

Indoor Air Quality, Code, and COVID

Improving Indoor Air Quality in Compliance with the 2018 VRC/VECC



Although improvements to ventilation and air cleaning cannot on their own eliminate the risk of airborne transmission of the SARS-CoV-2 virus, the **Environmental Protection Agency (EPA) recommends both increasing ventilation with outdoor air and improving air filtration** to make buildings safer for occupants. VRC Chapter 15 Exhaust Systems provides details for the safe installation and operation of all ventilation and exhaust options.

VENTILATION

- Bring in fresh air via one of the options listed below:
 - Install operable windows
 - Provide mechanical ventilation using a supply (positive pressure) strategy
 - Provide balanced mechanical ventilation using an energy recovery ventilator (ERV)
- Exhaust stale and/or polluted air
 - Remove air from the house with bathroom exhaust fans. Adding timer controls allows flexibility with the run times.
 - Install vented range hoods to reduce pollution from cooking activities and provide better overall indoor air quality. When atmospherically vented appliances exist within the building envelope, care should be taken to not create a situation where backdrafting is likely.

FILTRATION

- Properly sized HVAC systems have longer run times which increases total filtration.
- EPA recommends a MERV 13 filter, which traps very small particles, including viruses. The entire HVAC system should be designed and installed to accommodate this level of filtration.
- Ensure air filters fit properly. Air that can move past a filter (instead of through it) will retain pollutants.
- Provide instructions to the occupants on how often the filter should be changed, what size to get, and what MERV rating.
- Locating the air filter at the air handler avoids any return-side leakage that can occur between the return grille(s) and the air handler.

HVAC Filter Effectiveness							
MERV	Dust/Lint	Dust Mites	Pollen	Mold	Pet Dander	Bacteria	Attached Viruses
1-4	✓	✓	✓				
5-7	✓	✓	✓	✓			
8-12	✓	✓	✓	✓	✓	✓	
13-16+	✓	✓	✓	✓	✓	✓	✓

CODE

Mechanical ventilation is required in the 2018 USBC and is achievable through three strategies.

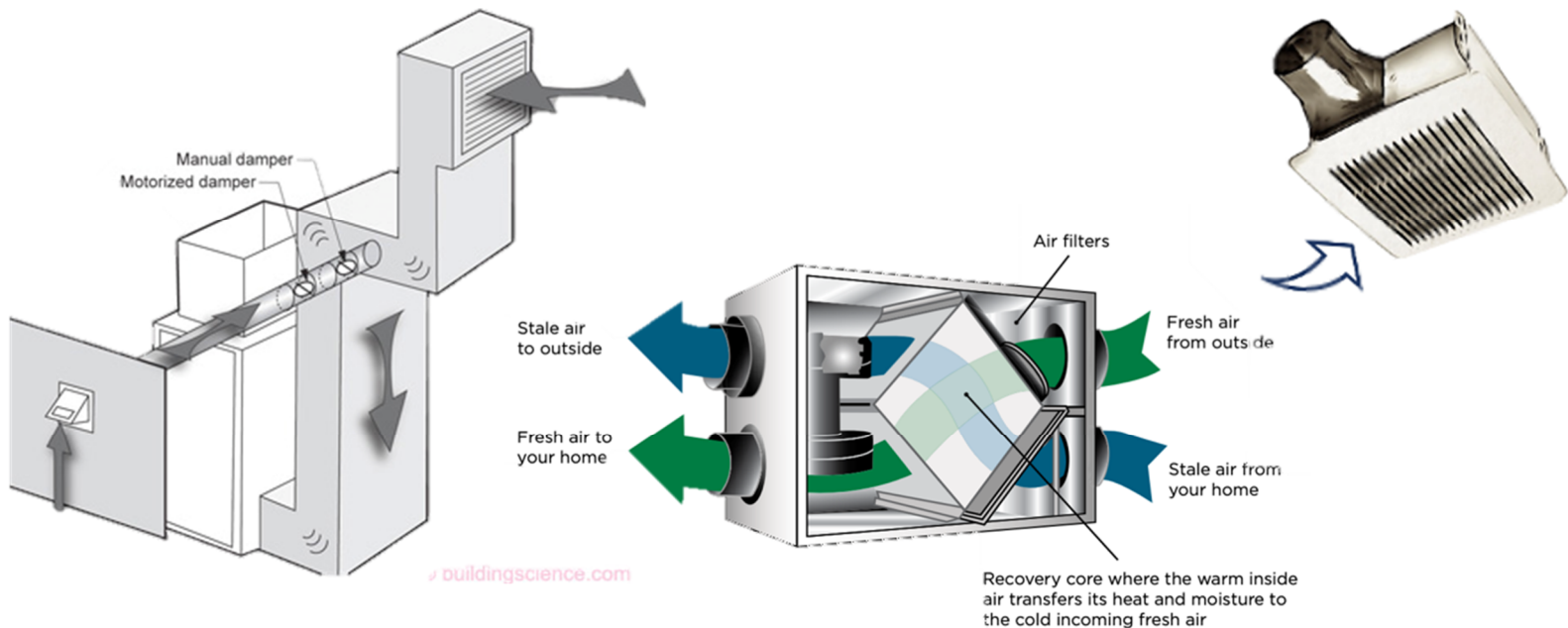
Section N1103.6 (R403.6) Mechanical Ventilation (mandatory)

The *building* shall be provided with ventilation that complies with the requirements of Section M1505 or with other *approved* means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Ventilation Strategies

Various ventilation strategies may be used to meet mechanical ventilation including:

- **Exhaust** or negative pressure exhaust, often via bathroom exhaust ventilation utilizing timed settings to control exhaust ventilation
- **Supply** or positive pressure of fresh air introduced; most commonly circulated through air handler using an electronically-controlled motor
- **Balanced** ventilation where amount of air brought in or supplied is approximately equal to the amount of air exhausted, most commonly via an energy recovery ventilator in Virginia's climate



How much air is required?

The rate of ventilation is measured in cubic feet per minute (CFM) and the amount of designed continuous ventilation is determined by home size (square feet) and number of bedrooms (equals assumed regular number of occupants). If using an intermittent or non-continuous ventilation strategy, the design ventilation is increased by an adjustment factor. (Source: Virginia Residential Code Table M1505.4.3(1))

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

