



## Ventilation checklist (COVID-19)

The following checklist can be used as a guide. Pertinent questions are suggested that can be used to assess the suitability of ventilation in the workspace/building that are to be occupied.

According to ASHRAE: "Statement on airborne transmission of SARS-CoV-2. *"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"*. Therefore, engineering or control via ventilation is critical and provides a higher order control.

Question	Y / N	Additional Guidance	Reference/Notes
1. Has the Hierarchy of Controls (HOC) been used to implement physical distancing, appropriate engineering, administrative, and personal protective equipment (PPE) options in that order (Refer to CDC worker protection tool 1) based on a risk assessment?			1
2. Check in with the person in charge of the day to day operation of the heating, ventilating and air conditioning (HVAC) system.		Ask about the status of the HVAC system. For example: Is it running properly? What service does it need? Are its parts clean? Does anything need to be done to make the system work more effectively? Are the Plans and Specifications available for review, just in case? Is there anything else to know?	9

Question	Y/N	Additional Guidance	Reference/Notes
<p>3. Work with building maintenance staff to determine if the ventilation system can be modified to increase ventilation rates or the percentage of outdoor air that circulates into the system.</p>		<p>In buildings with mechanical ventilation systems, extended operation times are recommended. Change the clock times of system timers to start ventilation at nominal speed at least 2 hours before the building usage time and switch to lower speed 2 hours after the building usage time.</p> <p>Where in-demand ventilation systems cannot be converted: change CO2 set point to lower, 400 ppm value, in order to assure the operation at nominal speed (where applicable).</p> <p>Preferably keep the ventilation on 24/7, with lowered (but not switched off) ventilation rates when people are absent. In buildings that have been vacated due to the pandemic (some areas/rooms in offices) it is not recommended to switch ventilation off, but to operate continuously at reduced speed.</p> <p>Exhaust ventilation systems of washrooms should always be kept on 24/7, and make sure that under-pressure is created, especially to avoid the faecal-oral transmission (10). Open windows in washrooms with passive stack or mechanical exhaust systems may cause a contaminated airflow from the washroom to other rooms, implying that ventilation begins to work in reverse direction.</p> <p>Open washroom windows then should be avoided. If there is no adequate exhaust ventilation from washrooms and window airing in washrooms cannot be avoided, it is important to keep windows open also in other spaces in order to achieve cross flows throughout the building (10).</p>	1
<p>4. Ensure the integrity of the water supply system after a prolonged shutdown since standing water may lead to microbial contamination of the HVAC system.</p>			1

Question	Y/N	Additional Guidance	Reference/Notes
5. What are the air changes per hour (ACH) for each room?			1
6. Does the ventilation rate meet minimum ventilation rates as per ASHRAE 62.1 2019?			1
7. Can outdoor air ventilation be increased (disable demand-controlled ventilation and open outdoor air dampers to 100% as indoor and outdoor conditions permit)?			1
8. Can the ventilation rate be increased by providing more outside (fresh) air to more highly (continuously) occupied rooms?			General

Question	Y/N	Additional Guidance	Reference/Notes
9. Check all supply and return grilles and registers to be sure they are open, operating properly and that air is flowing through them when the system fan is on and locations are located on drawings.			9
10. Check outdoor air intakes to assure that they are clean, open and not blocked by bushes, defective louvers, etc.			9
11. Is special attention being given to ventilation in washrooms?		Keep washroom ventilation 24/7 in operation. Avoid open windows in washrooms to assure the right direction of ventilation. Instruct building occupants to flush toilets with closed lid.	10
12. Can the airflow direction be transferred from less occupied spaces to more occupied spaces?			11
13. Can demand control ventilation (DCV) be disabled so that there is a constant supply?			General
14. Can filters be upgraded to MERV 13 or higher filter rating?			General
15. Can more windows be opened allowing natural and fresh outside air without impeding relative humidity and temperature? (with the exception of washrooms where exhaust fans are operating).			General

Question	Y/N	Additional Guidance	Reference/Notes
16. Are the filters appropriately installed?			General
17. Has a check been carried out to make sure there is a seal around the edge of the filters to ensure that there is no by-pass (short-circuit) of air?			General
18. Are the filters within their service life?			General
19. Can the system be run for longer hours (24/7) to enhance air changes in the building space?			General
20. Where possible ensure that offices are not occupied by more than one person, or if this is not possible, provide appropriate distancing and/or physical barriers.			General
21. Is the RH maintained between 40% and 60% which according to scientific literature generally reflects the most unfavorable survival for microorganisms?			4
22. Can portable room air cleaners be added with HEPA or high-MERV filters with due consideration to the clean air delivery rate?			4

Question	Y/N	Additional Guidance	Reference/Notes
23. During shut down, the HVAC systems should not be completely shut down in any building where the building is being unoccupied for any length of time if the intent is to re-occupy the building in the future.			5
24. Is there a program of duct cleaning?		The standard ANSI/ASHRAE 180-2018, Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems, covers good practices for inspecting and maintaining HVAC systems and AHE for the purpose of providing good air quality. The standard can help determine whether cleaning should be performed.	7
25. Where duct cleaning is required, is the company qualified to properly clean the HVAC system.		According to the Federation of European Heating and Ventilation and Air Condition Associates (REHVA, April 2020 (10)), Duct cleaning has no practical effect: “There have been over reactive statements recommending to clean ventilation ducts in order to avoid SARS-CoV-2 transmission via ventilation systems. Duct cleaning is not effective against room-to-room infection because the ventilation system is not a contamination source if above guidance about heat recovery and recirculation is followed. Viruses attached to small particles will not deposit easily in ventilation ducts and normally will be carried out by the air flow. Therefore, no changes are needed to normal duct cleaning and maintenance procedures. Much more important is to increase fresh air supply, avoid recirculation of air according to the recommendations above”.	7
26. Has a risk assessment been carried out and are their proper health and safety procedures in place for contractual / maintenance personnel working on HVAC systems?			12

## References

1. [Resuming Business Toolkit CDC Coronavirus Disease \(2019\)](#), including “Restart Readiness Checklist”.
2. <https://www.ashrae.org/technical-resources/bookstore/standards-62-1-62-2>
3. AHSRAE Coronavirus (COVID) 19 Preparedness <https://www.ashrae.org/technical-resources/resources>
4. [Environmental Health Committee \(EHC\) Emerging Issue Brief: Pandemic COVID-19 and Airborne Transmission.](#)
5. [ASHRAE Position Document on Infectious Aerosols \(April, 2020\).](#)
6. [Does ASHRAE have any recommendations for building owners for how to "mothball" their buildings for an undetermined amount of time and how to operate the HVAC systems during the shutdown](#)
7. What’s Up with Duct Cleaning? Air Handling Equipment Must Be Inspected, Cleaned, and Maintained to Provide Good IAQ BY D. JEFF BURTON (2012).
8. ANSI/ASHRAE 180-2018, Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems
9. Burton, J 2020, Back-to-Work Ventilation-Related Checklist for OEHS Professionals.
10. REHVA COVID-19 guidance document, April 3, 2020
11. INFECTION CONTROL IN ONTARIO COURTHOUSES: THE ASSOCIATION OF ONTARIO JUDGE SERVICES RESUMPTION PLAN Prepared by: ECOH ECOH Project No.: 25857 May 29, 2020
12. REFCOM Building Engineering Services Association, 2 April 2020, Technical Bulletin TB/048/2: COVID-19 and air conditioning systems.

### Other:

[https://www.engineeringtoolbox.com/air-change-rate-room-d\\_867.html](https://www.engineeringtoolbox.com/air-change-rate-room-d_867.html)

<https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards>