



SCHOOL VENTILATION - COVID-19 FAQs

SOURCES INCLUDE:

ASHRAE Reopening Schools: <https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-reopening-schools.pdf>

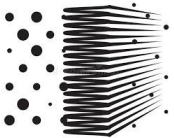
CHPS School Ventilation for COVID-19: https://chps.net/sites/default/files/file_attach/CHPS_COVID-19_Whitepaper_June2020.pdf

VIRUS TRANSMISSION CONCERNS

One of the primary ways viruses can be transmitted is through airborne droplets and even aerosols. Fortunately, the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) has stated, "Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air conditioning systems, can reduce airborne exposures."

VENTILATION OPERATION STRATEGIES

FILTER ADJUSTMENTS



- Ensure current filtration bay and system are sealed properly, and not allowing filter bypass
- Upgrade filter media to highest MERV rating that your system can properly operate without pressure drop concerns, which can damage your ventilation system (Although MERV 13 is recommended, your system may not be appropriate for this filter rating.)
- If HVAC systems are operating in occupied-mode on a constant basis, filters may need to be changed more frequently; so, consider budgeting for additional filter changes
- Use gloves and a face covering for changing and handling filter replacements during pandemic outbreak periods, if replacements can be done safely with the unit under LOTO

SYSTEM CONTROL FUNCTIONALITY



- Alter control settings to remain in occupied mode while building is in use; which may require bypassing occupancy sensors
- Flush with 100% outside air or maximum allowable ventilation for 2 hours, prior to occupants arriving in the building
- Revise Demand Controlled Ventilation (DCV) to monitor and maintain lower CO₂ action levels at a maximum CO₂ level of 800-1000 ppm, or lower (400 ppm) if possible
- Control economizers (if installed on the system) to ensure maximum outdoor air is being provided when outside conditions allow. Ensure economizers are properly functioning
- Minimize return air where appropriate; and bypass energy recovery systems, where feasible, to allow for maximum exhaust of classroom air and to minimize air returning to the system
- Increase ventilation rates to meet or exceed ASHRAE 62.1 for classroom settings, by including your ventilation consultant on how your facility functions. Verify dampers and diffusers are open

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ROOM LEVEL CONSIDERATIONS

OPERABLE WINDOWS AND FAN USE CONSIDERATIONS



- Challenged Ventilated Buildings - Opening windows and doors can increase outdoor ventilation when outdoor conditions (temperature/pollution/humidity) do not adversely impact the interior air. Inserting fans in windows to draw outdoor air into the interior spaces may be optimal when ventilation air exchange challenges exist.
- Updated Ventilated Buildings - Opening windows will also impact the building pressure control and compromise dehumidification and cooling. If new systems are designed and can be utilized to draw in outdoor fresh air, then windows should remain closed. Many units can operate in economizer-mode at low heating and cooling demand levels to provide additional ventilation. Windows should remain closed unless there is no source of interior ventilation or if interior ventilation is not able to meet code.
- All Buildings - Using tabletop/oscillating fans should be limited or eliminated due to their direction of aerosols towards others, and their disruption of the dilution and exhaust flow of the ventilation system to function properly.

NON-VENTILATED SPACES

- If an area has limited or no air exchange or outdoor air ventilation capacity, it **should not be utilized for teaching or as a multi-occupant space**. Non-ventilated areas are not deemed safe in preventing aerosol impact.

UTILIZE BUILDING ASSESSMENTS



- Documenting, reporting, and monitoring CO₂ levels within individual rooms during occupied building times can help to identify and immediately respond to elevated levels. Elevated CO₂ levels suggest air exchanges and outdoor air are not properly ventilating the space.
- Recommissioning/Commissioning/Functional Checklist assessments will provide information regarding how the existing or newly installed systems are functioning, per their intended design and in response to pandemic ventilation concerns. These services should be conducted by a qualified/certified agent.

ENERGY SAVINGS



- Energy savings should not be a primary concern or used as a decision-point during the pandemic period. Sufficient indoor air quality and ventilation for minimizing virus spread will likely require energy increases with system operation.

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SYSTEM ENHANCEMENTS

ULTRAVIOLET-C (UV-C) LIGHT



- UVC light is not currently on the EPA N list for SARS-CoV-2
- In-duct mounted UV lights primarily target the coils or filters & surfaces. The air velocity in a typical duct can be 500-1000 feet/second. This does not allow airborne viruses time to remain in the UV-C light to be eradicated
- The lights are required to be active 24/7 for effectiveness on a coil or filter face.
- UVC is a carcinogen and harmful to human eye/skin contact so you would need PPE and safety protocols to ensure safety when working around them
- UVC Lightbulbs are hazardous waste and if broken can be a mercury spill concern
- Bulbs need to remain cleaned to allow for proper light emittance and replaced annually
- If considered for your facility, a design professional should be consulted as they may not be functional for your space, existing systems or for your building risk factor

BI-POLAR IONIZATION



- Bi-polar ionization is not currently on the EPA N list for SARS-CoV-2
- In-duct mounted air-assist bar ionizer technology is primarily targeting the coils in the system. It appears to have several advantages over UV light. Ionization treatment technology provides a deeper cleaning inside the coil fins
- Like UV-C systems, the air velocity may not allow the system to have an impact on airborne viruses
- Annual testing of the system is recommended to ensure proper ionization is being generated.
- Needlepoint Bipolar Ionization System (NBIS) is one type of an air ionization device, categorized as an air-assist bar ionizer, that can be added to an HVAC system. NBIS is reported by an independent review as not having any harmful by-products.
- Corona Discharge Ionization (CDI) is also a type of air ionization device. CDI produces ozone as a byproduct which can be hazardous

ECONOMIZERS

- Economizers increase outdoor air amounts when cooling is needed, and temperatures are favorable. This measure can increase ventilation
- Aftermarket economizers can be installed on older HVAC systems

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