



## **Air Cleaners – Your Questions Answered**

**May 2021**

### **1. Room Air cleaners – an explanation**

Room air cleaners are self-contained units that sit in the room they are to serve and must be plugged into an electrical power socket. They typically comprise a filter or multiple filters and a fan that sucks room air in over the filter system and discharges purified air back into the room. As air moves through the filter, pollutants and particles are captured.

### **2. The difference between a room air cleaner and an air purifier**

Air cleaners contain high efficiency filters (HEPA filters) that removes contaminants from the air circulated through them while air purifiers sanitise the air by emitting negative ions, ozone, utilizing heat or with UV or UVC lamps.

### **3. When Room air cleaners or Air Purifiers can be used:**

Where the practical measures for the deployment of good ventilation practices have been undertaken, and poor ventilation continues to exist in a particular room/area, air cleaners may be considered as an additional measure in conjunction with other methods of ventilation that are available. In such a scenario you should consider a room air cleaner with a HEPA filter.

### **4. Ultraviolet radiation technology:**

Ultraviolet radiation (UVC) technology use ultra violet lamps and have been typically utilised in areas such as healthcare settings to sterilize operating theatre type spaces. Ultra-violet lamps should not be used to disinfect hands or other areas of your skin. Exposure of the eyes and bare skin to UVC radiation must be avoided. Rooms cannot be occupied while direct UVC devices are activated and the lamps are emitting, therefore use of direct UVC lamps is limited to sterilisation of spaces between uses and cannot assist with removal control during occupancy. UVC can feature in occupied spaces as an integrated part of an enclosed clean air unit. If considering direct UVC technology, professional advice should be sought from a Chartered Building Services Consulting Engineer.

### **5. Sourcing an air cleaner**

It is best to identify local/ national suppliers of air cleaners through local contacts or web searches and consult with them to best match your requirements. You should use the guidance in appendix one of the **Practical Steps for the Deployment of**

**Good Ventilation Practices in Schools V3 May 2021** to help you understand the areas to consider during this consultation. If following consultation with a supplier a school feel that their individual space may require specific technical specialist advice, then the assistance of a Chartered Engineer or Registered Architect should be sought.

**6. Air cleaners can be bought or rented**

Units can be purchased outright or rented from hygiene service suppliers and hire companies (these rental companies often maintain the units also).

**7. Choosing an appropriate air cleaner**

Room air cleaner selection is dependent on the particular setting and it is not possible to give a “one size fits all” solution, or a simple rule that everyone can follow.

**8. Air Filters**

Air cleaners typically use mechanical filtration, meaning that their filters physically trap the pollutants that pass through them. Air cleaners normally have at least two such filters: a pre-filter, which catches large particles of dust, pollen, insects and animal hair, and the main filter, which nabs smaller pollutants. The pre-filter is a filter that removes large unwanted contaminants from the air. The pre-filter can be disposable or capable of being washed or vacuumed. The pre-filter also has a role in the extension of the life of the more sensitive filters that come after the pre-filter such as the HEPA filter. Air cleaners that are based on filtration with a HEPA filter are likely to be most effective.

**9. Air cleaner sizing and choice**

It is important to select a unit that is capable of dealing with the needs of the space it is to serve. Small desktop devices aren't effective in large spaces, while larger air cleaners may be an overkill in smaller rooms. One metric included in air cleaning unit specifications is the unit's ability to deliver either air flow in m<sup>3</sup>/hour or air change rate in air changes per hour (ACH). This metric is normally included in the air cleaning unit performance data sheets.

Most air cleaners are labeled with a clean air delivery rate (CADR) number. The CADR defines an air cleaner's effectiveness in reducing particles and is typically expressed in m<sup>3</sup>/hour. In general, the higher the number, the more particles the air cleaner can remove and the larger the room the device can reasonably be expected to clean.

**10. Using an air cleaner to support natural ventilation**

It is important to remember that you are using the air cleaner as a support to your natural ventilation and this should be taken into account when selecting your unit. It should be selected to bridge the ventilation gap in the short terms until a permanent ventilation solutions is put in place.

**11. Air cleaners' impact on CO<sub>2</sub>**

Air cleaners do not remove CO<sub>2</sub>. Fresh air dilutes CO<sub>2</sub> levels. Therefore the introduction of an air cleaner into a room will not impact on the CO<sub>2</sub> readings but will assist in removal/ control and provide an additional measure of precaution where poor ventilation exists.

**12. Air Cleaners as an additional measure**

Air cleaners should not be used to replace ventilation. They are an additional measure of precaution where poor ventilation exists and should be used in conjunction with other methods of ventilation that are available.

### **13. When to use the air cleaner**

There is no benefit to leaving an air cleaner running when the school is closed. They should only be run when the room is in use during the day.

### **14. Air cleaners and noise**

Air cleaners have internal fans that pull air through a series of filters. Some of these fans are low noise emitting, especially on low settings, while others may be noisier as the speed is turned up. It is important to choose a device that suits the required noise levels of the space the unit is serving. This can be assisted by selecting the unit that can deliver the required ACH and CADR at its mid/lower speed settings. For information on acoustic performance in various school spaces see

<https://www.education.ie/en/School-Design/Technical-Guidance-Documents/Archived-Technical-Guidance/TGD021-5-Acoustic-Performance-in-New-Primary-Post-Primary-School-Buildings.pdf>.

### **15. Maintenance of air cleaners**

Filters have to be replaced periodically based on their usage. Therefore, it is necessary to keep a record of the unit's running hours and follow the manufacturer's recommendations on filter cleaning and replacement. It may be a good idea to have some spare filters in stock.