MECHANICAL CODE DISCUSSION

Clearing the Air: Ventilation, Infiltration, Exhaust, Make-up, and Combustion Air

THE WORD *Ventilation* is found in the title of **six** of my Code Discussions, first in the 2009 Nov/Dec RMGA Pipeline Newsletter, most recently in the *2024 March/April RMGA Pipeline Newsletter.* Certainly, as homes built today are tighter in construction than those built in November 2009, we must address indoor air quality (IAQ) in new and improved existing buildings.

Revisiting a few definitions from previous discussions:

2021 IRC/IMC: VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space

2021 IRC/IMC VENTILATION AIR. That portion of supply air that comes from the outside (outdoors), plus any re-circulated air that has been treated to maintain the desired quality of air within a designated space.

2021 IMC/IRC WHOLE-HOUSE VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air where operating continuously or through a programmed intermittent

schedule to satisfy the whole-house ventilation rate.

Commentary Comment: Ventilation air is supplied to remove or dilute indoor air contaminants. In the context of IMC Chapter 4, ventilation air is 100-percent outdoor air that is not re-circulated.

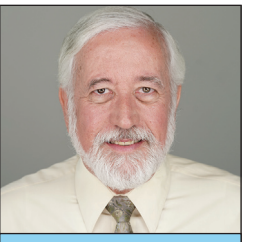
Recently Jamie Schumacher and I have had several discussions on the same subject, identifying several common misunderstandings HVAC contractors, general contractors, design professionals, and inspectors have with the building science and code requirements for ventilation systems. Often these misunderstands lead to poor building performance, poor IAQ, and moisture issues. I've received so many requests for additional information and training on the subject, I will be presenting a 3-hour Utah Energy Code Lunch & Learn Class, January 23, 2025 at the Salt Lake Community College Larry Miller Campus in Sandy. Watch for an announcement on this class.

Codes and construction practices today result in tighter buildings, potentially saving energy, improving comfort, and durability. These tighter building practices reduce infiltration, the uncontrolled leakage of air into a building. Our current energy code includes specific air sealing requirements and in many cases blower door testing of structures, verifying the building has reduced leakage, achieving the level of tightness required by the code.

As building tightness increases, we must address ventilation, bringing in fresh outside air, and/or exhausting contaminants to outside. Contaminants include carbon dioxide, carbon monoxide, chemicals, smoke, moisture, odors, and more.

Discussions in the January ***Lunch & Learn*** and in future ***Code Discussion***s will include:

1. Clarify the definitions for



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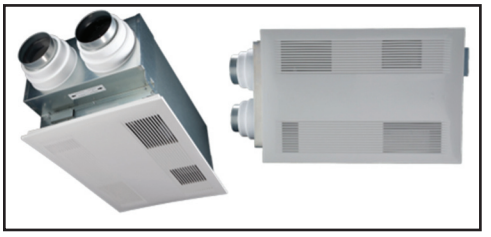

natural, mechanical, whole house, balanced, supply, and exhaust ventilation.

2. Mandatory ventilation requirements – triggers, why, benefits, energy impact, options.
3. Potential building component damage and failures due to improper ventilation.
4. Why not just build a leaky thermal envelope? Or open a window?
5. Residential ventilation calculations – how much air is required.
6. Ventilation using exhaust or supply, or a combination of exhaust and supply.
7. HRV and ERV balanced ventilation system – how they work and benefits.
8. Make-up Air – why and when, can we provide it with the ventilation systems including HRV and ERVs? Range hoods and other exhaust fans exceeding 400 CFM.
9. Tempering make-up air, furnace temperature rise, and the serious potential of damaging heat exchangers due to drawing cold outside air into the furnace.
10. Combustion air from inside or outside. Please do not consider using inside air for combustion in any new construction application.
11. Open combustion vs direct vent gas appliances.
12. Other exhaust systems – bath fans for odors and moisture, dryers (gas and electric), craft rooms, and fireplaces (wood powered exhaust fans). How do we provide proper make-up air with variable exhaust flows.

We'll dig deeper into many of the above items in future discussion and in classes. Please share with me your thoughts, opinions, share experiences, or ask questions. bursenbach@gmail.com

Happy New Year! Wishing you a year filled with joy, prosperity, and exciting new beginnings.

—Brent

WELCOME OUR NEW RMGA MEMBERS!

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