Why have Ventilation in offices?

Why have ventilation in offices? We have been asked this a few times and there are actually several reasons. The question is more important at the moment with the current Covid 19 pandemic as people are worried about being inside enclosed spaces without ventilation.

Although this issue has been brought to many peoples attention, fresh air in offices is actually a legal requirement in order to comply with Building Regulations.

Refurbishment Projects

When we carry out refurbishment projects that affect fire escape routes, general fire protection separation in offices and warehouses we have to submit plans to Building Control to get approval. Part of the things they look for is in Part F which relates to ventilation and there is a required to supply a certain rate of air in litres per person. We therefore have to calculate the correct size unit for the number of people.

What about Windows?

Most offices have windows. In theory you could argue that as the office has windows it has fresh air ventilation so does not need any mechanical method of delivering it. How many people have the window open though? Particularly in winter when there is a howling gale outside as well as raining horizontally. People are just not going to open them. The best way to ensure that you have fresh air is to have a proper VAM unit installed.

CO2 levels

Although we can focus on C02, as well as being easily measured with a meter, there is an actual impact on people in terms of their performance if the C02 levels are too high. C02 is carbon dioxide and is a by product of combustion. Humans produce it when they breath.

Carbon dioxide levels and potential health problems are indicated below:

- 250-350 ppm: background (normal) outdoor air **level**.
- 350-1,000 ppm: typical **level** found in occupied **spaces** with good air exchange.
- 1,000-2,000 ppm: **levels** associated with complaints of drowsiness and poor air

The effect on office staff when C02 levels are above 1000 ppm cannot be under-estimated. If your office feels stuffy and there is a general lethargy in the mid afternoon where everyone needs more coffee and less is produced, there is probably not enough fresh air in the space.

Opening a window is good, and will create a difference but this is not always possible. In order to get the correct flow rates, and ensure that the air is filtered then a VAM unit needs to be fitted.

Table 6.1a Extract ventilation rates

Room	Extract rate
Rooms containing printers and photocopiers in substantial use (greater than 30 minutes per hour)	Air extract rate of 20 l/s per machine during use. Note that, if the operators are in the room continuously, use the greater of the ***extract*** and ***whole building ventilation*** rates
Office sanitary accommodation and washrooms	***Intermittent*** air extract rate of: 15 l/s per shower/bath 6 l/s per WC/urinal
Food and beverage preparation areas (not commercial kitchens)	***Intermittent*** air extract rate of: 15 l/s with microwave and beverages only 30 l/s adjacent to the hob with cooker(s) 60 l/s elsewhere with cooker(s) All to operate while food and beverage preparation is in progress
Specialist buildings/spaces (e.g. commercial kitchens, sports centres)	See Table 6.3

Table 6.1b Whole building ventilation rate for air supply to offices

	Air supply rate
Total outdoor air supply rate for offices (no smoking and no significant pollutant sources)	10 l/s per person

Table 6.2a Ventilation for offices with natural air supply – ventilation provisions

Extract
Extract rates as per paragraph 6.10[1,2]

Whole building ventilation
See CIBSE Application Manual AM 10: *Natural ventilation in non-domestic buildings*.

Purge ventilation
See CIBSE Application Manual AM 10: *Natural ventilation in non-domestic buildings*.

Notes:

1. ***PSV*** can be used as an alternative to a mechanical extract fan for office sanitary, washroom and food preparation areas.
2. When an open-flued appliance is provided in a building with mechanical extract, the spillage of flue gases could occur. The open-flued appliance needs to operate safely whether or not the fan is running, and further guidance is provided in BS 5440-1 which applies for up to 70 kW appliance input.

Table 6.2b Ventilation for offices with natural air supply – location of ventilators in rooms

Extract

- Extract ventilators should be located as high as practicable and preferably less than 400 mm below the ceiling. This will tend to remove pollutants from the breathing zone of the occupants as well as increase the effectiveness of extracting buoyant pollutants and water vapour.
- For ***PSV***, extract terminals should be located in the ceiling of the room.

Whole building ventilation

- See CIBSE Application Manual AM 10: *Natural ventilation in non-domestic buildings*.

Purge ventilation

- See CIBSE Application Manual AM 10: *Natural ventilation in non-domestic buildings*.