

General Guidance on Ventilation in Public Schools V8

Approved: January 27, 2022

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Introduction

This document has been created in partnership with representatives of the Departments of Health, Transportation and Infrastructure, and WorkSafe New Brunswick, and is a shared responsibility between each department.

The intent of the document is to provide general guidance on ventilation in school buildings, in the context of COVID-19. The document and direction within are based on expert opinion and literature reviews and are subject to change as information about the spread of COVID-19 and the link to ventilation systems develops, or as the local epidemiology may change.

Occupational Health and Safety

Operators are to refer to Section 20 of *New Brunswick Regulation 91-191* under the *Occupational Health and Safety Act* for general ventilation requirements in indoor workplaces.

Heating, Ventilation, and Air Conditioning (HVAC) Systems

There is currently no evidence of human infection caused by infectious aerosols distributed through ducted ventilation systems. At this time, the risk is considered as being low.

Well-maintained HVAC systems securely filter large droplets containing SARS-CoV-2. Research suggests that properly maintained HVAC systems may have a complementary role in decreasing transmission in indoor spaces.

It is important that mechanical ventilation systems are functioning as intended in order to supply the required design ventilation rates. Operators should maintain ventilation systems as per manufacturer's instructions such as keeping filters clean to help maintain adequate flow rates. Because each system is different, it is critical that each facility has a detailed operational plan that clearly outlines the system's mechanical capabilities, operating procedures, inspection frequency and routine maintenance requirements.

Minimum ventilation rates required to provide acceptable indoor air quality are calculated as part of a system design process to satisfy the prescriptive requirements of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 62. This standard ensures that HVAC systems operate at a capacity that will allow adequate volumes of fresh air to dilute potential contaminants to a safe level. Once the system has been set to fulfill the requirements of the ASHRAE standard, modifications of damper positions in response to the COVID-19 pandemic are not necessary or recommended as these may result in imbalances and reduced air delivery in some areas of the system.

While humidifiers do not remove SARS-CoV-2 virus from the indoor air environment, they could impact the duration that particles that contain virus are suspended in the air, and how long they remain

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infectious. It is therefore important to maintain an optimal humidity level, between 30% and 50% in indoor settings. Lower humidity levels can cause droplets to shrink, and smaller particles (e.g. aerosols) can stay suspended in the air for longer and may also reduce effectiveness of mucous membrane defence mechanisms. However, increasing humidity too much can lead to condensation on surfaces, as well as inside walls and building areas where it cannot be seen. This can lead to mould growth and the proliferation of mites. For more information, see the Health Canada Factsheet: [Relative Humidity Indoors](#).

Specific changes to HVAC systems in response to the COVID-19 pandemic should only occur within the original specifications of the system and are otherwise not recommended. For example, changing from the original filter to one that is not specified for the system could result in stress on other parts of the HVAC system causing damage, and/or in a reduction in the overall fresh air supply.

The use of fans or making adjustments to the system that could cause substantial increases in air flow rates and create turbulent air should be avoided. These practices could re-suspend infectious particles or prevent them from settling.

Filters

Beyond routine filter replacement, maintenance activities should include a visual inspection of filter racks to examine condition, ensure the perimeter is properly sealed and verify that filters are well seated in the rack to minimize by-pass of filter media, improving particle capture. Note that any products used within air plenums are to be listed and permitted for that function.

Filter Maintenance

It is recommended that workers performing maintenance and replacing filters on any ventilation system with the potential for viral contamination wear a properly fitted respirator (N95 or higher), eye protection, gowns or some other barrier method, and gloves.

Natural Ventilation

Providing natural ventilation is necessary in spaces which do not have mechanical ventilation, in order to ensure the comfort and the health and safety of individuals occupying the space.

For school spaces without mechanical ventilation systems, the use of operable windows is recommended when practical to improve indoor air quality. If feasible, open interior doors to promote air circulation.

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Portable HEPA Filter Air Filtration Systems

Portable high efficiency HEPA filter air filtration systems do not introduce additional outdoor air to a space, but may be used to reduce potential for COVID-19 transmission in certain indoor settings. Units may be used in spaces in accordance with Appendix A: General Guidance on Use of Portable Air Filtration Units in Schools. Proper sizing, placement, direction of air flow, operation and maintenance is necessary in order to maximize potential positive impacts of portable air filtration units, and to reduce risks associated with air flow from the units.

Fans

The use of portable or ceiling fans (destratification fans) is not recommended at this time.

Air Conditioner and Portable Air Conditioner Systems

Window air conditioner and portable air conditioner systems that do not introduce additional outdoor air to a space function similar to fans which recirculate room air, and do not purify air. The use of non-engineered air conditioning systems is not recommended.

Ductless Mini-Split Air Conditioning Systems

As is the case with fans and air conditioner systems, these systems do not introduce additional outdoor air to a space and recirculate room air, creating air currents.

However, the use of existing ductless mini-split air conditioning systems is deemed acceptable at this time. These systems are typically located in office spaces with occupancy loads lower than that of classrooms, they are at fixed positions at elevated heights with louvres that can be set to direct airflow away from occupants.

General:

During brief periods where warmer weather may impact building occupants' comfort, options for improving comfort may include:

- Moving activities to cooler areas of the building
- Utilizing window shades or blinds with low openness factor

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- Controls sequencing to circulate cold air at night throughout the building
- Allow for breaks during or between employee shifts/work hours to allow individuals the opportunity to get some fresh air
- Adequate hydration of persons within the building
- Avoid unnecessary movement of persons especially in confined areas

In situations where spaces within a school district rely on heating/cooling systems that are currently not recommended under the *Ventilation in Schools during Pandemic* Guidance document, consideration for such systems will be assessed on a case by case basis.

Appendix A:
General Guidance on Use of Portable Air Filtration Units
Prepared by the Department of Education and Early Childhood Development
January 27, 2022

The intent of the document is to provide general guidance for school districts on use and maintenance of portable air filtration units in schools, in the context of COVID-19. The document and direction within are based on expert opinion and literature reviews and are subject to change as information about the spread of COVID-19 and the link to ventilation systems develops, or as the local epidemiology may change.

Following a third-party literature and research review, it is recommended that portable air filtration units be installed in teaching classrooms which do not have integrated mechanical ventilation systems. At this time, teaching classrooms without mechanical ventilation are the priority. It is not necessary to install in other spaces in schools which are not regularly occupied, which have limited occupancy, or where physical distancing is generally possible such as libraries, cafeterias, gymnasias, etc. The viral load is lower, and the risk of virus transmission through aerosols is lesser in these types of spaces when proper mitigation measures are followed. It is not necessary to install air filtration units in schools/classrooms which have functional mechanical ventilation systems. A properly functioning mechanical ventilation system will provide adequate air change levels, mitigating risk of virus transfer.

Portable air filtration units must be sized for the classroom or learning environment that they are being used in. In larger classrooms and learning environments, more than one HEPA unit may be required, depending on the type of model and its specifications. School Districts can use this table as a guide for unit installations and settings:

An air change rate of 4 Air Changes per Hour (ACH) will allow the portable air filtration system to exchange most of the room air through the filtration device every 15 minutes. This will allow the filter to secure airborne particulates and reduce overall particulate counts in the space. Device placement is critical and should follow manufacturer’s instructions and the guidance of this document.			
Max Classroom Area*	Model	Setting	Number of Units
75m ² (800ft ²)	Beyond Guardian Air	Speed 4	2
46m ² (500ft ²)	Beyond Guardian Air	Speed 3	2
37m ² (400ft ²)	Beyond Guardian Air	Speed 4	1
30m ² (320ft ²)	Beyond Guardian Air	Speed 2	2
110m ² (1,170ft ²)	Airpura Air Purifier	Medium**	2
54m ² (585ft ²)	Airpura Air Purifier	Medium**	1
26m ² (280ft ²)	Airpura Air Purifier	Low**	2
*Classroom volumes are based on an assumed ceiling height of 2.75m (9ft) ** Unit is equipped with variable speed control. High, medium and low control to be determined from the rotary dial on the equipment.			

Installation and Maintenance Notes

- Only use portable air filtration devices approved by EECD
- Follow manufacturers’ instructions regarding placement, usage, maintenance of filters and other consumables
- Place portable air cleaners where air intake and discharge are not impeded (e.g., not near furniture or behind obstructions).

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- Outlet air vents on in-room air cleaners should be placed carefully to avoid causing strong air currents blowing over one person onto others or blowing directly on surfaces that might enable re-entrainment of virus particles.
- Only staff who have received training are to move and/or adjust settings on units.
- Units are to run continuously.
- Where possible, units are to be connected directly to electrical outlets in walls. Where extension cords are necessary, ensure cords are rated for continuous use.