

How Camfil can help in reducing the risk of infectious virus in the indoor air using high efficiency air filtration



A research team comprising scientists from the United States, Canada and Spain reveals that more than [800 million viruses fall on every square metre](#) of the planetary boundary layer (the lowest part of the atmosphere) every day – the equivalent of 12 viruses for every person in the UK, 25 viruses per person in Canada. The risk of getting an infection through virus is high as unlike bacteria rain cannot wash them away.

A potentially devastating new disease has infected thousands of people since it was discovered in Wuhan, China in December last year. Chinese cities have been placed in lockdown in a bid to control the spread of the virus. This latest strain of the disease is particularly threatening because it causes pneumonia but will not respond to antibiotics. However, coronavirus (COVID-19) is by no means the only threat to human health.

This, of course, begs an important question – **what can you do to protect yourself** from these infections (not to mention other biological contaminants that pose health risks for building occupants such as smoke, mite, bacteria, house dust and pollen)?

Unlike with many other risks, we have no choice about breathing. But while most of us don't have the power to make the air cleaner, there are some things individuals can do to reduce the effect of these infectious particulates in the air.

HEPA filters can reduce the impact of the virus from the air

HEPA filters have been proven over decades across a wide range of healthcare facilities and life sciences applications, controlling the spread of airborne particles and organisms such as viruses and bacteria.

Indeed, many professional engineering organisations recommend HEPA (high-efficiency particulate air) filters in hospitals, infection control clinics and other healthcare facilities to eliminate microbes and other dangerous particles.

True [high-efficiency particulate air \(HEPA\) filters most commonly are rated by test methods that begin with a minimum capture efficiency](#). The efficiency of HEPA filters is measured at MPPS (most penetrating particle size) that means this is the lowest efficiency of the filter. For smaller or larger particles that filter will perform even better. MPPS is typically between 0,1-0,25 micrometer in size. Bacteria and viruses are often smaller than that but typically attach themselves to larger particles. It's also important to understand HEPA filters do not actively kill living organisms. They capture and hold them within the matrix of the filter.

High efficiency air filters can be installed in HVAC systems, filtering out biological pollutants and particulate matter carried by the airstream, preventing them from entering or recirculating back into the room. As unfiltered air flows through the HVAC unit's ductwork, the air filter captures and holds the airborne pollutants.

For further risk mitigation of airborne pathogens, it is recommended to upgrade or install the highest possible efficiency HEPA filtration (H13 or higher) in the existing ventilation system. This will improve your chances to avail an extra layer of protection against airborne pathogens.

What kind of solutions you need to reduce the risk of virus in the air?

Virus containment at health care facilities and biosafety labs is very much about control measures and precautions for airborne exposure. Measures include ventilation, pressure differentials, exhaust ventilation, air filtration and cleaning, ultraviolet and germicidal irradiation (UVGI) and even temperature and humidity control.

CONTROL HUMIDITY
High Humidity Leads to Loss of Infectious Influenza Virus from Simulated Coughs*
An indoor humidity level of between 40-60%RH has been scientifically proven to combat airborne flu infections. This ideal humidity level shortens the time airborne flu remains infectious.

AIR FILTRATION & CLEANING
Sealed windows and doors can cause stagnant, recycled air that can harbor airborne allergens, virus and bacteria. HEPA filters can remove the smallest microbes in the air, reducing harmful airborne germs that not only include cold and flu viruses but also dust, pollen, mold spores, pet dander and smoke particles.

ULTRAVIOLET & GERMICIDAL IRRADIATION
Germicidal type of UV lights are capable of inactivating microorganisms such as bacteria and viruses. Spread the UV light over the surface you wish to clean for the directed amount of time and the virus and bacteria will decrease substantially.

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COMBAT INFECTIONS IN THE AIR
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*Source: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0257485>

Air filtration solutions depend on the category of the risk when in application. High density areas with most affected surroundings such as laboratories, containment units, quarantined zones need much higher level of protection compare to low risk exposure surroundings or controlled areas like homes or small business space. High risk application needs air containment and filtration equipment of HEPA Class H13 or higher along with use of special personnel equipment and clothing, as well as a

segregated air supply, among other precautions.

Consider using air cleaners for fast and easy retrofit in case of sub-standard ventilation system for improvement in air filtration. It is also a way to rapidly boost the air quality of an already good functioning system when there is an increased risk that demands even better protection.

For crucial high-risk applications such as quarantined zones and laboratories Camfil provides compelling containment equipment. However, an air cleaner is recommended for use where the risk of airborne contamination is elevated. Both containment units and air cleaners cannot be installed anywhere as they are specific to the risk and nature of the surroundings, but an air cleaner can never replace a full containment set where there is a need. On the other hand, low risk applications can consider using EPA filters or ePM1 80% or higher category of air filtration.



“There are more than 60 biosafety laboratories classified as Level 4 (highest risk) by international commission in the world. Camfil has already delivered containment solutions for many of them in China, France, Switzerland, Germany and the U.S.A” - Anders Sundvik, Vice President Research & Development, Camfil

See the graphic below created by Camfil experts to understand air filtration and containment requirements on basis of its application.

WHAT KIND OF AIR FILTRATION YOU NEED?		
HIGH RISK APPLICATION high density area most affected laboratory, containment units, quarantined areas	MEDIUM RISK APPLICATION high risk of exposure high concentration of virus medical facilities, airport, public areas, schools, industries	LOW RISK APPLICATION low risk of exposure controlled area home, small office or business, personal use
HEPA + RELEVANT CONTAINMENT EQUIPMENT Class: H13 or higher	HEPA (recommended) or EPA Class: E12 or higher	EPA (recommended) or ePM1 (80%) or higher Class: E10 or higher
pass up 0.05% or 0.1 micron particles per liter of air	pass more than 0.5% of 0.1 micron particles per liter of air	captures particles <1 µm in size such as bacteria and viruses
efficiency: MPPS of 99.95%	efficiency: MPPS of 99.50%	efficiency: ePM1 95%

viruses, respirable dust, mites eggs and excretions, mold, allergens, pollen, bacteria, dust mites, cigarette smoke, asbestos, various toxic dusts and aerosols, dander



In order to educate and create awareness about role of air filtration and containment of airborne infections in order to reduce the risk indoors, Camfil has created a series of education based infographics that provides value-based insights in order to combat the virus in the air. Please find them here.

Camfil’s clean air solutions helps to reduce the potential spread of diseases through the air handling systems of biosafety labs and

hospitals. For more information about our range of HEPA, EPA and ULPA filters, visit www.camfil.com and reach the experts.

MPPS - most penetrating particle size

