

It's not just in industrial environments that the benefits of air filters are becoming increasingly relevant – modern living spaces are turning to them, too.



# A medium with a future

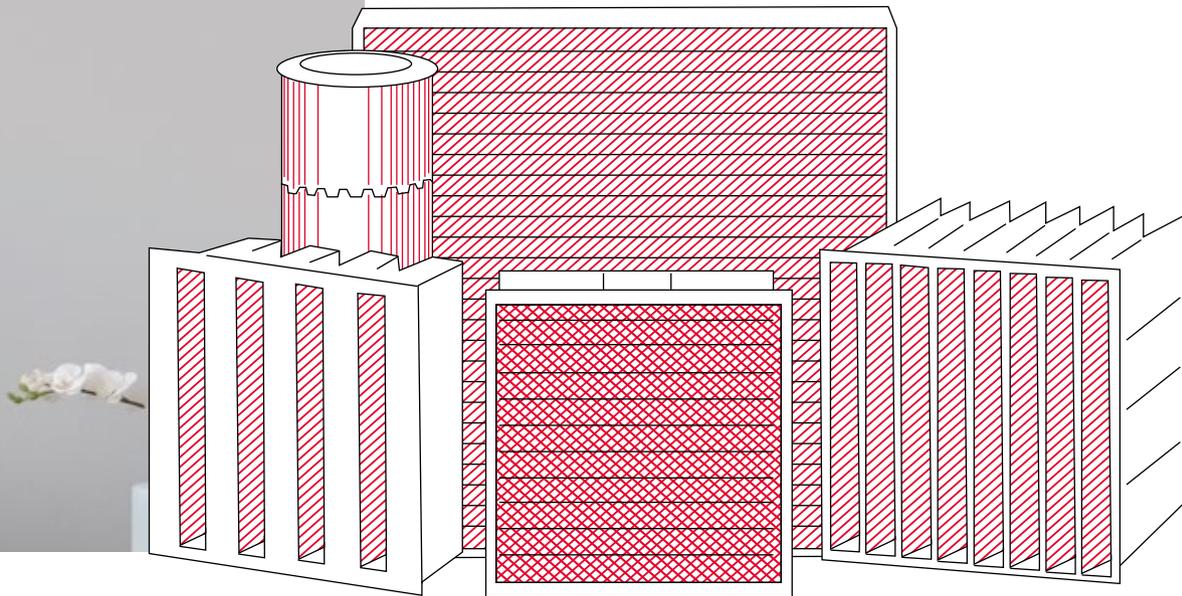
Filters for ventilation systems in residential buildings and industry are a frequently underestimated part of everyday life. But their impact should not be disregarded: they not only support the ongoing implementation of hygienic measures to contain the novel coronavirus, but they are generally of value whenever the aim is to make indoor air healthier for people. And while they may sound simple from the outside, the inside actually houses a complex structure.

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## »Effective ventilation systems with the right filter systems are perfect for reducing the viral load.«

Dr Thomas Caesar, Director of Global Filtration Technology, Freudenberg Filtration Technologies SE & Co. KG

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The market for filters and filter media is currently showing strong signs of growth. And it's not just modern residential buildings with high energy efficiency requirements that have a role to play here; the desire for reliable filtration solutions against the new coronavirus is also increasing demand. More and more products are appearing in the electrical trade sector, including for private use, which are supposed to rid the indoor air of harmful influences. There are a number of differences between the various models, too: while some manufacturers rely on simple filter media made of paper, other models from high-quality brands contain complex filter elements. These combination filters consist of materials such as activated charcoal medium and nanofleeces. In any case, the production of filters is an intricate affair – and the adhesive used has to fulfil a multitude of other tasks in addition to the bond.

Building filters for treating indoor air bind together minute particles such as fine dust, pollen or smoke particles. But pathogens such as bacteria or viruses can also be removed from the air with the help of filters, which is why building filters have become relevant for combating the novel coronavirus. Manufacturers such as Freudenberg Filtration Technologies offer filter media that can help to reduce the virus load in indoor air and thus minimise the risk of infection.

### A multi-layered medium

The HEPA filters used for the filtration of building air are known as depth filters. These are divided into the filter classes EPA (Efficient Particulate Air), HEPA (High-Efficiency Particulate Air) and ULPA (Ultra-Low Penetration Air). They keep indoor air clean and thus ensure healthy air in environments such as of-

fices and production halls. Synthetic materials like glass fibre fleece are used as the basis for depth filters. Additional lamination with further filter media may be required to achieve improved product properties such as higher stability or increased filtration efficiency. For optimum filter performance, ▶



Filter production is characterised by a high material input; in fact, several kilograms of adhesive can be processed in a single filter.

the largest possible surface area is needed in a small space, as Jowat product manager Michael Dressler explains: “The filter medium is pleated for this purpose and fixed with a hot melt adhesive. This maximises the filter area within the available space.” Adhesives such as Jowatherm® 262.30 based on ethylene vinyl acetate (EVA) are optimally adapted to the pleating process with a suitable open time as well as high initial strength. In addition, the hot melt adhesives are strong when cooled down, while also being flexible enough to allow for safe handling of the filter elements. For easy installation and replacement of the filter media in the ventilation systems, they are fitted with frames made of wood, metal or plastic.

### **Residential filters on the rise**

Modern buildings are increasingly being equipped with efficient thermal insulation. What brings many advantages from an energy point of view can cause problems with reduced air exchange in rooms: The risk of mould formation due to incorrect or insufficient ventilation, for example, is high. For this reason, new and renovated buildings are in-

creasingly being equipped with controlled living space ventilation (KWL), which supplies sufficient fresh air and makes manual shock ventilation redundant. Filters are installed in the ventilation systems to prevent exhaust fumes and pollen from outside from entering the room. These prove a worthwhile addition both in large cities and in the countryside. The filters used in KWL, however, are often the minimalist and less expensive version made of folded filter paper. The systems used in industry to clean exhaust and supply air, on the other hand, are much more complex.

### **Filtration of the highest quality**

In industry and especially in medicine, emissions and contaminants in the breathing air have to be continuously extracted to maintain high hygienic standards and ensure occupational safety. This doesn't just apply to the production of medical products or electronic items where cleanliness determines the quality of the end product: reliable filtration of the room air also has a major impact in laboratories and operating theatres. Aerosols from the air containing particles of fungi, bacteria, viruses, pollen or airborne dust are

## **What does ‘pleating’ mean?**

**i** Pleating refers to the folding of a filter medium – often fabric or paper. The aim is to create the largest possible surface area of the medium in a small space. The use of adhesives allows the folds to hold their shape.

removed to maintain the clinical cleanliness of the premises. Standardised cleanrooms use HEPA particulate air filters to remove particles smaller than one micrometre in diameter. In the manufacture of HEPA filters, most of the subsequent total weight of the building filters comes from the adhesive used. “A large filter element can easily contain up to six kilograms of adhesive,” explains Michael Dressler. It is therefore not unusual for a filter manufacturer to get through several tonnes of adhesive each year in the production of HEPA filters. Michael Dressler shares the assessment that filter production will become even more relevant in the future. After all, building filters not only contribute to energy-efficient living, but also to occupational and hygiene safety. Jowat is currently focusing its own research and development in this area more than ever before. “Close and cooperative contact with our customers is what allows us to consistently develop our innovative adhesives further in line with the latest market requirements and needs.” ●



Filters with these dimensions are primarily used for industrial exhaust air filtration.