



## CUSTOMER INFORMATION

viledon®

### TECHNICAL FILTER INFORMATION FOR PROTECTION AGAINST VIRUSES AND GERMS

The rapid global spread of the coronavirus, also known as COVID-19, has prompted the World Health Organization (WHO) to declare an international emergency. Such highly infectious viruses can be transmitted by droplet infection (through airborne aerosols), smear infection (through contact with surfaces such as door handles), or contact infection (through direct physical contact with an infected person).

In the case of transmission by droplets, very fine aerosols are generated – for example by sneezing – within which the individual airborne droplets are loaded with the pathogenic viruses. If these are inhaled, the person in question may become infected. These aerosols can, for example, be distributed in a building through a ventilation system and thus potentially endanger large numbers of people.

This risk can be reduced by suitable filtration measures in a building ventilation system and its correct operation.

#### Protection against aerosols contaminated with viruses and germs

Viruses have a size of about 100 nm, which corresponds to 0.1 µm. By way of illustration, this means that 10,000 viruses lined up next to each other would fit within a distance of one millimeter. However, viruses are typically unable to move independently through the air. Instead, they are generally attached to droplets or particles, the average size of which can exceed that of the viruses many times over. Such aerosols, which may contain adhering viruses and germs, can be separated by air filters to a certain percentage.

Air filter systems are therefore a good way of reducing the concentrations of airborne pathogens and thereby decreasing the risk of infection due to the inhalation of viruses and germs. The effectiveness of building ventilation systems varies according to their design. For example, for cleanrooms in the pharmaceutical industry (including the production of vaccines) or operating rooms in hospitals, Class H14 HEPA filters are used for removal of bacteria and viruses.



Only ventilation systems that are specially designed and approved for this specific purpose offer reliable protection when physically handling viruses. For example, these include microbiological safety cabinets approved by TÜV in accordance with EN 12469 (prescribed filter class H14 in accordance with EN 1822). Class H14 HEPA filters retain at least 99.995% of particles, bacteria and viruses with the size around 100 nm.

# INSTRUCTIONS FOR THE OPERATION OF VENTILATION AND AIR CONDITIONING (HVAC) SYSTEMS

Freudenberg Filtration Technologies makes the following recommendations for the operation of HVAC systems:

## Increase the proportion of fresh air

The proportion of fresh air should be increased as much as possible to prevent the spread of pathogens via the circulating air. It is generally unlikely that viruses will be sucked in via the outside air. Consequently, the amount of recirculated air should be reduced to the absolute minimum.

## Use fine filters for air recirculation systems

If it is not possible to eliminate air recirculation in the ventilation system, the recirculated air should ideally be filtered at least by means of high-efficiency fine filters (e.g. Viledon® MX98 at ISO ePM1 85% to ISO 16890).

In this context, the maximum possible fan pressure and the leakage rate in the duct system commonly found in standard ventilation systems must be taken into account (see EN 1886). The use of filter systems with higher filtration efficiency is likely to increase positive pressure in the air handler or duct and thus facilitate the escape of unfiltered air via leaks. Depending on the system, the actual leakage rate can vary considerably and must be checked in each individual case.

## Hygienic operation in HVAC systems

We recommend that the suggestions and recommendations of VDI 6022 for HVAC systems be observed. In particular, care should be taken to ensure that the filters do not show any signs of damage or leakage after installation. At this point, it is worth noting the importance of using dimensionally stable air filters (e.g. Viledon® compact pocket filters or Viledon® MaxiPleat filters), since dimensionally stable filters will retain particles already stored more securely and permanently. Insufficient stiffness of the filter pockets in pocket filters can result in the release of already embedded particles, especially during load changes. Recirculation filters should be replaced at the latest after the pandemic has subsided.

## Professional maintenance

Filter replacement should only be carried out by trained personnel using appropriate protective equipment. In addition, to minimize potential release of or exposure to pathogens, removed filters should be packed in airtight plastic bags and properly disposed.

If these recommendations are followed, the risk of pathogens spreading in a building can be minimized to the greatest possible extent by HVAC systems.

However, an HVAC system cannot reduce the immediate risk of infection, such as physical contact by shaking hands or droplet infection by a person sneezing in the immediate vicinity. For this reason, the recommendations made in this document can only be regarded as supplementary measures and in no way replace the personal hygiene and protection recommendations made by the WHO or national health authorities.



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