



The Chartered
Society for Worker
Health Protection

COVID-19 and Ventilation Frequently Asked Questions

1) Does ventilation matter that much if you have other protection like face masks and social distancing?

Airborne transmission, via small particles from an infected person, can be an important transmission route for COVID-19. Smaller airborne particles can travel much further than the recommended 2 metres distancing from another person, and so social distancing is not totally effective in protecting against breathing in these virus particles. Good ventilation can reduce the transmission risk via the airborne route in an indoor environment by diluting the concentration of airborne particles with a supply of fresh or clean air. Although screens, distance and face coverings can help by controlling larger particles which are expelled from the wearers mouth and nose, the transmission risk still remains from smaller airborne particles, which is why ventilation is also important.

2) Can you use a portable air conditioner to improve ventilation?

Portable air conditioners often recycle the air without removing or destroying infectious coronavirus particles. If the portable air conditioner is fitted with an air purifier (see next question) then they may help to reduce transmission risk from airborne particles. Bear in mind the unit may need to process a lot of air and effectiveness will dependant on the size of the space and how it is used. Most situations will require additional fresh air even if an air conditioner has dual purpose and is also capable of purifying air.

3) Do air purifiers work against COVID-19?

There is some evidence that air purifiers can reduce the amount of infectious material in the air in an enclosed space. These include HEPA filters and UV sterilisation systems. However, factors such as the rate of flow, the number of devices installed (taking into account the population density in the area) and whether the system impacts areas with poor air movement are important in determining their effectiveness and whether they are going to make a significant difference. Before going to the expense of buying such a unit, you should consult an independent ventilation specialist. There may be cheaper and more effective alternatives, such as opening windows or adjusting your existing mechanical ventilation system.

4) Is an open window as good as using air conditioning?

A lot of air conditioning systems just recirculate air within a building without “cleaning” it and therefore should not be used as a replacement for fresh or clean air supply into a room or indoor space. If you have a mechanical ventilation system which brings in a lot of fresh air and vents out potentially infected air, then this can be potentially as useful or better than open windows. You will want to check to see whether your mechanical ventilation system actually does this, by physically checking each of your rooms to ensure it is working effectively in all occupied spaces of your building. Air conditioners won't prevent the airborne spread of Coronavirus particles without introducing fresh or cleaned air.

5) Will leaving our mechanical ventilation on all day and night reduce the risk of COVID-19 infections?

If the mechanical ventilation system brings in fresh air from outside or is fitted with suitable high efficiency filters, which remove small airborne particles from the air passing through the filter, then running the system before and after the space is occupied will help to control risk. Whether it is necessary to run the system all day and night will depend on factors such as airflows, space volume and occupancy levels. What is important is that the system is run for long enough to effectively dilute or purge any contamination from the air within the space.

6) Does hot or cold temperature make a difference to COVID-19 infections?

The environmental temperature alone would not be a major determinant of airborne transmission risk. Temperature may have an effect on the body's response to infection, on air circulation, and on how long the virus can actually survive in the air, and on surfaces. There is some evidence that cold temperatures can promote virus survival in air. Good ventilation is still required to control airborne transmission risk.

7) Will a standard powered toilet extraction system be enough to ventilate our toilets safely?

The standard extraction arrangement required in toilets will help to reduce transmission risk from airborne particles. This must be employed as part of a suite of exposure controls, which ensure workers keep appropriate distance between people, occupancy levels are controlled and good hand and surface hygiene are being maintained.

8) Will a carbon dioxide (CO₂) meter help detect poor ventilation?

Measuring CO₂ concentrations can assist in determining if there is enough fresh air supplied into the room or space to prevent CO₂ building-up as a result of the occupants breathing and talking. But this needs to be done with care - people are the main producers of CO₂, but it may also be produced by industrial processes. In order to use CO₂ as an indicator of how well the space is ventilated, competence is required to establish a suitable measurement regime using the right monitors at times of typical occupancy, and to interpret results and decide on the need for remedial action. You may benefit from engaging a competent occupational hygienist to advise on this if you are unsure. See the Directory of Occupational Hygiene services: [Directory of OH Services \(bohs.org\)](http://DirectoryofOHServices.org)

9) If we have good ventilation (open windows etc) can we dispense with other protections?

No. The principal aim of good ventilation is to control the risk of airborne transmission when in the same indoor space as an infected person. It is part of a suite of established controls including hygiene and distancing, which are needed to be put in place at the same time in order to reduce the risk of transmission by all routes. Social distancing, the use of face coverings, frequent surface cleaning and good hand hygiene will all reduce the potential of transmission.

10) What if I can't open the windows because of noise or air pollution?

Where there the ingress of noise or pollution from open windows cannot be avoided, you may need to consider mechanical ventilation to supply clean air to your workers. Mechanical ventilation systems can effectively filter pollution from the air before it is introduced into the indoor space.

11) Food safety regulations for our chilled foods factory mean that we can't open windows and we need to keep our premises cold - what can we do to prevent against COVID-19?

Specialist workspaces require specialist ventilation solutions. If your factory is installed with a mechanical ventilation system capable of introducing clean, filtered external air, then that should be employed to maximum effect and the recirculation of air within the building space should be minimised. You may also want to explore the provision of a suitable air purifier to the mechanical ventilation system, this is likely to require the support of a competent ventilation engineer.

If you don't have such a system in your factory, then you should look to improve ventilation by natural means and employ things like fly screens to prevent the ingress of contamination (although they will reduce air flow slightly). You should also keep in mind that effective ventilation is only part of the risk control strategy and keeping distance between people, effective environmental cleaning and good hand hygiene are also needed to achieve effective control. And keep in mind that transmission risk in such workplaces is not limited to the production area. Transmission can also occur in shared areas, such as canteens, washing and changing facilities and locker rooms, and it should be possible to effectively ventilate these areas without breaching food safety regulations or to otherwise follow guidance at Guidance for food businesses on coronavirus (COVID-19) - GOV.UK (www.gov.uk)

12) We have a 24hr call centre which has to be operated on site. It's in a sustainably assessed BREEAM building and we have part time and full-time workers rotating shifts (in effect hot desking). Will using our ventilation system be enough?

Buildings which have been designed to optimise energy efficiency still need to have their ventilation systems checked and maintained. The first step is to identify what type of general ventilation system is in place for your occupied areas and ensure that the fresh air intake is maximised. It may be possible to increase fresh air in this setting by opening any trickle vents which may be present, and leaving open internal and external doors, although this has to be balanced with security and fire safety risk assessments. If you cannot limit building occupancy to remove the need for hot desking, stringent cleaning will be necessary between each person using a workstation. You should also keep in mind that effective ventilation is only part of the risk control strategy and keeping distance between people, frequent surface cleaning (especially where hot desking cannot be avoided) and good hand hygiene are also needed to achieve effective control.

13) We work in repair shop which has the bay doors open at all times, surely this will be enough ventilation?

Open bay doors will provide fresh air, so long as this can reach all areas of the workspace people are using. Your building may not be adequately ventilated when there is not a good through draught. As far as possible, remove physical restrictions that do not allow airflow around the workspace. Also, other offices, cubicles and facilities with partition walls separating them from the main shop will need to have their ventilation requirements and safe occupancy considered. If in doubt, the use of CO₂ monitoring, discussed above, may indicate the efficiency of your ventilation in this situation.

14) Does humidity matter?

Humidity may have an effect on how long the virus can actually survive in the air and on surfaces, but the relationship is complex and humidity alone should not be a major determinant of transmission risk. Lower temperature and humidity are associated with enhanced virus survival in air. Good ventilation is still required to control airborne transmission risk. Relative humidity tends to drop in heated indoor spaces in the winter, simple things such as plants in the office can help increase the relative humidity.

15) Is it better or worse to recirculate air? Some of our air conditioning is recirculation.

Recirculating air in a room is a risk if the air is from a place where there are people who may be infected with COVID-19. There is no avoiding the need for fresh or clean air supply into a room or indoor space from either a mechanical system providing fresh/cleaned air, which offers more control, or via natural means. Recirculating air conditioners alone won't prevent the airborne spread of Coronavirus particles.

16) Can I still use a heat recovery system?

Heat recovery can be part of a mechanical ventilation system design. There is a risk of air leakage from the exhaust air to the supply air with these systems which then presents a risk of recirculating air containing COVID-19 particles when an infected person is present. These systems can be used if they are configured correctly and have their pressure balances checked by a competent ventilation engineer and any problems rectified.

17) How can I tell if there are “stale” air areas?

Stale air areas may exist where there is very little airflow and the air remains still and unaffected by ventilation. They can be found in various locations where there are obstructions or physical barriers to free airflow. This may include privacy screens or large items of work equipment. It very much depends on the ventilation in place and how the building is used. The use of some simple tools such as smoke visualisation and CO2 monitors can sometimes help you see what is normally invisible. Observation of the work area is also important, including contextual information such as the number of people, the ventilation in use at the time and the time of year or weather conditions. As always, if you are unsure you should consult a competent indoor air quality specialist, such as an occupational hygienist, to ensure your risk controls are adequate.

18) Is there a “formula” of open window space needed to volume of space to be ventilated that I can use as a “rule of thumb”?

There is approved guidance documents for new buildings to meet the requirements of the Building Regulations, for England and Wales it is Approved Document F Means of Ventilation: ADF_LOCKED.pdf (publishing.service.gov.uk) which provides detail on the size of window opening required for the floor area of each room. Draughts from open windows, especially in the colder months, can be minimised by opening windows at higher levels if possible. This allows for cooler air to be introduced at a height which will then mix with the room air and migrate down into the lower layers of the room where the occupants are located.

19) Is it better to have more people in a well-ventilated space or to have fewer people spread through my building which has not so good places in terms of ventilation?

Effective control depends on controlling the risk by all possible transmission routes using a suite of exposure controls. Keeping distance between people at all times is still one of the best defences against COVID-19, specifically protecting against direct person to person contact. High occupancy rates are seldom going to be mitigated against sufficiently by ventilation if there is no distancing between people. Increasing the amount of fresh air into a space does not reduce the risk from close range transmission of COVID-19. If you are unsure you should consult a competent specialist, such as an occupational hygienist, to ensure your risk controls are adequate.

20) Will changing my heating settings improve ventilation through convection?

Convection can help mix and move air, but this is not likely to make a significant impact.

21) Do I need to do special cleaning for my ventilation systems?

Ventilation systems can theoretically hold small amounts of infectious material. Normal precautions and detergents should be effective in addressing this risk.

22) Will local exhaust ventilation (LEV) on our plant and machinery assist with ventilation from the point of view of COVID-19 protection?

LEV increases localised airflow as it draws the air into the system from the workspace. Where this draws in fresh/clean air from outside the room, it is likely to have a positive effect on air movement in the area it is located. However, LEV is used to control airborne contaminants at source and therefore does not aim to provide ventilation for the general area or building. If you are unsure you should consult a competent specialist, such as an occupational hygienist, to ensure your system design is appropriate.

Definitions Used in the FAQs:

Air conditioning unit: a system for controlling the humidity, ventilation, and temperature in a building

Air cleaning or purifying unit removes particles like dust, pollen, allergens and mold from the air that passes through the filter within the unit before being returned to the workplace air.

BREEAM Building Research Establishment Environmental Assessment Method. A sustainability and certification assessment method that is used to masterplan projects, infrastructure and buildings.

CIBSE Chartered Institution of Building Services Engineers

CO2 Carbon dioxide

IAQ Indoor Air Quality

HVAC Heating Ventilation and Air Conditioning

Additional information on ventilation relevant to the control of COVID risk can be found in the following documents:

CIBSE COVID-19 Ventilation Guidance CIBSE - [Emerging from Lockdown](#)

SAGE Environmental and Modelling Group Paper 'EMG Role of ventilation in controlling SARS-CoV-2 transmission, 30 September 2020' [EMG: Role of ventilation in controlling SARS-CoV-2 transmission, 30 September 2020 - GOV.UK \(www.gov.uk\)](#)

REHVA COVID-19 guidance document, August 3, 2020. 'How to operate HVAC and other building service systems to prevent the spread of the coronavirus (SARS-CoV-2) disease (COVID-19) in workplaces' [REHVA COVID-19 guidance document V3 03082020.pdf](#)

ACGIH 'White Paper on Ventilation for Industrial Settings during the COVID-19 Pandemic'
[ACGIH White Paper on Ventilation for Industrial Settings During Covid-19 2020 08.pdf \(uwsp.edu\)](#)

World Health Organization '[Roadmap to improve and ensure good indoor ventilation in the context of COVID-19](#)'