insulation materials in both preformed pipe and sheet / roll forms. Flexible, closed cell insulation materials are an ideal choice for use on cold piping systems and anywhere there is a possibility of water or moisture intrusion due to weather, humidity or condensation. Flexible, closed cell insulation materials have several distinct advantages over open cell products such as fiberglass, cotton fiber or moisture absorptive foams such as melamine, phenolic, polyisocyanurate and polystyrene.

**Physical Properties** – Absorption of moisture by insulation products can result in reduction of physical performance characteristics such as thermal conductivity, compression resistance, flexural strength, tensile strength and air erosion. Moisture may also result in delamination or loss of adhesion to a substrate. Wet insulation may cause corrosion of the piping system or substrate. Insulation materials that must rely on a vapor barrier or jacket for moisture resistance are susceptible to moisture intrusion due to improper installation or physical damage during or after installation. Many types of insulation materials must be removed, discarded and replaced once they become wet.

**Microbiological Growth** – Growth of mold is dependent upon several factors: contaminant, food source, temperature range and presence of moisture. Mold and bacteria can thrive in a wide range of temperatures typically found in indoor and outdoor environments and within air handling systems. Viable mold spores are found in the air, and food sources can either be components of the insulation or contaminants deposited on the insulation surface. Moisture can be the result of leaks, wind driven rain, snow or condensation. Insulation materials that absorb and wick moisture provide a potential growth medium for mold. Flexible, closed cell foams resist mold growth by removing moisture from the mold growth equation. Additionally, K-Flex USA elastomeric insulation products are manufactured with a Protective Antimicrobial Agent, which contains an EPA-registered integral mold inhibitor. They are GREENGUARD listed as “mold resistant” materials.

**Thermal Performance** – Thermal performance is determined through test methods such as ASTM C177 or ASTM C518. Test samples are pre-conditioned and k-factors are determined using “dry” insulation. It is generally recognized that every 1% of water vapor intrusion into an insulation material may increase the thermal conductivity of the insulation by 7.5%. While fiberglass may have a better R-value than closed cell insulation when no moisture is present, the comparison changes quickly when moisture is introduced.

On cold systems where insulation thickness requirements have been calculated based on initial R-values to prevent condensation, moisture intrusion may reduce the insulation performance to the point where it is no longer capable of preventing condensation. The reduction in R-value will speed condensation formation, further reducing R-value.

**Summary** – Flexible, closed cell insulation materials naturally resist moisture due to their closed cell structure. Because they resist moisture, they maintain their physical and thermal properties and are highly resistant to mold growth. Flexible, closed cell insulation materials should be specified on cold piping systems to prevent condensation and in any applications where high humidity or water intrusion are possible, such as swimming pool areas, duct lining downstream from cooling coils and exterior (outdoor) piping and ductwork.