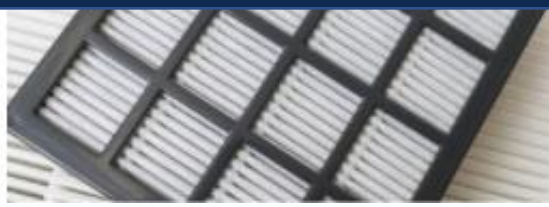
Indoor Air Quality, Code and COVID

Improving Indoor Air Quality in New Construction Homes built under the 2015 Virginia USBC





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 increasing ventilation with outdoor air and air filtration** as important components of a larger strategy that includes social distancing, wearing cloth face coverings or masks, surface cleaning and disinfecting, hand washing, and other precautions.

VENTILATION

- Bring in Fresh Air
  - Install operable windows
  - Provide mechanical ventilation using a supply (positive pressure) strategy or
  - Provide mechanical ventilation using an Energy Recovery Ventilator (ERV)
- Exhaust Stale and Polluted Air
  - Remove air from the house with bathroom exhaust fans. Adding timer controls allows occupants flexibility with the run times.
  - Install vented range hoods. Reduces pollution from cooking activities, providing better overall indoor air quality.

FILTRATION

- Properly sized HVAC systems have longer run times, leading to more air being filtered.
- EPA recommends a MERV 13 filter, which traps smaller particles, including viruses. Ensure that the installed HVAC system is compatible with a MERV 13 filter.
- Ensure the filter fits properly. Air that can move past it (instead of through it) will not be filtered.
- Provide instructions to the occupants on how often the filter should be changed, what size to get, and what MERV rating.

HVAC Filter Effectiveness

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

CODE

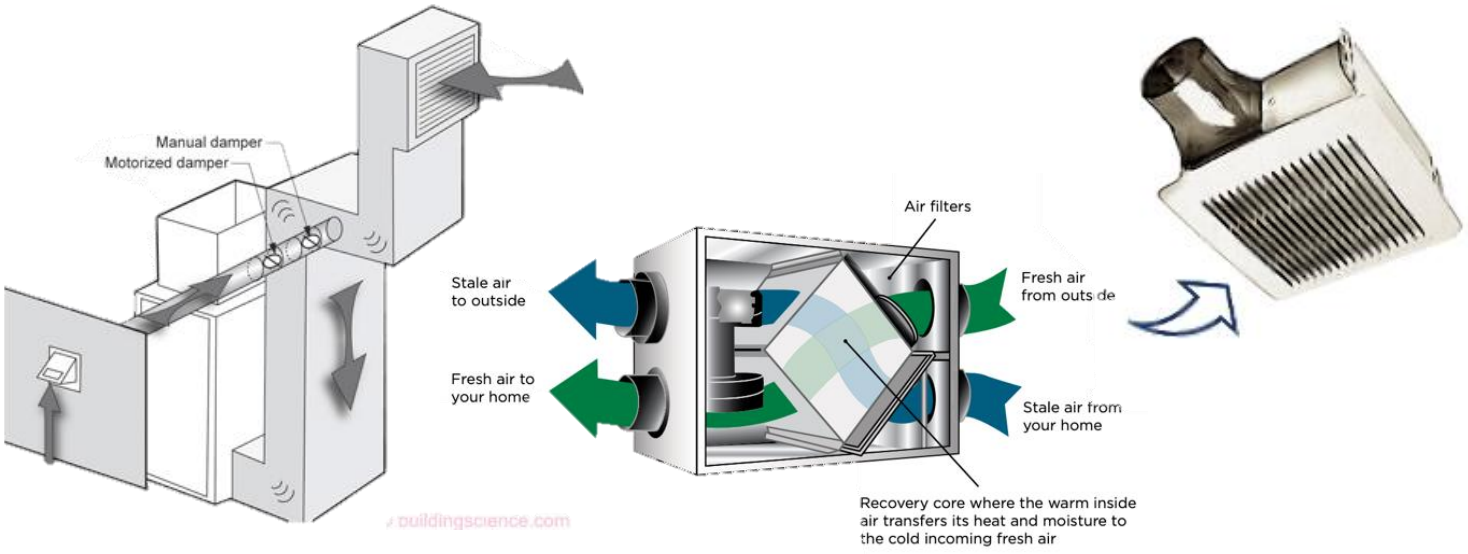
Mechanical ventilation is required in the 2015 Residential Energy Code and is achievable through three strategies. The code reads:

> ***Section R403.6 Mechanical Ventilation (mandatory)***
> *The building shall be provided with ventilation that meets the requirements of the International Residential Code or International Mechanical Code, as applicable, 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 and 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 our 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 (e.g. assumed 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 M1507.3)

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

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