



**Many years of designing and manufacturing fume extraction and filtration systems for a variety of industries has given BOFA the experience and knowledge to help ensure that our products are the best available on the market.**

Our understanding of industrial processes and applications is reflected in the design and manufacturing procedures applied to our range of standard, inline and patented filters.

Our unique filtration systems are designed to meet or exceed airborne emissions standards and optimise productivity while lowering the overall cost of ownership.

Our combination of pre-filtration systems and high efficiency particle filters enables us to remove 99.995% of particles 0.3 micron in size. This ensures that clean air is maintained in the workplace, while patented innovations such as DeepPleat DUO coupled with reverse flow air technology, optimise filter lifetime and lower the overall cost of ownership.

### Pre-filters



#### Panel pre-filters

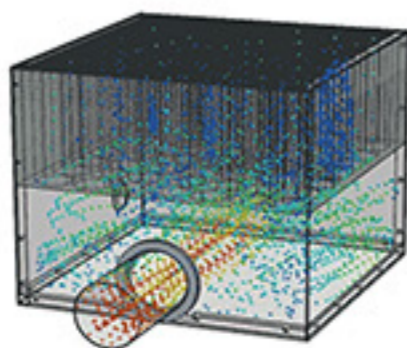
The efficiency of the pre-filter is directly related to the life of the HEPA in that the more particulates captured in it, the less can pass through and prematurely block the HEPA. Most pre-filters have an efficiency grading of F5 - F7. When plastics are being lasered, the particulate size generated is typically 0.2microns. At this level of filtration the media has an efficiency of 35% in F5 to 65% in F7. When metals are being lasered the particulate size being generated is typically below 1micron. This equates to an efficiency of 65% in F5 to 80% in F7.

The BOFA range of fume purification systems have an F8 grade media which gives an efficiency of 80% at 0.2 microns and 95% at 1micron.



#### Bag filters

Bag filters are occasionally used in laser fume elimination for their volumetric containment properties. These bags have a variety of shapes including multi pocket styles to increase surface area and reduce pressure drops.



#### DeepPleat DUO pre-filters

Save filter life and money with our unique pre-filter

Our unique patent-protected DeepPleat DUO concept is designed around reverse flow operation to maximise filter life. As the contaminated air enters the filter chamber the velocity is dramatically reduced, allowing the larger particulates to fall to the bottom and therefore clear of the filter media. The smaller, lighter particulate are then retained within the filter pleats. This allows a greater majority of the larger particulate to fall away from the filter surface and into the drop-out chamber within the filter enclosure giving a far greater efficiency and much longer life for the full filter area.

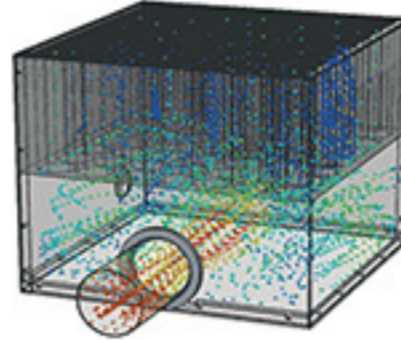


The unique product features of the DeepPleat DUO filters ensure that particulate capture is optimised and that the life of the main filter is extended and the overall cost of ownership reduced.

Take a look at our dynamic animation, which explains exactly why the BOFA DeepPleat DUO is the longest lasting pre-filter available on the market as well as extending the life of your main filter reducing overall cost of ownership.

The BOFA DeepPleat DUO pre-filter incorporates a massive drop-out chamber within the filter. Above this chamber but still within the housing there is a sealed deep pleat layer of F8 media giving a surface area in excess of 6/12/30 sq metres.

The DeepPleat DUO is available in three different sizes, offering different chamber sizes and surface media areas, as shown below:



<p><b>AD Nano (+)</b> Inlet size 50mm</p> <p><b>Dropout chamber size</b> 7.44 litres</p> <p><b>Surface media area</b> 6m<sup>2</sup></p> <p><b>Filter media pleat size</b> 150mm</p>	<p><b>AD Oracle iQ</b> Inlet size 75mm</p> <p><b>Dropout chamber size</b> 16.2 litres</p> <p><b>Surface media area</b> 12m<sup>2</sup></p> <p><b>Filter media pleat size</b> 200mm</p>	<p><b>AD 500/1000/1500 IQ</b> Inlet size 125mm</p> <p><b>Dropout chamber size</b> 58 litres</p> <p><b>Surface media area</b> 30m<sup>2</sup></p> <p><b>Filter media pleat size</b> 200mm</p>
<p><b>AD 2000 iQ</b> Inlet size 125mm</p> <p><b>Dropout chamber size</b> 58 litres x2 (116)</p> <p><b>Surface media area</b> 30m<sup>2</sup> x2 (60m<sup>2</sup>)</p> <p><b>Filter media pleat size</b> 200mm x2 (400mm)</p>	<p><b>AD 4000 iQ</b> Inlet size 125mm</p> <p><b>Dropout chamber size</b> 58 litres x3 (174)</p> <p><b>Surface media area</b> 30m<sup>2</sup> x3 (90m<sup>2</sup>)</p> <p><b>Filter media pleat size</b> 200mm x3 (600mm)</p>	



A specially moulded grommet style gasket situated within the drop-out chamber makes it easy and safe for operators to undertake the initial installation and replacement of used filters. This safety aspect of the design is an important feature bearing in mind the different and in many cases, harmful contaminants found within a used filter.

As the contaminated air enters the inside of the cartridge chamber, the velocity drops slowing down the airflow causing in the larger and heavier particulates to fall within the cartridge sump. The sump also allows larger particulates that build up during operation to drop away from the filter through the true nature of reverse airflow design.



## HEPA Filters



The mini pleats used in our HEPA filter can be produced with depths of up to 200mm within each pleat, depending on the application.

They are generally manufactured by specialist filter companies to ensure that the latest manufacturing and test methods are adopted. Each filter incorporates a series of webbing between the pleats. This feature not only guarantees even spacing for full filter coverage between each pleat, but also alleviates the possibility of airflow vibration or collapse

BOFA HEPA filters are tested to filter 99.997% @ 0.3 microns.



### What is a HEPA filter?

HEPA stands for high-efficiency particulate air. HEPA filters provide a very high level of filtration for the smallest, as well as the largest, particulate contaminants. They send air through various pre-filters to assist with catching airborne particulate, capturing 99.997% of particles at 0.3 microns. Even when particles are smaller than this, they get captured by diffusion, meaning HEPA filters are extremely effective at capturing nanoparticles.

### The significance of 0.3 microns

0.3 microns is the established Most Penetrating Particle Size (MPPS) and therefore the filtering efficiency increases for particle sizes larger AND smaller than this. A HEPA filter's removal efficiency increases as particle size decrease below 0.3 microns. Although this sounds counterintuitive, it is a proven and accepted fact in the filtration sciences, examined in the following four filtration mechanisms.

### Filtration mechanisms

There are four basic ways media captures particles:

#### INERTIAL IMPACTION

Inertia works on large, heavy particles suspended in the flow stream. These particles are heavier than the fluid surrounding them. As the fluid changes direction to enter the fibre space, the particle continues in a straight line and collides with the media fibres where it is trapped and held.

#### INTERCEPTION

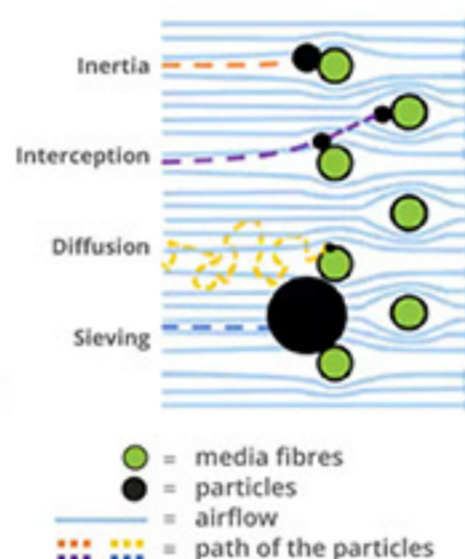
Direct interception works on particles in the mid-range size that are not quite large enough to have inertia and not small enough to diffuse within the flow stream. These mid-sized particles follow the flow stream as it bends through the fibre spaces. Particles are intercepted or captured when they touch a fibre.

#### DIFFUSION

Diffusion works on the smallest particles. Small particles are not held in place by the viscous fluid (air) and diffuse within the flow stream. This means that the smaller a particle is, the more likely it is to traverse the flow stream, making it more likely to collide with the fibre and be collected.

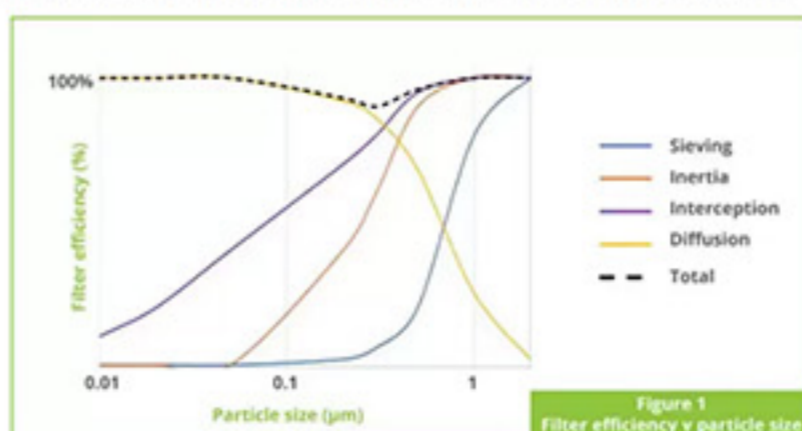
#### SIEVING

Sieving, the most common mechanism in filtration, occurs when the particle is too large to fit between the fibre spaces.



### The principles behind filtration

The filter efficiency chart below (Figure 1) represents a filter that is approximately 90% efficient against a range of particle sizes. A HEPA filter would follow the same filtration principles but would have a total filtration efficiency greater than 99.97%. In other words, the worst that a HEPA filter would perform would be to capture 99.97% of particles.

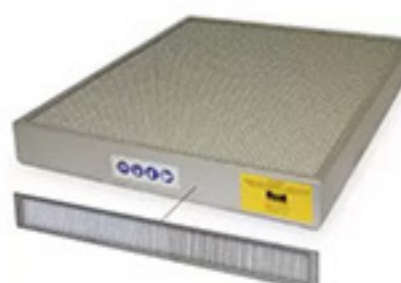


### HEPA filters in BOFA extractors

BOFA extraction systems use HEPA filters rated to remove 99.997% of particles at 0.3 microns (0.0003 mm).

The mini pleats used in our HEPA filters can be produced with depths of up to 200mm within each pleat, depending on the application.

They are manufactured to ensure the latest manufacturing and test methods are adopted. Each filter is pleated with glue bead spacers. This feature not only guarantees even spacing for full filter coverage between each pleat but also alleviates the possibility of airflow vibration or collapse.



## Chemical and Gas Filters



Contaminated air must remain in contact with the carbon bed for a period of time sufficient to ensure that no contaminants or odours are emitted ('dwell time'). Our product designs consider the balance between air flow rates and the type, depth and surface area of the carbon used to ensure suitability for the contaminants associated with the application and to ensure that appropriate dwell times are achieved.

Our filters have been developed to capture all contaminants and odours, eliminating the risk of bypass and/or tunnelling.



Siden starten i 1985 har Alvoen AS levert over 3400 CNC fresanlegg, graveringsmaskiner og lasersystemer til kunder innen skiltbransjen, trebransjen samt generell industri.

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