

# MECHANICAL CODE DISCUSSION

## Ventilation



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One of the common challenges in meeting the requirements of any of the International Codes is understanding the definitions in the various Codes. Ventilation as defined in the IRC and IMC is regularly misunderstood, leading to code violations and poor air quality in a structure. Focusing on this term we have:

#### 2006 IRC R202: VENTILATION.

The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

#### 2006 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. **Commentary**

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

### SECTION R303

#### Light, Ventilation and Heating

##### R303.1: HABITABLE ROOMS.

All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be

readily controllable by the building occupants. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

#### EXCEPTIONS:

The glazed areas need not be openable where the opening is not required by Section R310 and an approved mechanical ventilation system capable of producing 0.35 air change per hour in the room is installed or a whole-house mechanical ventilation system is installed capable of supplying outdoor ventilation air of 15 cubic feet per minute (cfm) (78 L/s) per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom.

The key to understanding ventilation is the requirement to have outside air introduced into the home in order to maintain indoor air quality. It is most often confused with circulation- the circulating of the indoor air around the house. Ventilation may be provided by opening windows, doors or louvers or by a mechanical means. Ventilation requirements may be met by:

1. Opening windows, doors and louvers to allow fresh outside air to enter the home.
2. Exhausting contaminated air from the home with ventilation air being provided from outside by 'leakage' into the home to replace exhausted air.
3. Drawing fresh air into a home, by use of a duct introducing outside air in to the return air system or a

fan/ventilator blowing outside ventilation air into the house. Inside air will then 'leak' to outside at a rate equal to the rate outside air is introduced into the home.

Theater rooms under garage are becoming very popular. These rooms typically do not have windows or doors to outside, leading to the necessity to provide mechanical ventilation. Adding a supply air and return air from the typical HVAC system provides circulation, not ventilation. Two of the methods that may be used to provide theater room ventilation follow:

**OPTION 1:** Approved Mechanical ventilation capable of producing 0.35 air changes per hour: Several manufacturers produce very quiet exhaust fans in the range that will work for a home theater. A ventilation fan can be installed with a switch in the theater to be turned on when needed, just as a window may be opened where available for ventilation when needed. If the home is forced air—then the supplies and return to the room will provide a path for replacement ventilation air back into the theater for air that is exhausted. If radiant heated, a transfer duct/grill will be required to let air into the theater.

Consider a 20' X 30' X10' theater:  
 $20' \times 30' \times 10' = 6000 \text{ cu. ft.}$

For 0.35 air changes in an hour:  
 $6000 \text{ cu. ft.} \times .35 = 2,100 \text{ cu. ft per hour}$   
2100 cu. ft per hour divided by 60 min.  
per hour = 35 cu. ft. per minute (CFM)

*Mechanical Code Discussion, cont.*

An 80 CFM fan with a 4" discharge as available will move more than two times what is required. Infiltration will typically be able to provide this small amount of outside air to replace the air exhausted.

**OPTION 2:** Whole house mechanical ventilation system capable of supplying outdoor ventilation air of 15 CFM per occupant computed on the basis of two

occupants for the first bedroom and one occupant for each additional bedroom.

**Four bedroom house:**

<b>Master bedroom:</b>	<b>30 CFM</b>
<b>Other bedrooms:</b>	<b>45 CFM</b>
<b>Total:</b>	<b>75 CFM</b>

Under this option, 75 CFM may be introduced into the return air duct from outside, with the ability on the thermostat to run the fan continuously.

Of course there are other options

such as using energy/heat recovery ventilators, however the above 2 options are simple and relatively inexpensive. If the home is extremely tight construction, the HRV/ERV option may be necessary because there simply is not enough leakage for the other methods to work.

*Thanks for your positive comments, suggestions and questions. If you have a particular subject you would like me to address, please let me know. ☺*

## RMGA Cell Phone Policies Recommended for Use by Individual Employers

### Introduction

Cell phones and personal digital assistant\* (PDA's) are useful devices for individuals and companies and can greatly add to the productivity of individuals and their employers. These communication devices, if used without restriction or common sense, can detract from individual and company productivity and compromise safety. In order to create a productive and safe working environment the use of cell phones and PDA's is restricted.

### Personal Cell Phones

1. Personal cell phones and other PDA's shall not be carried by employees during work hours at shop or job sites. Personal cell phones and PDA's will remain in employee's vehicle, lunch bucket or purse.
2. Personal calls may be initiated or returned during lunch hour or other company established breaks.
3. If there is an emergency, family or friends should initiate contact with employee directly with the company office.
4. The company will not be held liable for the loss of personal cell phones at the workplace.

### Safety and Driving

1. It is a criminal offense to text while driving in the State of Utah.
2. Employees are prohibited from initiating cell phone calls and using related technology (such as, texting, calendaring, browsing i-pods, earpieces, etc.) while driving company vehicles or while driving personal vehicles while performing company business or on the job. This includes time while in slow or stopped traffic.
3. Employees are permitted to pick up calls while driving but must follow these guidelines.
  - The driver must determine that answering the call is appropriate and safe.
  - If the driver answers, he will immediately state he is driving and cannot talk.
  - Within a time not to exceed 5 seconds, if caller indicates



urgency, driver may find safe place to stop and return the call.

4. At all times safety and creating a safe working environment will guide employee's decisions regarding cell phone or PDA usage.

\*Personal Digital Assistant (PDA) is defined as any handheld computer,

mobile phone, smart phone, web browser, or portable media player. Today the vast majority of PDA's are "smart phones," but for the purposes of this policy, PDA's also include non-phone stand alone PDA's and company pagers.

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