



PROTECTION AGAINST AIRBORNE VIRUSES

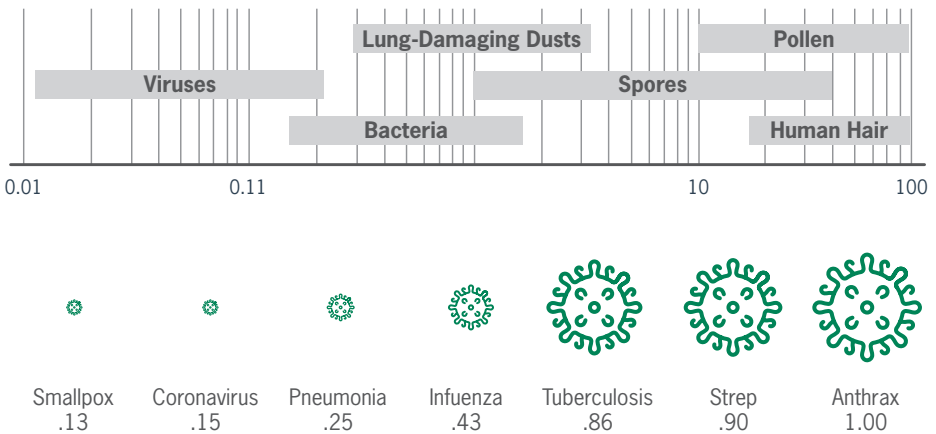
Considerations for choosing your clean air solutions for your work place.



What are viruses?

Viruses are microscopic parasites, generally much smaller than bacteria, that can cause illness in humans. Viruses have a reputation as being the primary cause of contagion as they can often spread from person to person. The size range of viruses can vary depending on the individual virus strain. The image below gives standard sizes of these viruses.

Particle size/diameter (microns)



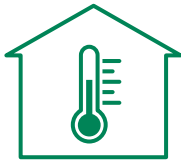
Becoming airborne

Viruses are released into the atmosphere in droplet form by humans coughing, sneezing, talking and even singing. When these viruses are released they can attach onto airborne particles to remain airborne. The WHO have acknowledged that this could be the case for Covid.

1) https://wwwnc.cdc.gov/eid/article/26/9/20-1806_article

Viruses in the air

Did you know that viruses can survive in the air up to 16 hours according to recent studies. The survival of viruses in the air is dependent on a number of factors.



Affects of room temperature on viruses

There are certain optimal conditions that will allow for the survival of viruses. In experiments conducted by K.H Chan et.al. it has been noted that temperatures of between 22-24°C allowed viruses to survive for up to 5 days. When temperature was increased above 38°C the factor reduced.



Ventilation rates and viruses

Ventilation rates can help dilute and remove airborne viruses from the air. In poorly ventilated areas, viruses can often survive longer and transmission between persons can become higher. Increased ventilation rates can help remove these viruses from the air.



Humidity and viruses

Along with temperature, K.H Chan et al. noted that relative humidity played a factor in the survival of viruses. Optimal relative humidity levels were noted to be below 40% while RH values >95% reduced the survival time of viruses.



Particulate levels

Viruses survive in the air by attaching themselves to larger airborne particulates. When particulate levels are high in the indoor environment the virus droplets have more opportunities to attach to airborne particulates and take longer to fall to the ground.

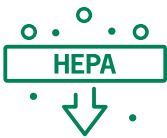
Viruses and your HVAC system

During the Covid 19 pandemic, REHVA (Federation of European ventilation and air conditioning association) released guidelines for businesses to follow to help protect them from the spread of airborne contaminants within buildings. These guidelines are designed to improve ventilation rates in your workplace to help protect against the spread of airborne viruses.



100 % supply air

Where possible, all ventilation systems should utilise 100% supply air. This will help the dilution factor within your building. Using the right HVAC filter will help reduce airborne particulates in the air.



HEPA barrier

When recirculation is mandatory within your HVAC system a HEPA barrier should be put into place to reduce the spread of internal contaminants.



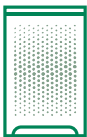
Work safety

Ensure adherence to local guidelines and recommendations for social distancing and practices. These standard practices will reduce the risk from the spread of airborne viruses.



Sanification

Regimented sanitification programmes during workplace downtime should be created for added protection.



Air purification systems

These can be used to help supplement your HVAC system to increase air changes as well as reducing particulate levels generated by indoor contaminants.

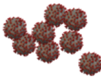






Choosing the right HVAC air filter

The HVAC filter in your AHU is an important component to help and reduce the particulate level within your building. This is an important factor to stopping the spread of airborne contaminants such as viruses. As stated previously viruses survive in the air by attaching themselves to airborne particulates. This means that the less particulates in the air the less chance of the virus surviving in the air.

When using REHVAs recommendation for 100% supply air it is important that the clean air introduced follows this same principle and low particulate levels are introduced to help stop the virus droplets from staying suspended in the air.

The increased levels of supply air will assist with the recommendations to increase air changes. The number of air changes that your facility requires will be based on a number of factors including - level of occupancy and activities undertaken on site. Some figures base this on a litres per second per person (Recommended at 8 l/s per person) approach while others recommend a number of air changes required for a room.

To help understand how efficient your HVAC system is against different particulate ranges we have created the below chart. Using the ISO16890 efficiency ratings of different filter types we can see how much extra protection an ePM1 85% bag filter will give you when compared to ePM1 60% bag filters. By ensuring a reduction in the full range of particulates (From 0.3-1µm) we can improve the protection of the people within our buildings.

PARTICLE SIZE TEST RANGE	FRACTIONAL EFFICIENCY VALUES ACCORDING TO ISO16890-1:2016					
 <p>Virus particle size range in micrometers (µm)</p>	 <p>ePM1 60% Opakfil</p>	 <p>ePM1 60% Hi-Flo Bag</p>	 <p>ePM1 70% Opakfil</p>	 <p>ePM1 70% Hi-Flo Bag</p>	 <p>ePM1 80% Opakfil</p>	 <p>ePM1 85% Hi-Flo Bag</p>
0.3 - 0.4	54%	48%	62%	57%	79%	80%
0.4 - 0.55	62%	57%	70%	67%	85%	87%
0.55 - 0.7	67%	67%	78%	77%	90%	93%
0.7 - 1.0	73%	75%	86%	86%	95%	96%

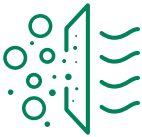
Air purification systems against viruses

There are many different types of air purification systems that say that they are “Effective” against airborne viruses. Comparing solutions can often be difficult. By choosing your air purification system from these 5 key criteria, you will be sure to have a system that suits your requirements.



Technology standards

Often clean air solutions will claim 99% effective. Ensure that there is a recognised Industry standard for this claim. Ensure that this standard involves the removal of the contaminant from the air stream and not static surfaces.



Filtration efficiency

Your filtration or particulate capture efficiency should be measurable per system. This means that your filtration system should be individually tested and certified for guaranteed performance.



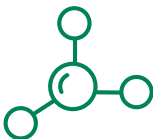
Clean air delivery rate

This is a key component for evaluating your air purification systems. How much clean air is going to be delivered into your area. The right clean air delivery rate will ensure your air purification system is sized right.



Monitoring

Availability of smart connectivity to air quality sensors is beneficial. Smart sensors can ensure air quality targets are being achieved as well as control energy consumption through reducing operational efficiency when air quality targets are met.



Gases

Your air purification system should not create air quality contamination risks such as ozone or other VOCs.

Features of Camfil air cleaners

Our air cleaners are designed for optimal performance even against the smallest particulates.

- ✓ 100% individually scan tested HEPA filters
- ✓ Low energy consumption
- ✓ Molecular filtration for odour removal
- ✓ Low noise level



Control, monitor and report

Have you achieved your Indoor air quality targets? Are you optimising the use of your air purification systems? Camfil's AirImage sensor and platform allows you to monitor, control and report on the air quality within your building. Showcase your buildings air quality to your customers, staff and stakeholders through display screen functionality.



Camfil – a global leader in air filters and clean air solutions

For more than half a century, Camfil has been helping people breathe cleaner air. As a leading manufacturer of premium clean air solutions, we provide commercial and industrial systems for air filtration and air pollution control that improve worker and equipment productivity, minimize energy use, and benefit human health and the environment. We firmly believe that the best solutions for our customers are the best solutions for our planet, too. That's why every step of the way – from design to delivery and across the product life cycle – we consider the impact of what we do on people and on the world around us. Through a fresh approach to problem-solving, innovative design, precise process control and a strong customer focus we aim to conserve more, use less and find better ways – so we can all breathe easier.

The Camfil Group is headquartered in Stockholm, Sweden, and has 30 manufacturing sites, six R&D centres, local sales offices in 30 countries, and about 4,800 employees and growing. We proudly serve and support customers in a wide variety of industries and in communities across the world. To discover how Camfil can help you to protect people, processes and the environment.

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