Revo II

The Next Stage in the Air Filter Revolution

CLEAN AIR

POWER GENERATION

CLEAN ROOM

INDUSTRIAL

Just as the first incarnation revolutionised filter design, Revo II pushes the boundaries of filter technology even further. With a state-of-the-art synthetic media incorporating nano fibres, Revo II provides a remarkable dust holding capacity and life, whilst maintaining a low pressure drop.

By changing over from conventional air-conditioning filters to Revo II, you will lower your energy consumption by thousands of kWh and at the same time, significantly reduce your CO_2 emissions.

Good for the environment and your budget.

KEY FACTS

- Meets the requirements of EN 779:2012: Provides validated performance
- High energy efficiency: For low cost and environmentally-friendly operation
- Nanofyne+™ media: Maximum efficiency with minimal pressure drop
- Specially designed polypropylene frame: Guarantees the seal between filter media and frame
- Extended filter surface and high dust holding capacity: Provides up to double the service life and lowers life-cycle costs
- Recyclable or fully incinerable: Easy, environmentally-friendly disposal
- Stiff frame and durable filter media: Simplifies filter replacement
- Stiff, welded pockets: Ensure an air-tight seal and eliminate particle loss from air flow variations
- Mechanically bound fibres: Prevent shedding and provide resistance to humidity and potentially harmful chemicals
- Aerodynamic design: Reduces pressure drop, saves energy and contributes to low life-cycle costs

EUROVENT CERTIFIED PERFORMANCE
AIR FILTERS CLASS M5-F9
www.eurovent-certification.com

MANN+HUMMEL participates in the ECC programme for Air Filters. Check ongoing validity of certificate: **www.eurovent-certification.com or www.certiflash.com**

Revo II
More Performance

Whilst Revo II retains many of the features that made the first incarnation such a success, the most notable bene t over the previous model is the additional service life. Thanks to a unique filter media, Revo II provides up to double the operating life than the previous model, which already boasted excellent longevity itself.

This additional life is not at the expense of performance, however – efficiency levels are improved for all filtration grades, in fact. And, with both initial and minimum test efficiencies also enhanced, Revo II comfortably meets the requirements of EN 779:2012.

With this added performance and life comes a two-fold benefit to filter spend. Obviously, a longer life reduces the outlay required for primary filters, but Revo II also eliminates the need for a separate prefilter too, further lessening filter spend. In addition, the removal of a prefilter stage immediately improves the pressure drop of the system, reducing energy consumption even further.

Stiff, welded pockets

Pocket separators improve air flow

Multi-layered, synthetic media

Robust and rigid polypropylene frame

Aerodynamic inlet with tapered pockets

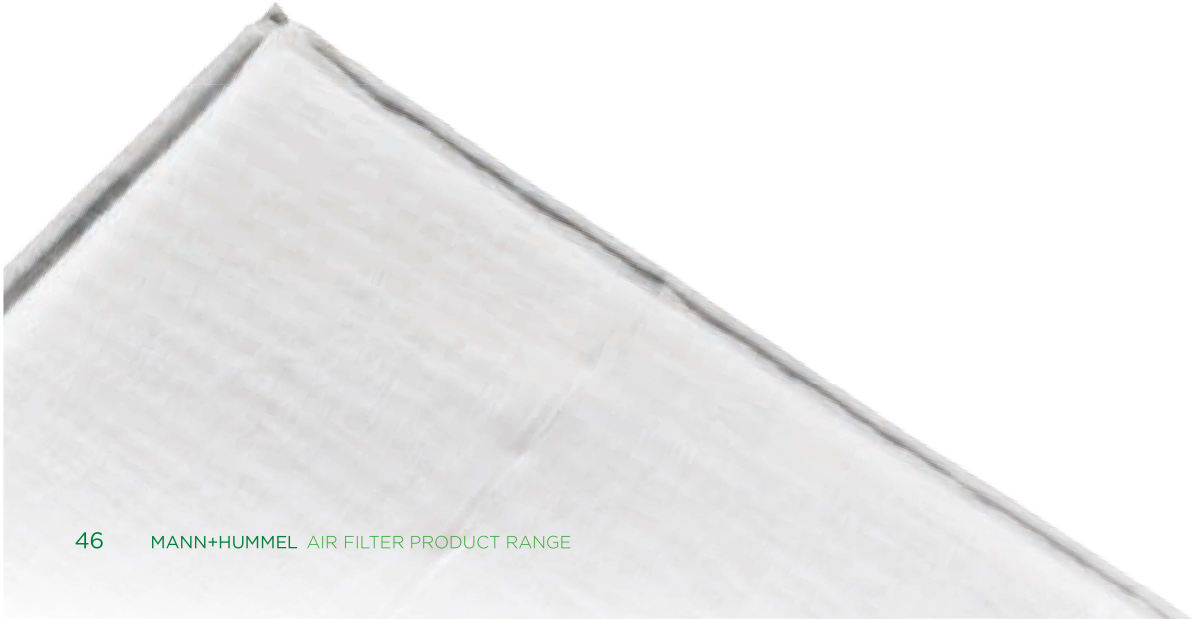
Revo II
Progressive Filter Media

Revo II is constructed from several layers of media to provide progressive filtration for different particle sizes. The first layer has a coarse structure and filters the largest of particles. The second, Nanofyne+™ layer, removes the smallest of particles. Whilst the outer layer comprises of a stiff composite material that also gives the media its rigidity. This multi-layered solution allows contaminant to be depth loaded into the media, increasing dust holding capacity and prolonging life.

LAYER 1
Pre-filter with a coarse structure to remove the largest particles

LAYER 2 (F7–F9)
Secondary fine filter with Nanofyne+™ removes the smallest particles

LAYER 3
Supports the second layer, ensuring the media retains its form during air flow variations and performs as expected



Revo II Nanofibres

We first introduced nano fibres to the filtration marketplace in 2006 through our Nanofyne Technology™ line. Since then, it has been widely adopted and established at the forefront of filter technology. Revo II is the first product to feature the latest nanofibre media – Nanofyne+.

With a diameter of less than 1 µm, nanofibres provide reduced pressure drop without compromising filtration efficiency, giving you better performance than old-fashioned glass fibre.

When we combine the characteristics of Nanofyne+ with the electrostatic charge of synthetic media, we get a filter with unique performance – high efficiency from the start and low pressure drop, which reduces the energy consumption of the fan.

ENERGY EFFICIENCY

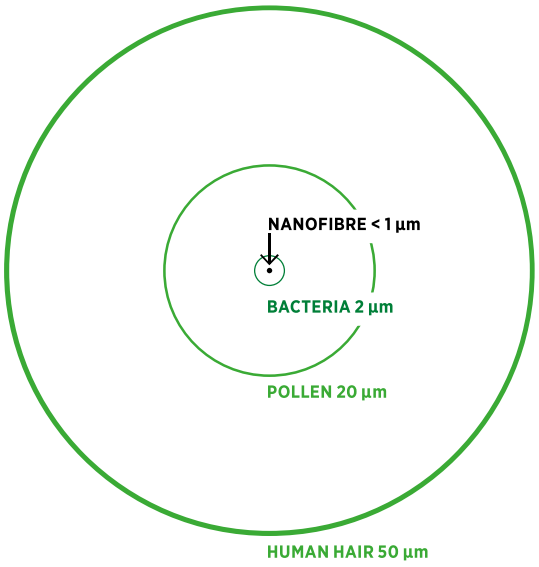
A filter consumes energy by creating a resistance to the air that flows through it. This pressure drop means that the ventilation fan has to work harder to move the air. The effort required is directly related to the energy consumed by the fan motor. Put simply, if the pressure drop over the filter is lowered, the fan works less hard and therefore consumes less energy.

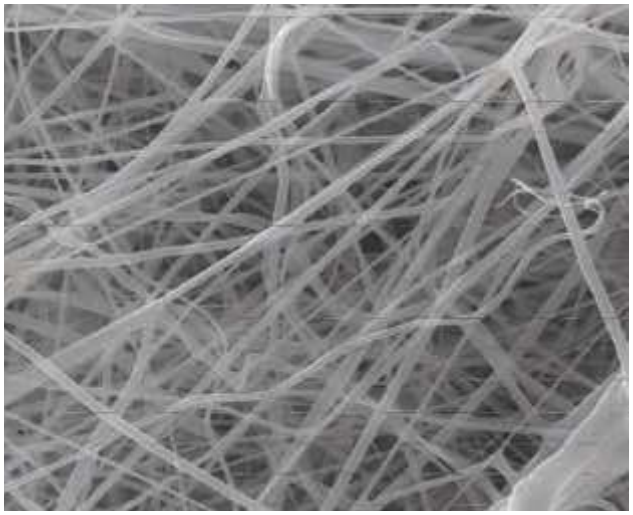
As a rule, the higher the filter efficiency, the higher the pressure drop, but the other aspects of a filter design are crucial in determining the pressure drop relative to comparable filters. That's why the Revo II with its multitude of energy saving-features has the lowest pressure drop available.

In fact, tests have shown that fitting an air handling unit with Revo II typically reduces the pressure drop of the entire system by more than 20%.

INCREASED AIR FLOW

Alternatively, in environments requiring greater quantities of delivered air or those with direct-drive fans, the lower pressure drop a orded by Revo II can provide a dramatic increase in air flow. In such situations, installing Revo II effectively upgrades an air delivery system without the expense of retrofitting new air handling units.





Revo II filter media photographed with an electron microscope at 2,500 times magnification

Revo II
Lowering your Operating Costs!

LIFE-CYCLE COST (LCC)

An LCC-analysis of air filters shows that approximately 80% of the costs*) are a result of the pressure drop across the filter. The purchase price does not represent such a large proportion of the total cost as many think, typically equalling just 20%.

In order to give our customers the best possible value, the focus of our development work on Revo II has been concentrated upon lowering life-cycle costs. This has given us a filter with a high dust holding capacity and low pressure drop.

Revo II can lower your operational costs considerably.

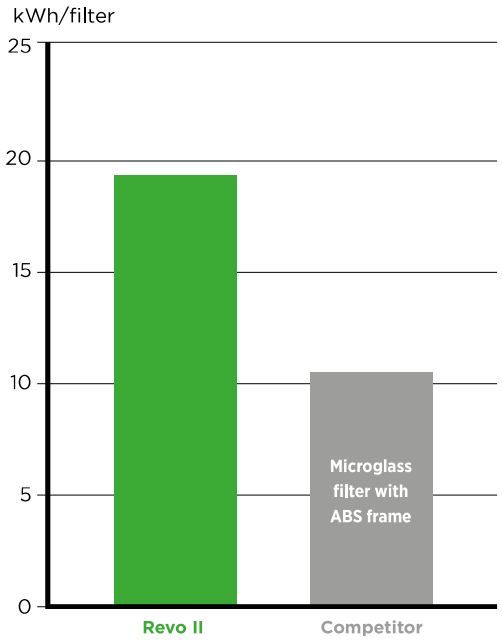
We would be delighted to help you calculate how much you can save by changing to Revo II!

ENERGY CONTENT WITH COMBUSTION

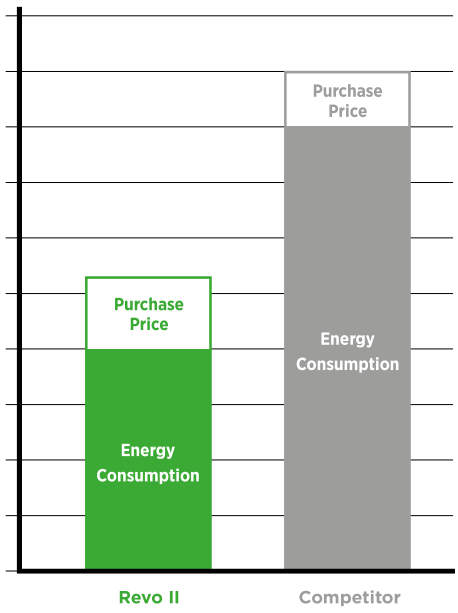
Synthetic filters with plastic frames are a highly appreciated combustible waste product for wastepowered incineration plants. This is due to the high energy value emitted when the product is burned and the small amount of ash left after combustion.

When one burns a new Revo II the energy emitted corresponds to 90% of the energy created from burning the same amount of heating oil.

RECOVERED ENERGY WITH COMBUSTION



*) FILTER CLASS F7



Revo II
The Key to a Long Life – Dust Holding Capacity

Awareness is growing of the environmental benefits that air filters can provide. As manufacturers, we are constantly striving to lower the pressure drop of our products to reduce their energy consumption. We use environmentally-friendly materials such as synthetic filter media to reduce their negative impact during production and disposal, choosing incinerable materials so that energy can be reclaimed once they have served their purpose.

But one of the most effective ways to enhance an air filters impact upon the environment is to simply lengthen how long it can be used for in the first place.

Using less material, less energy to produce, deliver and install, and less to throw away. Obviously, this also reduces the life cycle cost of the product too, saving our customers money in the process.

This is the core premise for Revo II. A revolutionary media construction provides all the efficiency you would expect but with an extremely high dust holding capacity. So high in fact, that it is possible to reduce the number of pockets required and still achieve the same dust holding capacity as many competitive products, thus lowering the pressure drop in the process.

This additional capacity is achieved through a unique media design that provides more filter media per module. Not only does this yield a service life up twice that of the previous Revo, but e ciency is improved too – increasing for all particle sizes, in fact. For example, initial efficiency, which is now independently verified by Eurovent, is over 65 % at 0.4 µm for an F7 filter.

AIR QUALITY

It is now widely accepted that we are living in an evermore polluted world, breathing air containing ever higher levels of contaminant. A UK government study found that reducing the concentration of $PM_{2.5}$ would be more beneficial to life expectancy than eliminating passive smoking and traffic accidents combined. With this in mind, the importance of choosing the correct level of filtration is clear. However, as a general rule, energy consumption increases proportionally to filter class. So whilst simply increasing the filtration efficiency will improve the air quality, it will do so at an increased energy cost – both financial and environmental.

So what is required is a solution that provides sufficient air quality at the lowest possible energy consumption.

But, given the disparate PM concentrations present in the World's air, there is unfortunately no 'catch-all' solution for the correct filtration level. Instead, a more tailored approach must be employed.

PM Particulate matter

PM_{10} Particles smaller than 10 µm in diameter

$PM_{2.5}$ Particles smaller than 2.5 µm in diameter

PM_1 Particles smaller than 1 µm in diameter

ECO16 – CLEAN AIR MANAGEMENT SYSTEM

This balance is exactly what our patented Eco16 system seeks to find. A clean air management system, Eco16 guarantees a required level of air cleanliness in the most efficient manner possible. By analysing your exact requirements and operating environment, we balance all of the constituent parts of your air handling unit and provide you with a filtration system that offers the necessary cleanliness at the lowest possible cost – both to you and the environment.

eco16

Thanks to its low pressure drop and high efficiency levels, Revo II is an integral tool in the Eco16 system. It is for this reason that we have included the expected PM removal efficiencies in the technical data overleaf. For further information on the Eco16 clean air management system, please contact your local MANN+HUMMEL representative.

Revo II
Technical Data

Filter class (EN 779)*	No. of pockets	eco16 – PM Removal**			Initial Service Efficiency*	Minimum Test Efficiency*	Nominal air flow		Pressure Drop Clean Filter (Pa)*	Energy Rating***
		PM_{10}	$PM_{2.5}$	PM_1			m^3/h	m^3/s		
M5	4	30%	5%	<5%		–	3,400	0.94	33	A+
M6	5	60%	35%	30%		–	3,400	0.94	50	B
F7	8	85%	60%	50%	55%	45%	3,400	0.94	70	B
F7	10	85%	60%	50%	55%	45%	3,400	0.94	70	A
F8	8	95%	80%	75%	75%	70%	3,400	0.94	100	B
F9	8	95%	90%	85%	90%	80%	3,400	0.94	135	B

Notes:
Revo II is manufactured in a number of sizes and variants. The data above applies to the most usual standard sizes. Dimensions: 592 x 592 x 635 mm
The different energy ratings for the F7 class are caused by a higher dust holding capacity on the 10 pocket version.
* Values certified by Eurovent
** Calculated according to ISO/FDIS 16890-1 – values should only be used as an indication. Onsite survey required to obtain an exact measurement.
*** Energy Rating – as is the case with many consumer goods, our M5 – F9 filters are rated according to their energy e ciency on a scale of A+ (the best) to E (the worst). These ratings are certified by Eurovent and in accordance with the 4/21 scheme.

Maximum Operating Temperature	70 °C
Maximum Relative Humidity	100%
Recommended Final Pressure Drop	2 – 2.5 times initial pressure drop

Revo II
Pressure Drop / Airflow

Revo II is manufactured in filter classes M5 – F9. The diagrams show the pressure drop with a clean filter and 1/1-module (635 mm)