

# HVAC

## Optimization Checklist

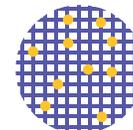
Dilution = Ventilation



**Ventilation** is key in reducing the amount of airborne viral particles indoors. You can reduce this two ways: **dilution and air cleaning.**



**Dilution** happens when you introduce clean air into a space. Most HVAC systems bring in a percentage of outdoor air that is filtered and then mixed with the indoor air. This process forces air in the room to be moved outside and reduces the amount of viral particles indoors by replacing it with filtered, outdoor air.



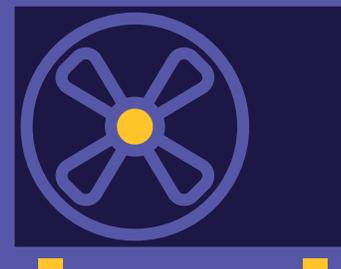
**Air cleaning** reduces the amount of viral airborne particles by filtering them from the air.

**The efficiency of an HVAC system** helps you to understand how much particle removal is happening to the contaminated air once it is inside the system

## How can you know the efficiency of an HVAC system?

The efficiency of particle removal is based on the capabilities of the installed filter which is defined by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Minimum Efficiency Reporting Value (MERV) rating.

Most HVAC systems mix both the return and outdoor air in a mixing plenum that is located before the filter bank. The filtered air returns to the room as cleaner air and replaces the contaminated air that was returned to the central system.



## Things you want to look for or adjustments you want to make to ensure that your HVAC system is efficient as possible according to the CDC:

### 1 Increase the introduction of outdoor air:

Open outdoor air dampers beyond minimum settings to reduce or eliminate HVAC air recirculation. In mild weather, this will not affect the comfort of the building or humidity. However, this may be difficult to do in cold, hot, or humid weather, and may require consultation with an experienced HVAC professional.

Open windows and doors, when weather allows, to increase outdoor air flow. Do not open windows and doors if doing so poses a safety or health risk to people in the building. Even a slightly open window can introduce clean outdoor air.

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- 2 Use fans to increase the effectiveness of open windows**, fan placement is important to safely do this, and will depend on the layout of the room, based on room configuration.

Avoid placing fans in a way that could potentially cause contaminated air to flow directly from one person to another.

Use a window fan, placed safely and securely in a window, to exhaust room air to the outdoors as this will help draw outdoor air into the room via other open windows and doors without generating strong room air currents.

In larger facilities similar results can be established using other fan systems, such as gable fans and roof ventilators.

- 3 Ensure ventilation systems operate properly** and provide acceptable indoor air quality for the amount of people in each space.

- 4 Rebalance or adjust HVAC systems** to increase total airflow to occupied spaces when possible.

- 5 Turn off any demand-controlled ventilation (DCV) controls** that reduce air supply based on occupancy or temperature during occupied hours.

- 6 Set the fan to the “on” position instead of “auto”** in homes and buildings where the HVAC fan operation can be controlled at the thermostat.

- 7 Improve central air filtration:**

Increase air filtration to as high as possible without significantly reducing airflow. Increased filtration efficiency is especially helpful when enhanced outdoor air delivery options are limited.

Make sure air filters are properly sized and within their recommended service life.

Inspect filter housing and racks to ensure appropriate filter fit and minimize any gaps that allow air to flow around, instead of through, the filter.

- 8 Ensure restroom exhaust fans are functional and operating at full capacity** when the building is occupied.

- 9 Inspect and maintain exhaust ventilation systems in areas** such as kitchens, cooking areas, etc. Operate these systems any time these spaces are occupied. Operating them even when the specific space is not occupied will increase overall ventilation inside the building.

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- 10 Generate clean-to-less-clean air movement** by evaluating and repositioning fans, exhaust fans, etc. This recommendation is easier to accomplish when the supply and exhaust points are located in a ceiling grid system.
- 11 Run the HVAC system at maximum outside airflow** for 2 hours before and after the building is occupied in non-residential settings.

## Considerations for an efficient HVAC system from AIHA:

- 1 Keep HVAC systems operational** to maintain indoor comfort and maximize outdoor air based on the HVAC system design. Target to maintain relative humidity at 40-60%.
- 2 If you need assistance on HVAC issues,** ask an HVAC professional and review ASHRAE's COVID-19 preparedness resources for more information.
- 3 Consider using portable high-efficiency particulate air (HEPA) filtration units** that can be adjusted for different room size and ventilation needs.
- 4 If fans, such as pedestal fans or hard mounted fans, are used,** take steps to minimize air blowing from one person directly at another individual. If fans are disabled or removed, it is important to remain aware of and take steps to prevent heat hazards.
- 5 Use natural ventilation** by opening windows and doors to increase airflow, where and when possible.



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