

ENVIRONMENTAL HEALTH

How to combat COVID-19 and other airborne contaminants by utilizing your HVAC system

The information below discusses how your ventilation system can reduce the risk of illness for employees and customers caused by poor indoor air quality. In addition to heating and cooling a building, a properly designed and maintained system will improve the indoor air quality. If the ventilation system is due for maintenance, seek the advice of a qualified HVAC contractor about improvements that can be made. Contact your energy provider about programs they have that will help with cost if your system is due for replacement or major repairs. Energy efficient upgrades might qualify for rebates, grants, and low or no cost loans.

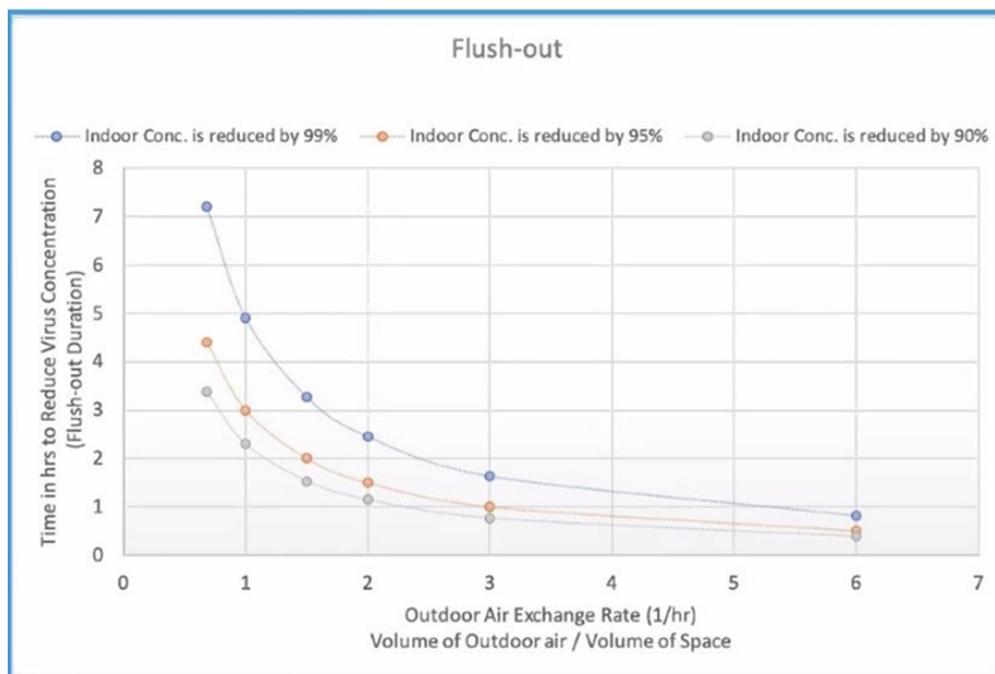
Over the past decade indoor air quality has become an important health and safety concern. According to the Environmental Protection Agency, poor indoor air quality has ranked as one of the top environmental risks to public health. Its invisible and largely unnoticeable, but it's more dangerous than many people realize; whether you're working on a manufacturing floor, in an office building, or in a restaurant, the quality of indoor air can be up to 100 times more polluted than outdoor air. This can be especially dangerous when dealing with airborne bacteria and viruses, such as the virus that causes COVID-19, where transmission is airborne. The purpose of an HVAC (heating, ventilation, and air conditioning) system is not just for cooling and heating. The HVAC system improves the indoor air quality through a process of filtration and ventilation. Ventilation moves outdoor air into a building or a room and distributes the air within the building or room. The general purpose of ventilation in buildings is to provide healthy air for breathing by diluting the pollutants originating in the building, removing the pollutant air from the building, and finally filtering the circulating air. Proper ventilation that provides clean outdoor air is one of the best ways to reduce the risk of disease caused by indoor airborne contaminants.

Mechanical filters are the most common types of filters used in HVAC systems. According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) the term used to describe mechanical filter efficiency is MERV. The rating for MERV is MERV 1 Through MERV 16. The higher the MERV number the better the ability of a filter to remove particles from the air ranging, from 0.3-microns diameter up to 10 microns in diameter. ASHARE recommends a MERV of 13 or 14 to help mitigate the transmission of infectious aerosols. Check with your HVAC contractor to see if your HVAC system is using the highest MERV rated filter it is designed to handle. Older HVAC systems with worn components may not be able to function properly with higher rated MERV filters. Maintaining the HVAC system and filters will improve the efficiency of the system and reduce the risk of spreading disease through poor indoor air quality. The air filters should be changed every 90 days or as recommended by the manufacturer. High efficiency filters such as HEPA filters can remove 99.7% of dust, pollen, mold, bacteria, and any other airborne particles with a size of 0.3 microns or greater.

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The chart below shows increased air flow reduces viruses and other indoor air pollutants with increased air exchanges. Your HVAC contractor can tell you how many outdoor air exchanges per hour the system is designed for and producing.



Source : <https://www.ashrae.org/technical-resources/building-readiness>

Ventilation improvements in consultation with your HVAC contractor can include the following:

- Increase air exchanges, increase filtration if system is suitable
- Increase outside air percentage of air-side economizers. Target 6 changes of outside air per hour if attainable, but minimum of 2 exchanges per hour.
- Ensure that filters are installed properly (correct direction) and fit properly (snugly, with no gaps between adjacent filters) in the filter racks
- Check all filters (should be done quarterly) and change media filters in AHUs, RTUs and similar equipment as required.
- Clean permanent filters in window and packaged terminal air-conditioners quarterly.
- Ensure that cooling coil drains are properly trapped and are draining fully.
- Add in-space air-cleaning such as high efficiency particulate air (HEPA) filters, ultraviolet germicidal irradiation (UVGI, also known as UV-C), or bipolar ionization/photocatalytic oxidation (BPI)b

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Portable and Supplemental Air Cleaners

Portable and supplemental air cleaners can be added when the existing HVAC system is not capable of providing adequate air exchanges or filtration. These units should be sized for the room and operated continuously while the room is occupied. HEPA and UVGI are a couple of technologies used for supplemental air cleaning.

HEPA

Portable High Efficiency Particulate Air (HEPA) air cleaners are useful to capture microscopic airborne respiratory droplets produced when people breathe or talk. These small droplets from the mouth and nose can be suspended in the air and travel throughout a room. HEPA filters are designed to trap up to 99.97% of smog, smoke, and soot particles and can capture viruses attached to these particles or similarly sized droplets.

UVGI

Upper Room Ultraviolet Germicidal Irradiation (UVGI) systems can be used to kill viruses and other microbes in indoor air using low wavelength ultraviolet light. These systems are UV light fixtures designed to kill or inactivate airborne germs in the upper part of the room. UVGI systems do not remove particulates from the air but inactivate suspended bacteria and viruses. According to the CDC, upper room UVGI reduces the transmission of the SARS-CoV-2 virus that causes COVID-19.

Resources:

For more detailed information on resource for funding and information on HVAC and ventilation

<https://www.consumersenergy.com/business/energy-efficiency>

[Compare Incentive Options | DTE Energy](#)

www.michigansaves.org

<https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19>

<https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html>

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/interactive-ventilation-tool.html>

<https://www.ashrae.org/technical-resources/resources>

[Preparing for the New Normal: Employer Readiness Assessment](#)



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