

Improving Indoor Air Quality through Ventilation & Filtration

Providing outdoor air and air filtration for building occupants helps reduce the concentration of airborne contaminants, including viruses. COVID-19 is a respiratory virus that is highly transmissible by air. Improving ventilation is a critical intervention that can help slow the spread of the virus, especially when layered with other prevention strategies such as vaccination, maximizing distance between people, wearing masks, cleaning and disinfecting, and handwashing.

Building owners are encouraged to consult with a State of Ohio registered mechanical/HVAC professional engineer, HVAC designer with American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) certifications, Certified Industrial Hygienist (CIH®), and/or performance management professionals with ASHRAE certifications to improve indoor air quality (IAQ) in their facilities.

Strategies to Improve Indoor Air Quality

Most buildings such as schools, offices, and businesses have heating, ventilation, and air conditioning (HVAC) systems that are maintained by building maintenance or HVAC professionals. These professionals should consult the [American Society of Heating, Refrigerating and Air-Conditioning Engineers \(ASHRAE\) guidance for COVID-19](#) and use the resources linked below to ensure the HVAC system meets or exceeds the minimum recommended outside air and air exchange rate with the highest possible filtration efficiency, while still managing energy efficiency.

The recommendations below are a stepwise approach for effectively improving IAQ:

- I. **Engineering Services:** Use engineering services, such as recommissioning/retro-commissioning to assess existing HVAC systems to determine feasible options for improving IAQ, ventilation, and filtration.
- II. **HVAC System Design:** Ensure levels of outdoor air provided to the room/building match the permit-approved system design documents and ASHRAE 62. Review the HVAC system design before increasing mechanical ventilation.
- III. **HVAC System Maintenance:** Service the HVAC system to ensure ventilation and outdoor air supply systems are operating as designed.
- IV. **Ventilation Improvements:** Modify the HVAC system to meet or exceed the ventilation requirements of ASHRAE 62.1. Consider operable windows to enable natural ventilation.
- V. **Filtration Improvements:** Install MERV 13 or higher filters for HVAC systems and/or deploy portable in-room HEPA filter units.
- VI. **HVAC System Monitoring:** Install temperature, humidity, and carbon dioxide (CO₂) sensors to help identify IAQ issues.

For more information, visit: coronavirus.ohio.gov

Links and Resources:

- [ASHRAE Guidance for COVID-19](#)
- [ASHRAE Guidance: Filtration/Disinfection](#)
- [ASHRAE Guidance: Schools/Universities](#)
- [California Air Resources Board \(CARB\) - List of CARB-Certified Air Cleaning Devices](#)
- [Environmental Protection Agency \(EPA\): Ventilation and Coronavirus \(COVID-19\)](#)
- [EPA: Indoor Air and Coronavirus \(COVID-19\)](#)
- [National Institute for Occupational Safety and Health \(NIOSH\) Indoor Environmental Quality Building Ventilation Action Steps](#)
- [Ohio Schools and SARS-CoV-2: A Summary of HVAC and Plumbing Industry Guidelines](#)
- [Ohio Department of Health: COVID-19 Health and Prevention Guidance for Ohio K-12 Schools](#)
- Centers for Disease Control and Prevention (CDC):
 - o [Ventilation in Schools and Childcare Programs](#)
 - o [Ventilation in Buildings](#)
 - o [Ventilation FAQs](#)
- [U.S. Department of Education: Improving Ventilation in Schools, Colleges, and Universities to Prevent COVID-19](#)
- [Ventilation for Industrial Settings During the COVID-19 Pandemic – Phase II corporate transitional work program.](#)

Definitions:

- **HEPA** - “High Efficiency Particulate Air [filter].” A type of pleated mechanical air filter that can theoretically remove at least 99.97% of dust, pollen, mold, bacteria, and any airborne particles with a size of 0.3 microns (µm).
- **IAQ** – “Indoor Air Quality.” IAQ refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. Understanding and controlling common pollutants indoors can help reduce your risk of indoor health concerns.
- **MERV** - “Minimum Efficiency Reporting Value.” A single number filtration efficiency value used to express the ratio of the downstream-to-upstream particle counts across three particle size ranges. For more information, see the “[Understanding MERV](#)” User Guide created by the National Air Filtration Association (NAFA).

For general questions, contact:

- [BWC’s Division of Safety & Hygiene](#)
- [Ohio Department of Health](#)
- [Ohio Facilities Construction Commission](#)



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