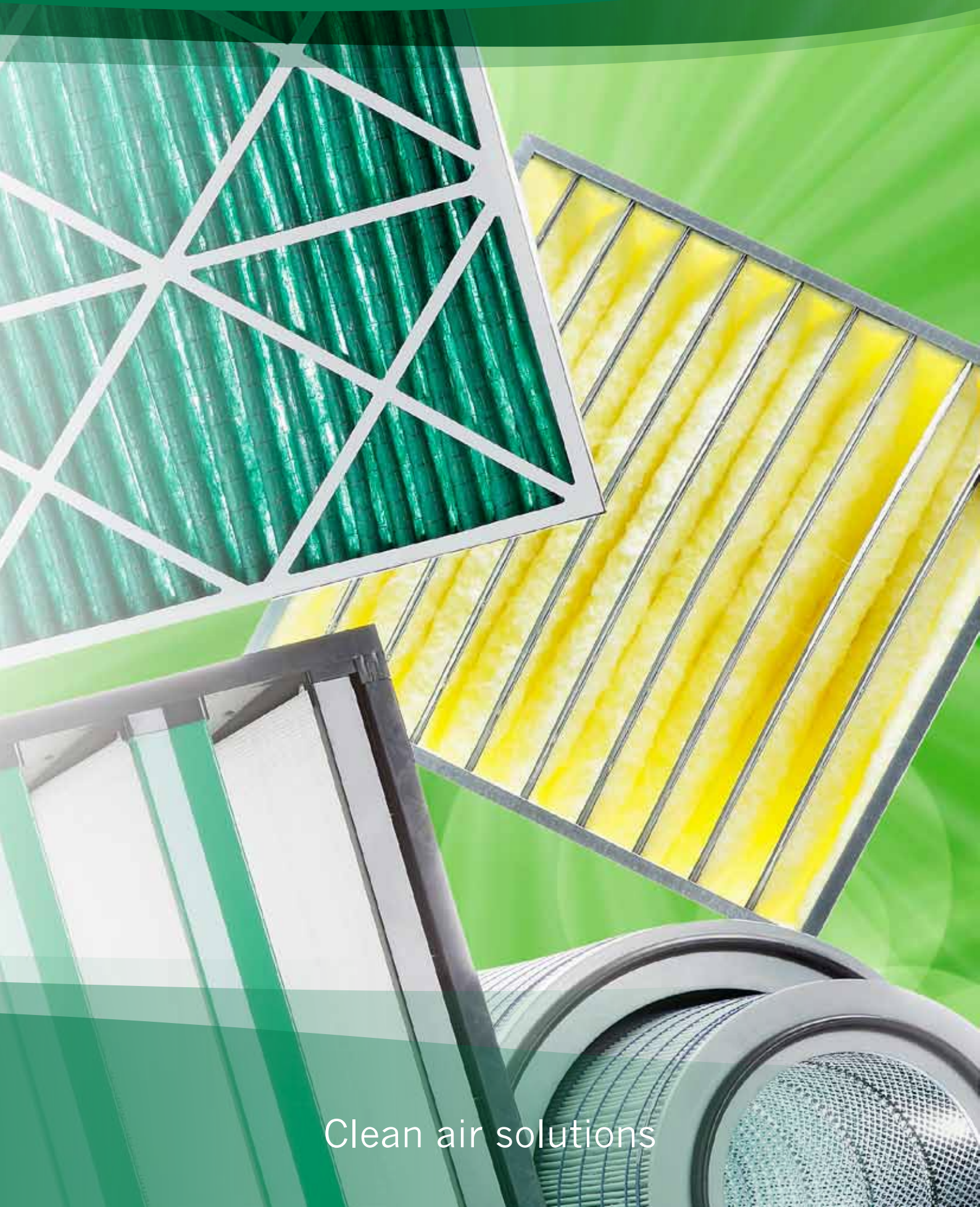




Product catalogue 2014



Clean air solutions



Camfil - Ipoh, Malaysia plant.



Camfil - Kunshan, China plant.

Dear Customer:

We are happy to provide this latest edition of the Camfil Product Catalogue.

We've tried to make it easy to use and have included extensive product information, application guides and reference tools to simplify the selection of the right Camfil Clean Air Solution. This catalogue along with additional application specific information is also available for download as an application or can be accessed via our online version (see page 20).

Camfil is a Clean Air Solution provider to the world, our product range includes many industry benchmark filters. Already a market leader in Europe and North America, growing Camfil investments have made us the fastest growing Clean Air Solution provider in Asia Pacific. Building on our strength of in-house process development, continuous product R&D and global purchasing power Camfil operates multiple factories and an extensive sales network dedicated to the support of our valued customers in Asia Pacific and the Middle East. We have also developed a wide range of technical support tools including software packages that can assist in Life Cycle Cost evaluation, Clean Room design, Filter Performance Data and Chemical Filter Selection.

We are also proud to be helping our customers become more environmentally friendly. Our R&D efforts are focused on developing sustainable solutions that take into account complete product life cycles. For a customer using high performance Camfil products this translates into reduced energy consumption and lower operating costs. This is good for our customers and for the planet.

If you would like more information about any of these programs, please contact your local Camfil Sales Office or Distributor.

Alternatively, you can visit our website at www.camfil.com.

We are pleased to offer this wide range of Clean Air Solutions, please enjoy your reading.

Lars Kristensen
VP Sales Asia



ALL HEPA/ULPA filters are individually tested according to EN 1822



Production in controlled environment



All plants are ISO 9000 certified



Advanced molecular filter production



Index

Pre-Filtration, Class G3 to M5

Media Rolls - Filter class G3 to M5	46
Cam Glass Media	47
Fan Coil Filter	48
Media Holding Frame (MHF)	49
AeroPleat® III	50
30/30®	51
AP Eleven	52
30/30® WR	53
Hi-Cap®	54
Hi-Cap® XLS	55
ECO®Moisture Separator	56

Bag and Compact Filters, Class M5 to F9

Hi-Flo XLT	58
Hi-Flo® M-Series	59
Hi-Flo® P-Series	60
Hi-Flo® U-Series	61
Hi-Flo® A-Series	62
Hi-Flo® T-Series	63
S-Flo P Series	64
S-Flo U Series	65
S-Flo A Series	66
Opakfil Start	67
Opakfil Green	68
Opakfil CC	69
Durafil® ES	70
Durafil® ESB	71
OpakAir	72
Airopac® 3GGM	73
Airopac® 3GGMHF	74
EcoPleat Green	75
Airopac® Green	76
Riga-Flo	77
Riga-Flo P	78
3CPM Aeropac	79
3HCP8 Aeropac	80

EPA / HEPA / ULPA Filters, Class E10 to U17

Absolute™ CE - E11, H13	82
Absolute™ CM - E11, H13	83
Absolute™ DE - H13, H14	84
Absolute™ DG - H13, H14	85
Absolute™ VE XL, XXL - E11, H13, H14	86
Absolute™ VG XL, XXL - E11, H13, H14	87
Absolute™ VG HF - E10, H13	88
Megalam MD, MX, MG	89
Megalam MD - H13 to U15	92
Megalam MX - H14 to U15	93
Megalam MG - H14 to U15	94
Megalam (Laminator) MDL,MXL,MGL-H14 to U15	95
Silent Hood HD - H13 to U15	96
Silent Hood HL - H13 to U15	98











Molecular Filtration

CityPleat	105
City-Flo	106
CityCarb®	107
CitySorb	108
Riga-Carb	109
CamSure	111
CamCarb Green	113
CamCarb Metal	114
CamCarb Mounting Frames (Baseplates)	115
CamPure® GDM Green Disposable Modules	116
Gigapleat XPC/XPH	117
Gigapleat NXPP	118
Gigapleat NXPH	119
Gigapleat NXPC	120

Frames, Housings and Speciality Filters

PHAP® Pharmaseal AP	124
Pharmaseal Exhaust AP	126
Slimline RSR	127
CamSafe 2: Safe change filter casing (BIBO)	128
CamBox	129
CamContain	130
CamCube HF, filter housings for bag filters	131
FCBS-A	133
FCBL-CC	134
Absolute Filter Holding Frame	135
Universal Holding Frames	136
Termikfil 2000	137
Absolute® 1FRK	138
Absolute® 1FRSI	139
Sofilair HT 120 - H13	140
Airopac® HT-HF	141
30/30 GT	142
30/30® WR	143
CamClose Compact	144
CamClose G4 - M6	145
Hi-Cap® GT	146
Cam-Flo XMGT	147
Cam-Flo XLGT	148
Cam GT® Green	149
Cam GT® Box Type Green II	150
CamGT 4V-300	151
CamGT 3V-600	152
Campulse GTC	153
Campulse GTD	154
CamPulse GT Polytech HE	155
Tenkay GTC/GTD/PolyTech HE	156
CamCleaner 300	157
CamCleaner 300 Concealed	158
CamCleaner 800	159
CamCleaner 2000	160
CamCleaner 6000	161
CamCleaner CITY	164
Dynavane	165
Gold Series®	166
Gold Series® Camtain	168
Zephyr III Portables	169
HemiPleat® Gold Cone®	170
HemiPleat® Retrofit	171

Quick Selection Guide

		Filter Grade		Air Filter Selection					
Primary Filtration	Medium Efficiency	Primary	ASHRAE 52.2 - 2007	MERV 2 - 4 MERV 5 - 6 MERV 7 - 9	EN 779:2012	Primary Filters			
						G2 ≥ 65% G3 ≥ 80% G4 ≥ 90% EN 779:2012 Average Arrestance			
Filtration for Air Conditioning Systems. Pre-Filtration for EPA/HEPA/ULPA Filters	High Efficiency	Medium	ASHRAE 52.2 - 2007	MERV 10 MERV 11 - 12	EN 779:2012	Fine Filters			
		Fine				M5 ≥ 40% M6 ≥ 60% F7 ≥ 80% F8 ≥ 90% F9 ≥ 95% EN 779:2012 Average Efficiency			
Final Filters/ Clean Room Filters Class according to Fed. Std 209 E 	Very High Efficiency	EPA	DOP 0,3 um	≥ 95% ≥ 99,9% ≥ 99,97%	EN 1822:2009	MPPS (Most Penetrating Particle Size)			
						HEPA	≥ 99,99% ≥ 99,999%	E10 ≥ 85% E11 ≥ 95% E12 ≥ 99,5% H13 ≥ 99,95% H14 ≥ 99,995% U15 ≥ 99,9995% U16 ≥ 99,99995% U17 ≥ 99,999995%	
Molecular		ULPA		CityFlo, CitySorb, CityCarb, Camcarb		   			
Filter Holding Frames and Casings						    			
						Filter Housings, Camseal, FC Casings, Type 8 Frames etc.			

Camfil Academy:

Become the air filtration specialist in your company

In addition to providing up to date air filtration solutions Camfil can provide a structured training program covering all aspects of air filtration engineering. Adapted to suit your needs the training includes information on how to specify and select air filters, air filter standards, indoor air quality legislation, air filter application, and reducing energy and environmental impact.



Camfil On-Site Expertise:

Camfil Filter Management

Camfil has a fresh approach to managing on-site air filtration services. We understand that filtration is required for protecting people's health, ensuring legislative compliance and protecting valuable investments. We have our own site service team that can manage all aspects of your air filter requirements by offering a wholly inclusive service package.



Ensuring safe and efficient running of effective air filtration systems demands a multi-disciplined service solution. These extend beyond comprehensive logistics to ensuring that filters are fitted correctly, working efficiently, and optimised to reduce the overall cost of ownership for the lifetime of the installation.



In order to comply with current legislation and reduce cost of ownership of some installations, upgrading work is required. Camfil can provide a joined up solution which includes selection, supply, fitting, commissioning and validation of any new or upgraded installations.

Filter installation upgrade service

Before



After



Air filter system validation service



By fitting energy efficient filters and maintaining ventilation systems real energy savings can be made quickly. Maintained correctly these will translate into long lasting real reductions in cost and environmental impact. Camfil can provide a comprehensive package of air hygiene services that will ensure your systems are healthy, legislation compliant, and cost effective.



Performance Managed Supply

Camfil complete the "cradle to grave" responsibility for all your filtration needs by providing a unique logistics system at the centre of which is a national transport fleet. This dedicated fleet of vehicles with trained employees ensures that you get your goods when and where you need them. To complete the service, we can remove and dispose of used filters together with providing all of the required certification.



On-Site testing/Troubleshooting

We have a wide range of test equipment for On-Site measurements including particle counters, pressure gauges, airflow meters, energy data loggers, corrosion monitors and gas analysis equipment. Combined with the expertise of our engineers we are able to help you troubleshoot and improve your ventilation system.

Air Filter Laboratory Testing

Camfil Malaysia Test Facility

Camfil operates air filter testing laboratories in many of our R&D facilities around the world, all having a goal of developing technology for improved air quality for people, processes, and the environment. In Asia, our Malaysian facility operates around the clock, testing filters per ASHRAE Standard 52.2-2007 and European Standard EN779 and EN1822. This facility also performs burst tests and customer-specific or requested evaluations of our filters and our competitors. Reviewing hundreds of filters per year, this laboratory ensures that our products exceed published specifications and provide the improved air quality our customers desire.



The Camfil Malaysia facility provides testing data for our customers and is used for research to support progression in the development of filter testing standards.

Additional Filter Testing Facilities Worldwide

Camfil operates a state-of-the-art carbon or gaseous contaminant analysis laboratory. Equipped with the latest technology, adsorber products are developed to meet our customers' needs as their demands for cleaner air reach ever-higher levels. From casinos to ultra high technology cleanrooms, Camfil has the gaseous removal products for any application.



All of our facilities can test filters to any International standard and can also test a filter's capture ability on specific contaminants.

Scanning Electron Microscope (SEM)

In our quest to manufacture ultimate levels of air filtration, one of the tools we use is a scanning electron microscope (SEM). This is a type of electron microscope that images the sample surface by scanning it with a high-energy beam of electrons in a raster scan pattern. The electrons interact with the atoms that make up the sample, producing signals that contain information about the sample's surface topography, composition, and other properties, such as electrical conductivity.

In its primary detection mode, secondary electron imaging, the SEM can produce very high-resolution images of a sample surface, revealing details about 1 to 5 nanometer in size. Camfil can then study these particles in a three-dimensional form useful for understanding the surface structure of a sample. The information obtained can then be used to ensure proper filter selection or provide information for the development of new filter media or air filters.



All of the photos of sub-micron particles used in this catalog were taken with Camfil's SEM in Trosa, Sweden.

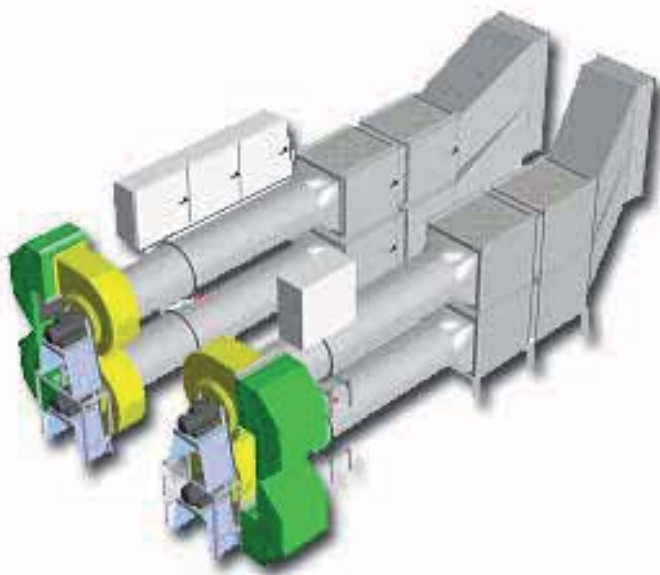
Camfield Lab

Camfil takes the filter testing laboratory to the customer with a unique “mobile” approach to testing air filters in real-life operating conditions. Called the Camfield Lab, this new test rig makes it possible to determine the most effective filtration solution based upon the geographic location of a building and its specific environmental air quality circumstance. The Camfield lab unit is shown in the photo below.



The Camfield Lab consists of four parallel ducts that may be fitted with prefilters and final filters, allowing four different filter combinations to be tested at the same time. The test rig, installed on a flatbed, can be transported to any desired location and parked in the test area. Using actual environmental conditions, filter performance may be evaluated using various air filter types and efficiencies.

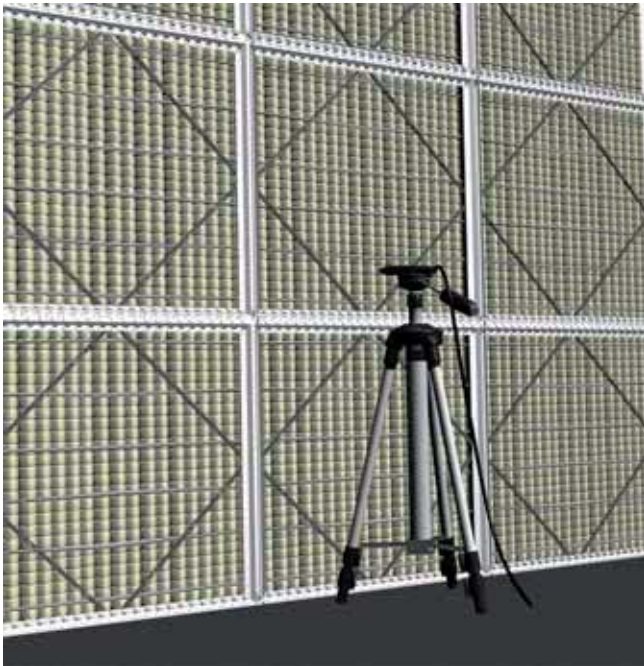
For example, placed in the immediate vicinity of an important facility (such as a government building, a hospital, etc.), the Camfield Lab could be used to: (a) analyze the ambient air quality; (b) determine whether the building is currently equipped with adequate filtration to handle these contaminants; and (c) further determine the best type and level of filtration for the building by simultaneously testing several filter combinations. It thereby combines the controlled environment of a laboratory with a more meaningful real world setting, offering the “best of both worlds” from a testing standpoint. Although the test rig will be used mainly at outdoor locations (due to its size), it could be placed indoors at a large facility, such as a stadium or convention center.



Each Camfield Lab includes four independent testing ducts, two on each side of the unit.



In-Situ Testing



Today's air filtration marketplace includes products, offered in many configurations, that present various advantages and disadvantages when compared to other air filter offerings. There are also different types of media incorporating varying principles of particle capture, each with its own advantage when applied in a ventilation and air conditioning application.

How can filter users differentiate manufacturers' claims and make intelligent decisions as to what products are applicable to meet their needs? Historically, many depended upon test reports. Unfortunately, today's testing laboratory methodologies may not give a true barometer of a filter's performance over time, as these filters are not tested under real life conditions.

Camfil addresses these concerns by performing actual on-site (in-situ) filter performance evaluations using industry defined procedures. With the user designated participants, information is obtained using an optical particle counter which measures the number of particles in multiple bands, including sub-micron; defined as repairable and critical to human health.

Camfil then provides a final report which includes a particle size versus efficiency analysis detailing all of the tested filters abilities to capture large particles and sub-micron size particles, that may affect health or processes. Pressure drop data, relative to a filter's actual life within a system, and its overall effect on system airflow and use of energy is also detailed.

Users can evaluate the use of increased media area compared to standard media area offerings. They can evaluate filters of similar construction that use different types of media. And most importantly, they can evaluate Camfil products against other manufacturers offerings.

The process includes a facility survey to establish the integrity of the filter holding mechanisms, the overall HVAC worthiness of the system, and an analysis of past usage data to develop a baseline of comparison. Actual in-place testing begins with an initial filter efficiency test and continues on a periodic schedule (time-dependent upon the type of filters being evaluated).

The final data is often used to demonstrate performance to the facility's required standard of care for air quality and to prove that their filter expenditure has the lowest life-cycle cost.

Camfil also maintains a database of historical analyses from other facilities that may assist others in their selection of filters for their similar applications.

Contact your local Camfil office or distributor for details on Camfil's In-Situ Filter Evaluation Program.

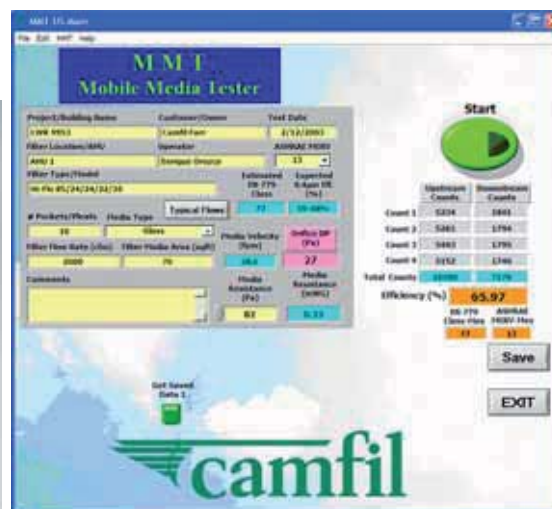


Camfil Mobile Media Tester

Filters may use microfine media fibers, coarse media fibers, synthetics, or polyesters — which will work in your application? Which will provide the efficiency required to ensure that you are protecting the health of your building's occupants or ensure that your process is as clean as it needs to be?

Camfil now offers our Mobile Media Tester to answer your filter performance questions and demonstrate that you are obtaining the particle removal efficiency you are paying for.

This portable testing system can evaluate any high-efficiency, flat-sheet filter media, including samples obtained directly from your filter stock, existing air handlers, or samples that you request from your filter distributor. Contact your Camfil sales office or distributor for a media evaluation at your facility today.



Camfil CamTester

Air quality should always be the number one criterion for the selection of air filters. But, with today's sky-rocketing energy costs, with no downturn in sight, the energy used by a filter must be part of the filter selection equation. Media area, configuration, and the type of media all play a part in the energy that a filter will use over its life in the system. How can a user wade through all of the printed materials available or evaluate products that may not have the detailed information specific to the product they want to use?

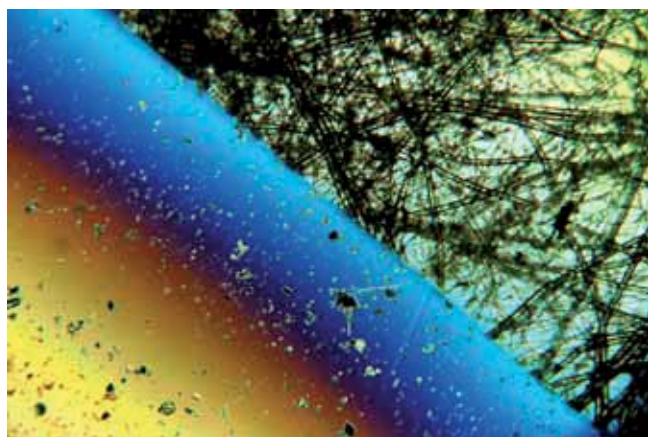
Your Camfil representative can address these concerns with the Camfil Cam-Tester. Users can evaluate any air filter for pressure drop, at any airflow they desire, to establish which filters will use more energy. Filters may be clean out-of-the-box, or they may be removed from a system and tested through their usage period. Up to 70% of the cost of moving air through an HVAC can be used by the air filters. Judicious filter selection here can provide high dollar energy savings with little, or no physical changes to the system.

Contact your local Camfil sales office or representative for a Cam-Tester evaluation today.

Indoor air quality, EN 13779

The industrialised world

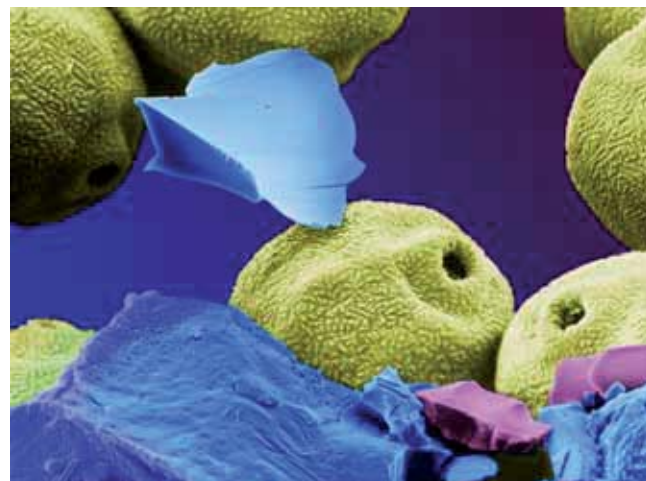
The industrialised world has changed immeasurably over the past 50 years. One very real difference is that the air that we breathe is more heavily, and more diversely, polluted. Although there are natural sources of pollution, the main concern is pollution caused by human activity. Tens of thousands of synthetic chemicals (which do not exist in any natural state) are now manufactured at an estimated rate of more than a billion tons per year. These chemicals are released into the atmosphere when they are produced, and when they are used they can travel great distances. They inevitably form part of our lives. Our lifestyles (work and leisure) mean that we spend more and more time inside buildings. The fact that buildings have to be ventilated means that we are increasingly exposed to particulate and gas pollution from the outdoor air.



The impact of pollution on our health

Air pollution can be categorised as either particulate (dust) or gas (molecular). Particles enter the body and the respiratory system via breathing. Gas or molecular pollution also penetrates the body via the air we breathe, but from the lungs it enters the bloodstream and in turn infiltrates the whole body. Though these chemicals may be invisible,

pollution does not pass us by. It takes numerous different forms, for example vehicle exhaust gas, factory chimneys, the dust raised by car traffic and cigarette smoke. It has been known for some time that exposure to pollution has an impact on human beings. The common symptoms are headaches, watering eyes and lower performance at work. Such symptoms are traditionally referred to as Sick Building Syndrome or similar terms.



The new European Standard for Ventilation

European Standard EN 13779 is aimed at achieving a comfortable, healthy indoor environment in all seasons with acceptable installation and running costs. EN 13779 has now been adopted as a national standard in all countries. It specifies the required filter performance in a system to achieve good IAQ taking into consideration contamination in the outdoor air. Outdoor air is split into 3 categories, from ODA 1, in which the air is pure apart from temporary pollution such as pollen, up to ODA 3 with high concentrations of gas and particles. This elevated pollution level ODA 3 is now typical of the contamination in urban areas.

Recommendations in EN 13779 for air filters

Outdoor air quality	IAQ Indoor Air Quality			
	IDA 1 (High)	IDA 2 (Medium)	IDA 3 (Moderate)	IDA 4 (Low)
ODA 1 (pure air)	F9	F8	F7	M6
ODA 2 (dust)	F7 + F9	M6 + F8	M5 + F7	M5 + M6
ODA 3 (very high concentrations of dust or gases)	F7 + GF + F9	F7 + GF + F9	M5 + F7	M5 + M6

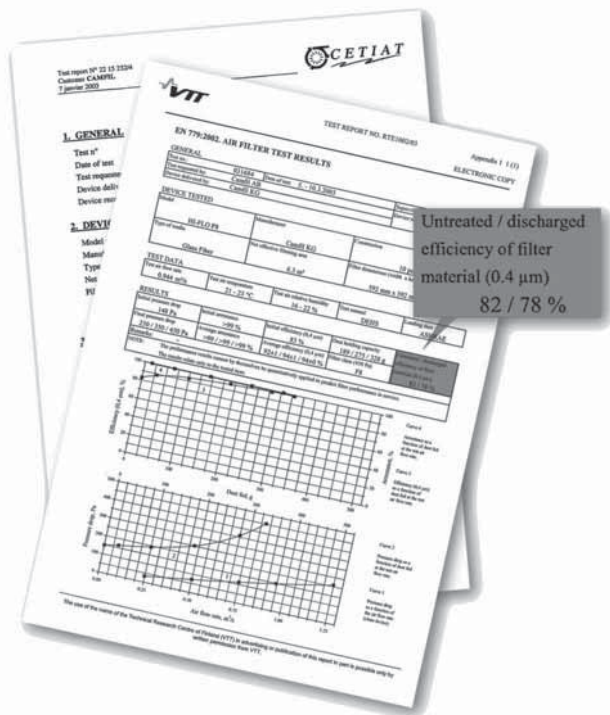
CITY

Our range of 'CITY' filters has been developed with the sole purpose of combating atmospheric pollution and its major components.

CITYCARB and CITYFLO combine particulate filtration with molecular and odour filtration. They are suitable for any new installation and can be readily installed to upgrade and improve systems currently equipped with standard filters.

With its higher molecular adsorption, CITYSORB is ideal for highly polluted urban environments. CITYSORB must be fitted in conjunction with a particulate filter above F7 efficiency, HIFLO or OPAKFIL type.

Eurovent Certified Performance



Air filter certification - You can count on us!

Camfil, in conjunction with the main independent test laboratories in Europe, is committed to bringing you the highest levels of transparency with regard to the new test protocols for air filters.

The European Committee for Standardisation has recently published a new standard on "Particulate air filters for general ventilation - determination of filtration performance". One of the aims of this new standard is to detail the in-situ performance of an air filter.

This new test protocol provides accurate data on the effectiveness of your air filters operating under real life conditions. Please always specify filters tested in accordance with EN779:2012. Your Camfil representative is available to explain this standard in detail should you require it - you can count on us!

Air filter performance

At Camfil we are going a step further to ensure the best possible performance for our customers. The European ventilation industry organisation Eurovent, in collaboration with several European air-filter manufacturers, has developed a certification programme to guarantee that our products live up to our promises.

The key elements of the programme are that:

- **Published data must be correct**
- **The products must comply with the EN779:2012 standard**
- **Filters must be tested by independent laboratories - SP in Sweden and VTT in Finland**
- **The test laboratories must be ISO 17025 certified**
- **We as manufacturers must be quality certified to ISO 9000 or a corresponding standard**
- **Each year, Eurovent selects, at random, four new filters from our range for inspection**

Read more on Eurovent's website: www.eurovent-certification.com

Eurovent's certification of our fine-dust filters means that you can rest assured that we live up to the performance requirements and the data we print in our official documentation. Our fine-dust filters are tested by independent laboratories selected by Eurovent and that means security for you. Select Camfil air filters with Eurovent certification - its guaranteed!



Independent test results

Our Eurovent certification covers bag filters, compact filters and panel filters in classes M5-F9, tested to EN779:2012. The initial pressure drop must remain within the tolerance levels set out in EN779:2012.*

All filters that we officially market in brochures or on our website in these filter classes are covered by the certification. Each class contains a range of product groups:

- **Same filter media/material (such as fibreglass)**
- **Same basic design (such as bag filters, compact filters etc)**
- **Same or lower air speed/net filter area**
- **Same filter class: M5, M6, F7, F8, F9**
- **Published data must be available, specifying the model, type, filter material, filter class as per EN779:2012,**
- **Nominal airflow and initial pressure drop at nominal airflow.**

The filters are tested at independent test laboratories - in Sweden, the Technical Research Institute of Sweden, SP, in Borås; in Finland, VTT in Espoo. These are the only laboratories in Europe that are accredited to ISO 17025.

The test laboratories are not told which company's products they are testing, but are only given a number that Eurovent assigns to each individual filter.

*) Tolerance levels for initial pressure drop defined in EN779:2012: $+(10\%+Mt)$ or $+(10Pa+Mt)$, whichever is highest. $Mt = 5Pa$ (tolerance level defined in EN779:2012)

European Standard EN 1822:2009

All HEPA / ULPA filters produced by Camfil are supplied fully in accordance with the European Standard EN 1822:2009

- Qualified personnel responsible for testing.
- Unique serial number for each filter.
- Clear, unambiguous inspection procedures specifying test conditions, target values and actual performance of our filters.
- Complete traceability of materials and operations.
- Equipment and systems certified by accredited bodies.

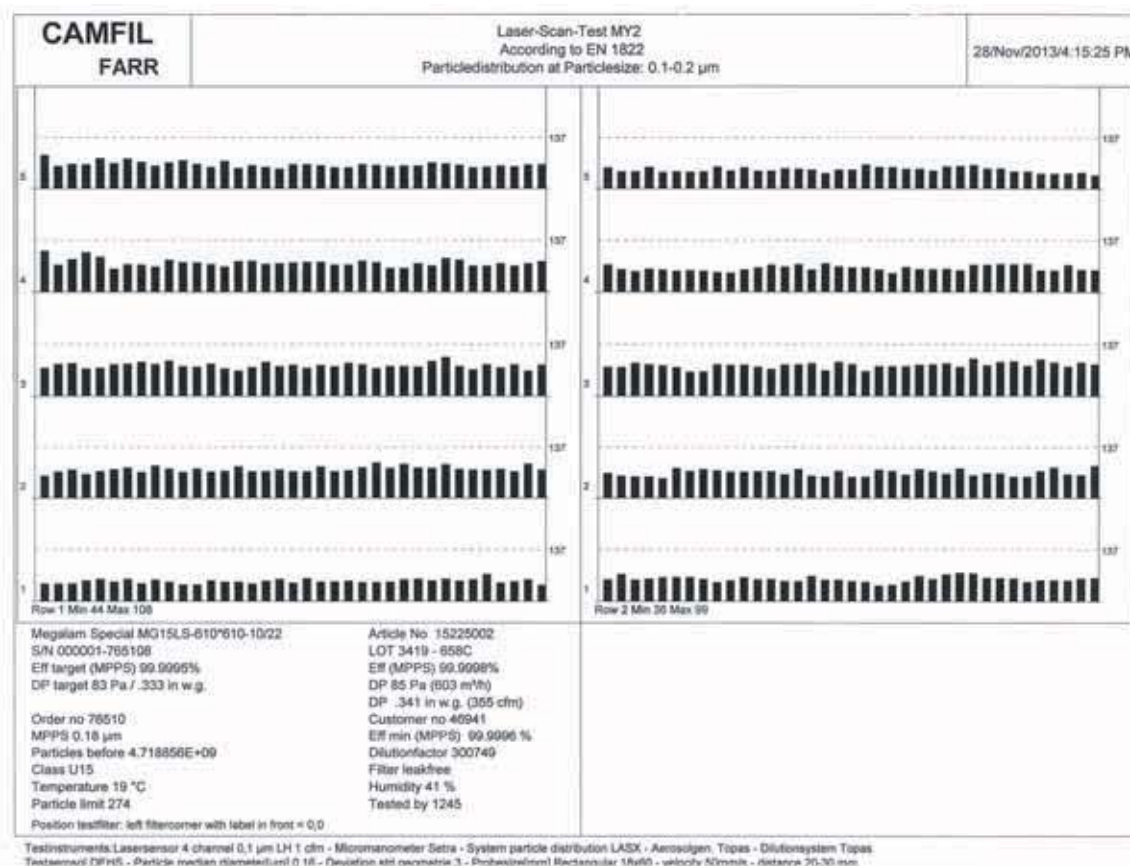
The CAMFIL extras:

- The filter label has a detachable copy which can be used to record the position of the individual filters in your installation.
- It can also be used as part of the validation process ensuring regulatory compliance of your installation.
- Automated scanning process to assure accuracy and reliability of the test result.

In short EN 1822:2009 means:

- Individually certified filters
- Tested using MPPS (Most Penetrating Particle Size) challenge.
- Detailed, standardised test procedures.
- Full traceability of materials and test data.

EN 1822:2009 Test Report



Filter Label



Would you like to reduce your energy outgoings?

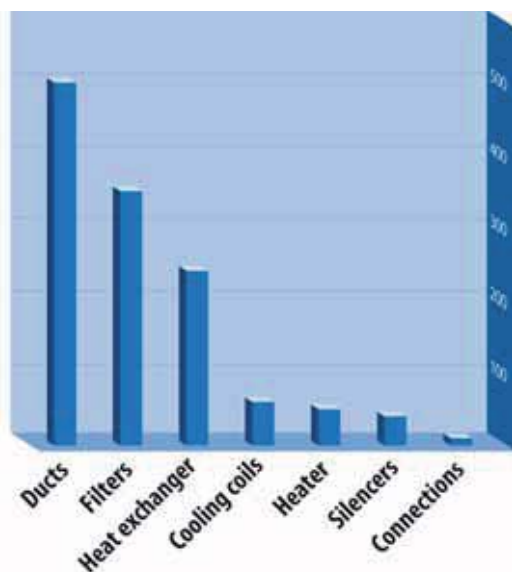


Economic optimisation of air filtration

The price of crude oil has more than doubled in recent years and the cost of electricity is rising throughout the world. The World Bank's Energy Group has predicted that total energy consumption is set to rise at the current rate for at least the next 50 years.

The cost of ventilation

Ventilating buildings, as we know, can be a very expensive business. The average energy cost of filters is around 30% of the total costs of the system. By choosing the right filter, for example the F7 for its efficiency and its very low average pressure loss, energy savings can be made whilst maintaining a high level of IAQ. When you consider that the air filter is the most inexpensive and simplest component to change, savings can be made quickly.



Typical pressure loss (Pa) in a ventilation system with 2 stage filtration

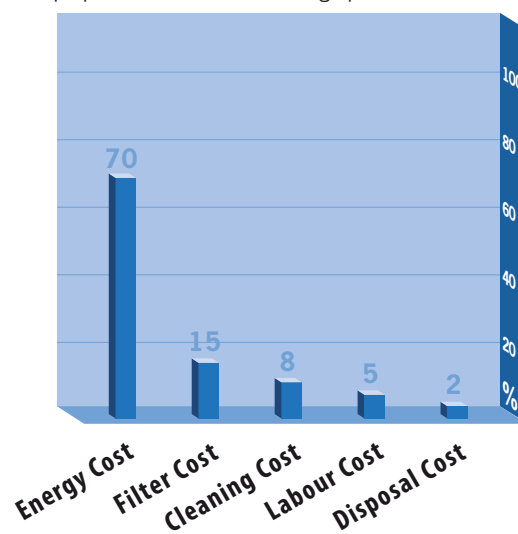
$$1\text{Pa} = 1 \text{ USD}$$

A rule of thumb, for a typical installation running for one year, is that one additional Pascal in pressure drop adds 1 USD per filter in extra energy cost.

A badly designed filter construction could add 50 Pascal compared to a well engineered filter, even if it claims to have the same efficiency. In other words it adds 50 USD to the annual energy bill, for every filter.

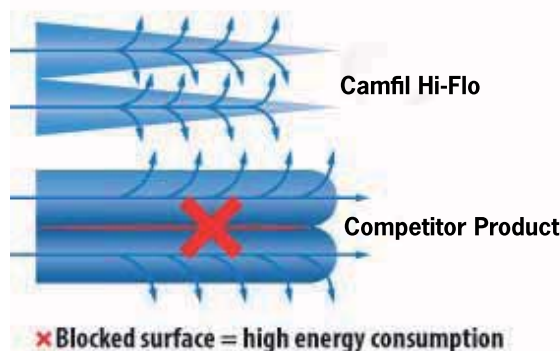
70% of the total cost comes from energy costs

Calculations show that energy normally accounts for 70% of the total cost of the life cycle of an air treatment system. Energy consumption is in direct proportion to the filter's average pressure loss.



Choosing the right filter saves energy

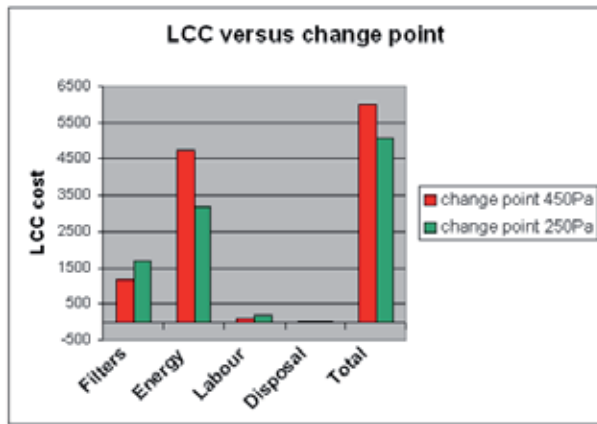
In order to optimise the lifespan of the filter and to reduce energy consumption, it is important to bear in mind the extent to which their configuration and their structure influence the average pressure loss.



Changing the filter at the right time saves energy

Changing filters at the right time is as important as optimizing the filter selection and can contribute to significant savings. Extending filter usage beyond its normal life will lead to a number of issues including excessive energy consumption, hygiene issues and reduced airflow.

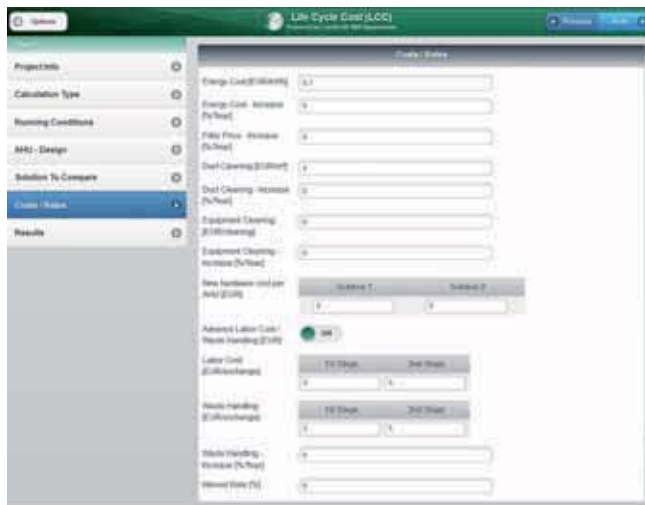
Would you like to reduce your energy outgoings?



Software aimed at helping select the right filter = optimising energy costs

For over 50 years, Camfil has played a pioneering role in designing filters with low average pressure loss for all efficiency levels for air conditioning and ventilation systems. Camfil was the first filter manufacturer to develop sophisticated software that calculates the overall cost for the complete life cycle of air filters. As part of our continuous improvement, this software has evolved over time and it uses real life data collected from numerous tests in real use conditions. This enables us to calculate the pressure loss of the filter and its actual lifespan, rather than relying on theoretical calculations.

For more information and assistance, please contact your nearest sales office of Camfil.



Molecular Filtration Technical Services

Beyond Filtration

Camfil provides a comprehensive range of measurement services to complement their range of air filtration products. The services are used to assist in product selection, product validation and optimization of product performance.

Where possible we base our testing on international standards to ensure comparability and repeatability of results.

All our testing facilities are ISO 9001 : 2000 certified and measuring equipment is calibrated traceable to national standard.



Campure Coupons

Campure or reactivity coupons are an economical and simple way to assess the corrosive potential of an environment.

The coupons comprise of a pair of copper and silver foil strips which are exposed to the environment. After a given period, the coupons are returned to the laboratory where the surface corrosion is determined. The types and relative amounts of corrosion on each metal are indicative of the corrosive agents in the air.

Coupons may be used to assess an environment prior to selection and installation of a molecular filtration system and to validate the ongoing performance after installation.

Atmospheres may be classified according to the Instrument Society of America standard ISA-S71.04. Categories include Mild (G1), Moderate (G2), Harsh (G3) and Severe (GX).

Residual Life Analysis / Gigamonitor

It is important to be able to predict the impending failure of a molecular filter due to saturation of the media. This may be achieved through a programme of residual life analyses.

In this laboratory technique, a sample of media returned from the field is analysed for the residual content of the impregnation or chemical agent system.

A series of measurements made at 3 or 6 month interval allow the eventual deterioration in the condition of the media to be anticipated and plans put in place for a replacement.

Gas challenges

Camfil have a unique test facility that allows full scale molecular filters to be tested under conditions which precisely replicate those experienced in actual applications.

The molecular filtration test rig allows filters to be exposed to airflows with a wide variety of temperatures and relative humidities.

Site services

Camfil have the possibility to offer on-site support services. These may include:

- Supply and fit of filters.
- Removal and disposal of waste material
- Supply and fill of new media and in-site performance validation.

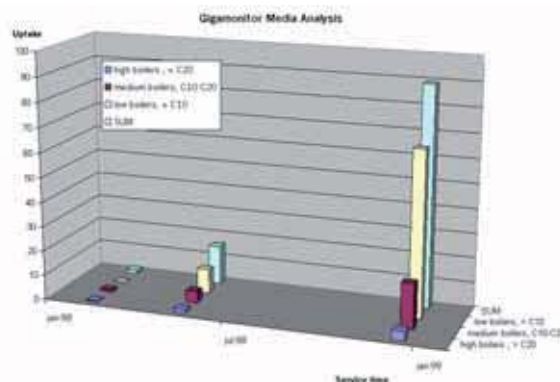


On-line corrosion monitoring (ISA Check)

Some critical or highly sensitive applications may require performance monitoring at a higher level than can be provided by a combination of the above techniques. In particular continuous real time monitoring may be required.

Camfil offers an "Environmental Corrosion Monitoring System" that will give a direct and continuous surveillance of gas levels, based on the reaction of internal copper and silver strips.

LEDs indicate the environmental according to the Mild, Moderate, Harsh, Severe classifications. The unit also monitors and displays the two environmental parameters that strongly influence corrosion rates: temperature and relative humidity. 4-20 mA outputs are available as standard for remote applications.



Molecular Filtration Technical Services

Gigacheck™

The Camfil Gigacheck™ is a passive analytical system to selectively measure airborne molecular contaminants (AMC) in cleanrooms and accompanying air handling systems used for microelectronics and integrated circuit manufacture.

Other possible applications include museums, airports, hospitals and oil and gas industries.

Common contaminants of analysis include acids, acid precursors, bases and ozone.

The kit and the samplers are supplied in a case and sealed plastic bags.

The Gigacheck™ can be located inside the cleanroom, in a ventilation duct, inside make-up air systems, or in a mini environment. A proven tool, it is small, light weight, cost effective, and does not require any electrical connections or field calibration.

The only requirements are ambient temperature and normal airflow.

Sampling time is 1 day – 1 month depending on the application. The Gigacheck™ provides average concentrations of AMC over the sampling period.

The Gigacheck™ is sealed and returned to our laboratory at the end of the exposure period.

The resulting data and information about the ventilation system and the process being protected allows us to design an optimized molecular filtration system based on your specific site condition.



Advanced Online Gas Monitoring

If you need to understand the short term variation of airborne molecular contaminant (AMC) concentrations in your cleanroom for an extended period of time, Camfil online monitoring equipment will be the perfect solution. Equipped with 8 sampling ports, our system is able to measure the concentrations of Ammonia (NH₃), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO₂), Hydrogen Sulfide (H₂S) or total reduced Sulfur compounds (TRS), down to a detection limit of 0.5 ppb(v). Data are recorded and can be plotted into graphs showing concentration changes over time in different location of your cleanroom or process equipments.

Our technology follows the recommendations of the International Technology Roadmap for Semiconductors (ITRS) for advanced air monitoring applications, using chemiluminescence technology for NO_x and NH₃, UV fluorescence detectors for SO₂ and H₂S, NH₃ and Sulfur compounds are the most critical contaminants in semiconductor and microelectronic applications, resulting in serious yield losses and product quality issues, even when present at trace levels. Please contact our local Camfil team of experts to assist you with your advanced online AMC measurements.

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.



ATEX

ATEX Directive: Explosive atmospheres

Two important new safety directives have entered into force in Europe. These new regulations come under the title of ATEX Directives and apply to manufacturers, suppliers and users of equipment intended for use in potentially explosive atmospheres (dangerous areas). Where no local regulations exist, the ATEX Directives could be used as a reference.

An explosive atmosphere is defined as a mixture with air, under atmospheric conditions, hazardous substances in the form of gases, vapors, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture. The 99/92/EC (ATEX 137) Directive known as the 'User Directive' requires employers to protect their employees from the risks posed by explosive atmospheres. The 94/9/EC (ATEX 95 or ATEX 100A) Directive on 'Equipment and protective systems intended for use in potentially explosive atmospheres' covers electrical and non-electrical products intended for use in hazardous places (gases, vapors, mists). Conformity with the ATEX Directives has been a legal requirement in all EU Member States

since 1 July 2003.

In biopharmaceutical applications, some procedures must use ATEX-classified filters in certain places (please see table). Camfil in Europe has developed HEPA filters and ATEX accredited housings for use in biopharmaceutical installations in order to prevent electrostatic dangers caused by gas or dust in an ATEX area. Camfil has developed specific versions of ATEX for most filters and housings used in biopharmaceutical installations in order to prevent electrostatic conditions, of hazardous substances in the form of gases, vapours, dangers caused by gas or dust in an ATEX area. Camfil's ATEX solutions are entirely certified in accordance with the requirements of the ATEX Directives with the appropriate EX marking, the ATEX conformity statement and the instructions for use.

Key to the table:

Definition of ATEX areas and corresponding product categories.
Definitions of areas

Gas	Dust	Areas	Definitions	Category ATEX	Typical suitability of place
0	20		Place where an explosive atmosphere is permanently present	1G	Equipment adapted to 0 areas
				1D	Equipment adapted to 20 areas
1	21		Place where an explosive atmosphere is probable occasionally under normal operating conditions	2G	Equipment adapted to 1 areas
				2D	Equipment adapted to 21 areas
2	22		Place where an explosive atmosphere is improbable under normal operating conditions, but, where applicable, only lasts a short time.	3G	Equipment adapted to 2 areas
				3D	Equipment adapted to 22 areas

All Camfil ATEX air filtering solutions

All Camfil ATEX air filtering solutions are certified for use in explosive gas atmospheres (Classes 1 and 2) and explosive dust atmospheres (Classes 21 and 22). They comply with European Standard EN 13463-2001 Annex C Non-electrical equipment for potentially explosive atmospheres, as attested by the conformity statement attached to these products.



Caring for the Environment

“How will your filters help you to reduce the environmental impact of your installations?”

Camfil has been involved in air quality for over 40 years, and has to set an example when it comes to the environment. It therefore has an obligation to provide its customers with practical assistance on green issues. With regard to complying with the law on waste disposal, Camfil is with you all the way; in designing products and services, Camfil shares your environmental concerns.

It is now widely acknowledged that air conditioning filters can be considered ordinary industrial waste, whereas filters used in environments containing potentially hazardous products (e.g. return air from clean rooms, spray booths and operating theatres) should be considered special industrial waste and must be disposed of by an approved route using accredited systems.

Please Note - your individual circumstances depend entirely on your processes and we recommend that you approach your usual waste disposal provider, who will be qualified to advise you on the matter.

In order to minimise waste, Camfil pay close attention to the life cycle of the product:

1. We make strenuous efforts to extend the lifespan of our filters and to optimise their performance, which means that you reduce your operating costs, the frequency with which you have to replace the filters and the cost of their disposal.

Just look at the large filter surface used in many of our products and remember large filter area is synonymous with long filter life.

2. We favour the use of recyclable or incinerable materials.

3. We are continually researching effective materials with low pressure loss, a parameter that has a direct influence on the energy consumed during the lifetime of the filter.

4. The Green CAMFIL range ensures that you can dispose of your used filters with less hassle and at lower cost. The use of plastics or cardboard lends itself to the incineration of used filters whilst ensuring compliance with all provisions of environmental law.

5. We minimise the weight of materials used in the construction of our filters which helps reduce the waste mass as far as possible when the filter reaches the end of its life.

6. In our ISO 14001 certified factories, we are phasing out the use of chloride solvents and hazardous products from our processes.



Follow up CFM

Conscious of the increasing importance attached by our customers to waste management, Camfil can support you and take charge of replacing and organising the disposal of certain used filters as part of its CAMFIL FILTER MANAGEMENT (CFM) programme. For more information and to find out whether this service might work for you, please contact us.



Camfilcaring

Our corporate responsibility goes beyond the products and services we offer. Camfilcaring is a program we have developed that not only covers the front end of our products and services, but also ensures we have responsible suppliers, use environmentally friendly production methods, minimize energy consumption and waste in manufacturing processes and cares for our employees and the community we operate in.



Camfil Websites



Our corporate website www.camfil.com contains a wealth of information as well as links to individual country websites.

This is a good starting point to keep you updated about our company, products and services, technology and applications. You will also find contact details of our offices, distributors and agents worldwide.



Read about **Industries** we serve with specific product recommendations for your application as well as technical papers and links to relevant websites. Our Quick Selection Guide provides an easy step by step recommendation of products that suits your needs.

The **Products** pages include all our main products and list key product features and benefits. Camfil is serving a wide range of OEM customers including the car industry, domestic appliances, medical devices, laboratory equipment, printing and the electronics industry. Whether it's in space, in an operating theater or in a lab, we offer equipment suppliers shared product development, fast prototyping and cost effective performing products.

The **Filter Technology** section is your technical library and a foundation from which you can converse with others about how air filters work. We also include links to relevant industry related websites.

The **Press Room** in About Camfil features movies and photos of the company's core business and technologies and is available for download.

The **Case Studies** section includes various studies done on specific industries which has proven our products performance in those areas.



The general product catalogue, industry specific segment brochures, case story presentations, product detailed info, awards and certificates is found in the **File Archive** section. Camfil File Archive is also accessible from everywhere by downloading the Android or iOS application to your phone or tablet.



<http://airfilters.camfilarr.us/>

is a website maintained by Camfil's North American organisation. This site contains many **case studies** regarding life cycle cost, energy savings and indoor air quality.



Information about Camfil's **Air Pollution Control products and services** can be found at www.camfilarrapc.com. This site includes references, case studies, industry specific applications as well as catalogues, drawings and datasheets.



camfil Product Catalogue
Camfil Asia Pacific / Middle East

Check for Updates v 1.3

COMPANY
PRODUCTS & SERVICES
APPLICATIONS
CASE STUDIES
FILTER TECHNOLOGY
SUSTAINABILITY
CERTIFICATES
HANDLING INSTRUCTIONS
TERMS & CONDITIONS
CONTACT Us
www.camfil.com

Click Map for Larger View of the Asia/Middle East Region

Product Catalogue
Applications
Case Studies
Sustainability

Clean air solutions
Comments or suggestions? Please send us an e-mail.  Download Adobe Reader

The catalogue can be downloaded and installed as a program on your desktop or laptop. It can also be viewed as an online catalogue on your mobile device.

To access the catalogue, please go to the URL address below:

www.camfilcatalogue.com

1. The Adobe Acrobat Reader is required to open the catalogue on your desktop or laptop. If you do not have Acrobat Reader, go to <http://get.adobe.com/reader/> to install the Program. Once installation is complete, open the catalogue.

To access the link with your mobile device, please scan the QR code below. Please ensure your mobile device has Adobe Flash Player.




camfil Product Catalogue
Camfil Asia Pacific & Middle East

WELCOME
Find useful information from our Product Catalogue. Now it comes with two options for your convenience.

Product Catalogue Application
Application can be installed on your desktop or laptop as a program. Can be used offline.
To install the application, click here

Online Product Catalogue
Allows the catalogue to be viewed online without installing the program. View only on Adobe Flash Player enabled devices.
To view this online, click here

Clean air solutions

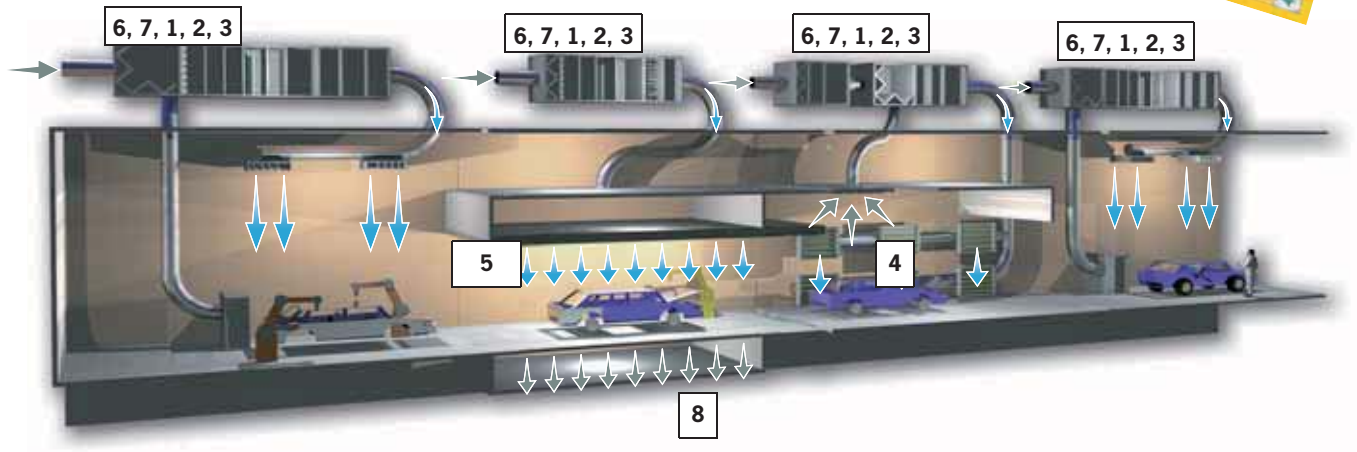
On this online product catalogue, you will find useful information on our:

- Company
- Products
- Applications
- Case Studies
- Sustainability
- Certificates
- Handling Instructions
- Terms & Conditions

Automotive Industry

Few industrial applications demand such a clean working environment as painting facilities. Paint spraying facilities require a constant supply of fresh air for hygiene and safety reasons. We currently provide clean air and services to many major automotive plants throughout the world. We provide the best possible cost effective clean air solutions, customised and performance-optimised to meet your demands. Supplied and delivered exactly according to your needs – by Camfil.

Segment brochure
enclosed on the
catalogue program



Automotive Industry recommendations



1. Hi-Flo



2. S-Flo



3. Opakfil



4. Airopac HT/Panolair HT



5. CDM-600



6. 30/30



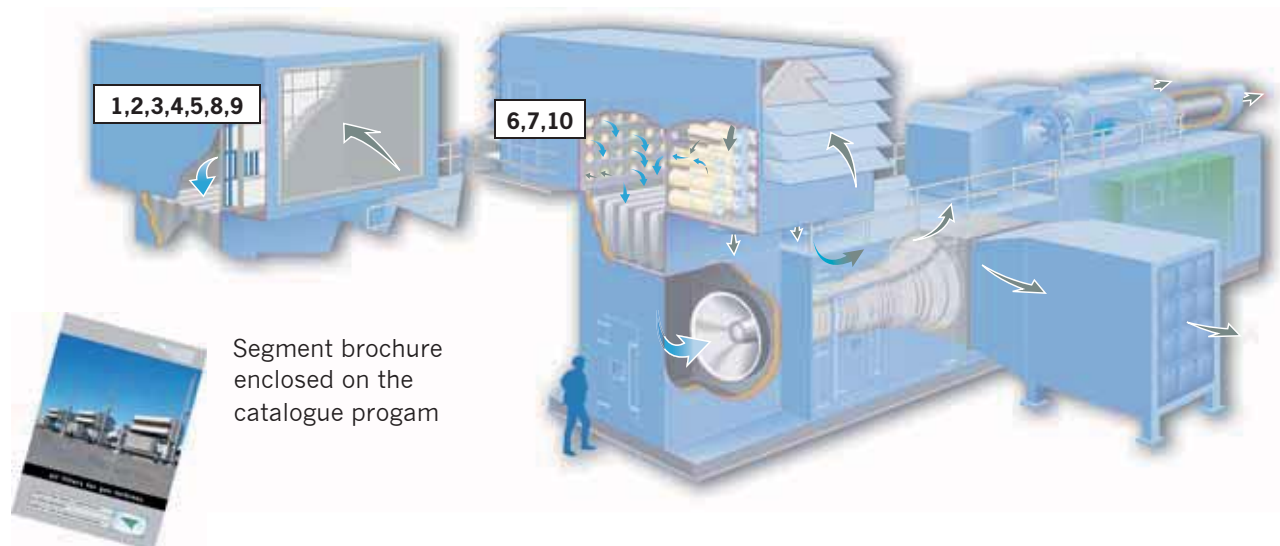
7. Hi-Cap



8. Cam Glass Media

Gas Turbines, Air Filters and Systems

Camfil provides systems solutions for the turbo machinery and power systems industry. Our solutions include filters, ducting, fans, silencers, and de-icing. With more than 40 years of experience, Camfil delivers value to customers worldwide whilst providing everyone with something essential - clean air.



Gas Turbine, Air Filters and System recommendations

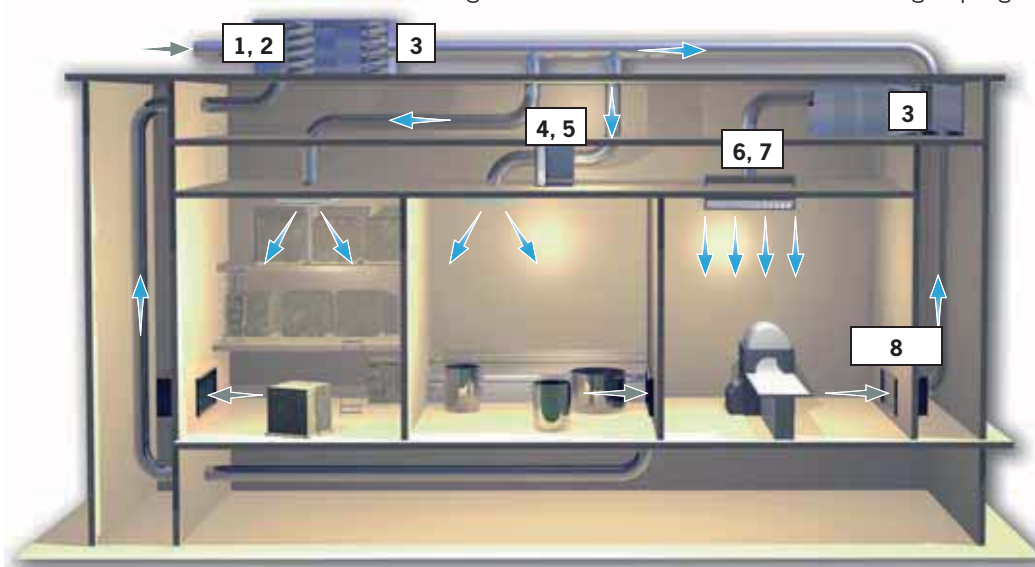


As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Food Industry

Protecting human health is a major concern for governments throughout the world. In many countries agencies associated with food safety have the authority to take direct action against manufacturers who fail to ensure the safety of foodstuffs that they produce. To prevent the air conditioning system from becoming contaminated, temperature, humidity and cleanliness must be closely controlled. Talk with the experts in clean air solutions - Camfil.

Segment brochure enclosed on the catalogue program



Food Industry recommendations



1. Hi-Cap XLS



2. Hi-Flo XLT



3. Opakfil Green



4. Absolute VG



5. Slimline RSR



6. Silenthood



7. 30/30

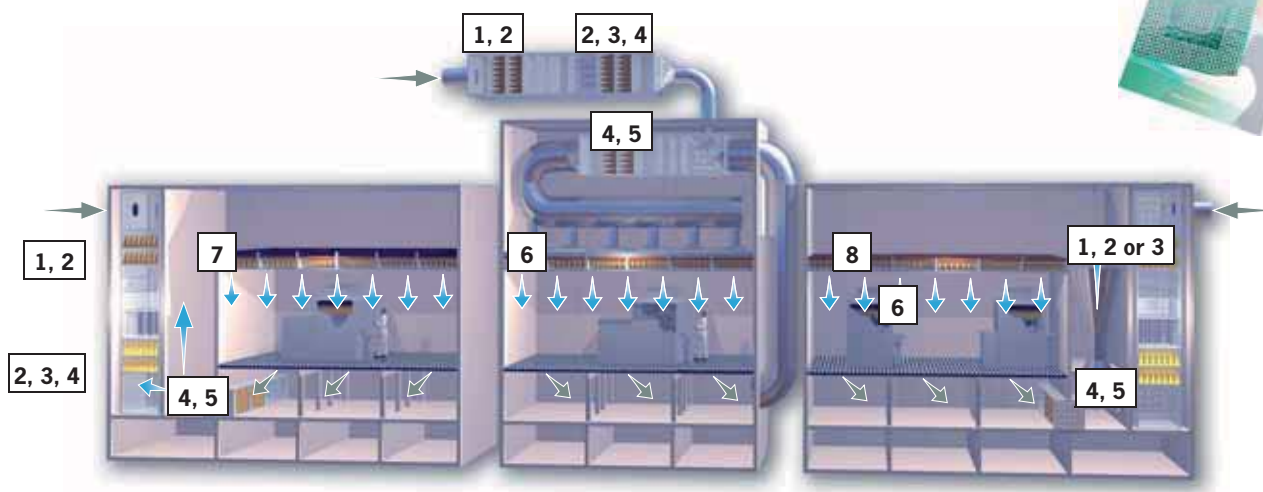


8. Ecopleat

Microelectronic Industry

Advanced production methods often require very clean air, and as technology advances these requirements look likely to increase. Camfil Farr is recognised as the leading supplier of high efficiency filtration products for the microelectronics industry. HEPA/ULPA filters are produced within controlled environments in our ISO 9000-certified plants and are individually tested and certified to ensure compliance. Our large production capacity ensures the availability of our products at all times throughout the world.

Segment brochure enclosed on the catalogue program



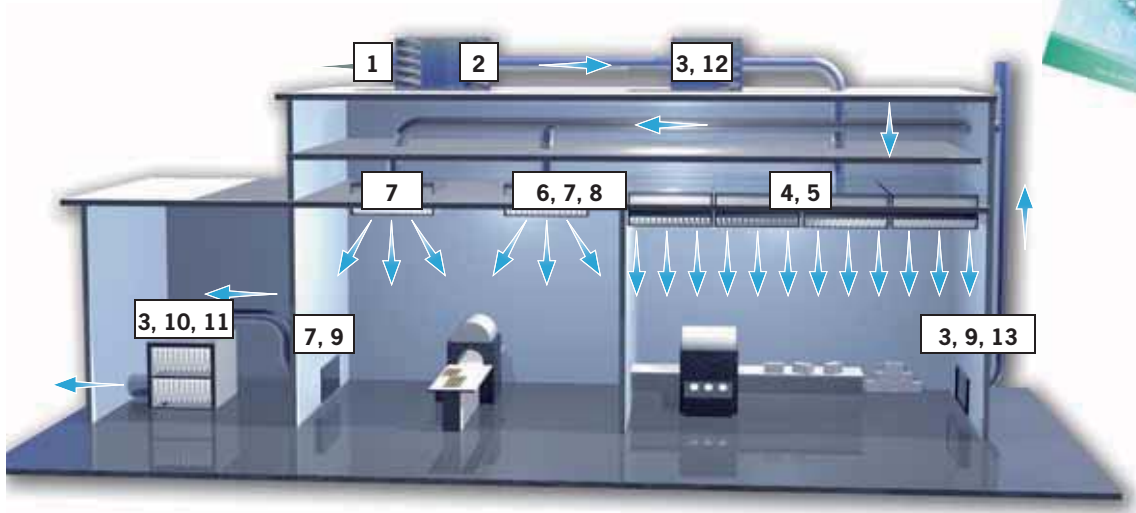
Microelectronic Industry recommendations



Life Science Industry

For more than forty years Camfil has been a leading supplier of air filter products and services to the Bio-Pharma Industry. Many of our clients have multiple facilities located around the world. Camfil is viewed by many of the largest pharmaceutical manufacturers as a partner and well positioned to support their air filtration demands on a local and global basis.

Segment brochure enclosed on the catalogue program



Pharmaceutical Industry recommendations



1. 30/30



2. Hi-Flo XLT



3. Absolute VG XL



4. Absolute DG



5. Megalam



6. Pharmaseal AP



7. Pharmaseal Exhaust AP



8. BIBO



9. Pharmatain



10. CamSafe



11. Airopac/Opakair



12. Filter Casing



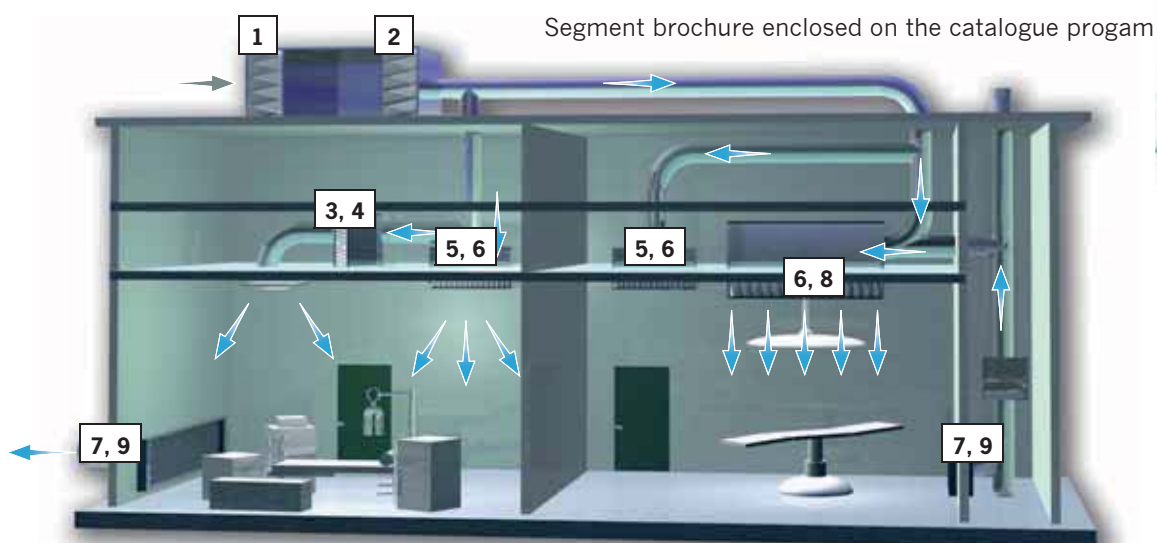
13. Ecopleat/Airopac

Camfil Asia Pacific and Middle East
www.camfil.com



Hospitals and Healthcare

Nowhere is air filtration more important than in health care facilities. Air filters offer excellent protection from airborne diseases in health care facilities, provided that they form part of an overall air quality control programme. Camfil provides a comprehensive solution that ensures the provision of this quality. Our extensive scope of supply ranges from providing air filters to satisfy the most demanding standards, air filter housings, system validation and monitoring, filter management, and specialist consultancy services. Our products provide safe and comfortable environments for patients, visitors and healthcare professionals.

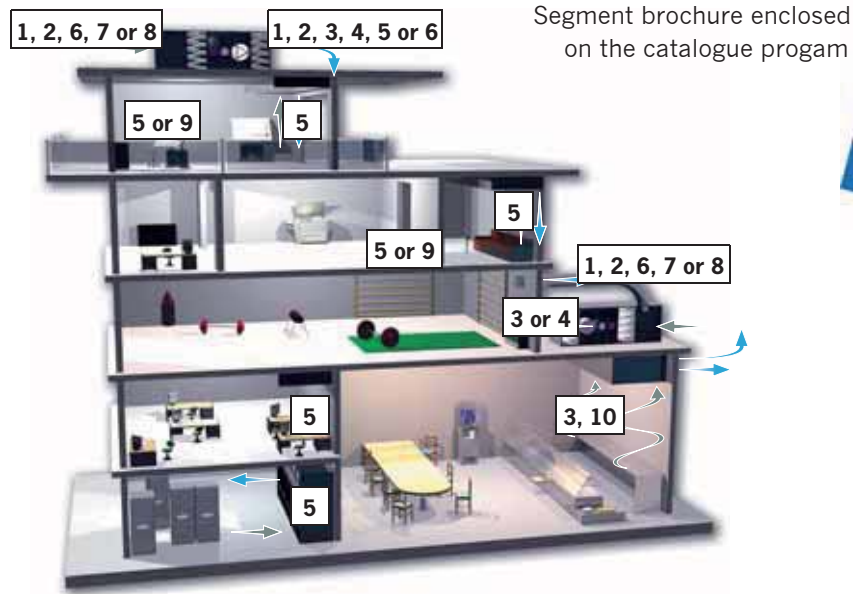


Hospital and Healthcare recommendations



Public Buildings

Concerns over public health have resulted in increased awareness about indoor air quality (IAQ). We now spend approximately 80% of our time in indoor spaces and legislation now requires that these spaces are comfortable, safe and without risk to health. Camfil filters for air conditioning systems help to safeguard human health by preventing airborne contamination from entering these environments. In addition correctly selected and maintained air filters keep air conditioning systems clean ensuring that they perform in accordance with design parameters. Camfil's extensive range of comfort air filters, are typically used in offices, schools and shopping centres etc.



IAQ recommendations



1. 30/30



2. Hi-Cap XLS



3. CityPleat



4. Hi-Flo XLT



5. Hi-Flo



6. City-Flo



7. Opakfil Green



8. CityCarb



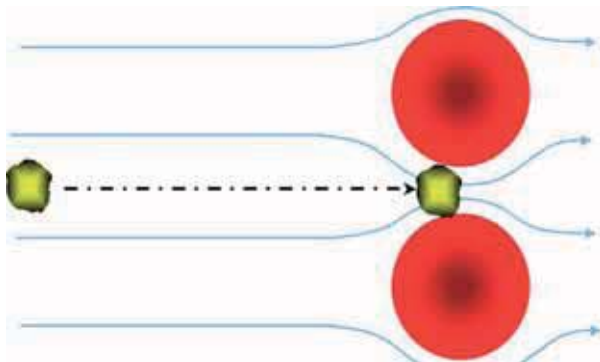
9. CamCleaner



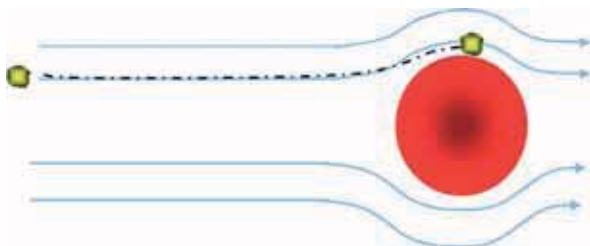
10. Ecopleat

Principles of Air Filtration

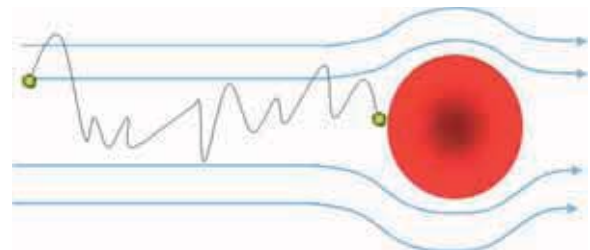
Five different collection mechanisms govern particulate air filter performance: straining, interception, diffusion, inertial separation, and electrostatic attraction. The first of these mechanisms applies mainly to mechanical filters and is influenced by particle size. Electrostatic attraction is obtained by charging the media as a part of the manufacturing process.



Straining (sieving) occurs when the opening between the media members (fibers, screen mesh, corrugated metal, etc.) is smaller than the particle diameter of the particle the filter is designed to capture. This principle spans across most filter designs, and is entirely related to the size of the particle, media spacing, and media density.

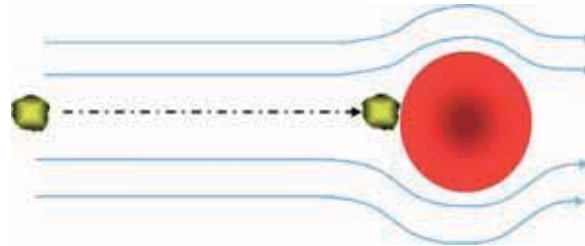


Interception occurs when a large particle, because of its size, collides with a fiber in the filter that the air stream is passing through.

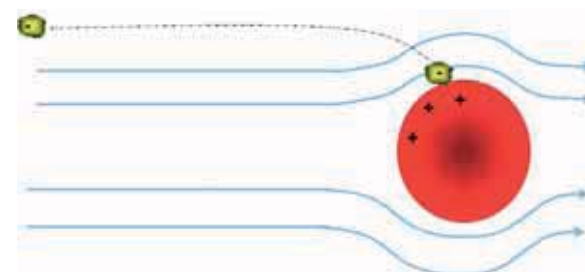


Diffusion occurs when the random (Brownian) motion of a particle causes that particle to contact a fiber. As a particle vacates an area within the media, by attraction and capture, it creates an area of lower concentration within the media to which another particle diffuses, only to be captured itself. To enhance the possibility of this attraction, filters employing this principle operate at low media velocities and/or high concentrations of microfine fibers, glass or otherwise.

The more time a particle has in the "capture zone", the greater the surface area of the collection media (fibers), the greater the chances of capture. Filter manufacturers have two distinct methods of addressing this principle — employ more square footage of fine glass-mat type media or employ less square footage of high lofted glass media.



Inertial separation uses a rapid change in air direction and the principles of inertia to separate mass (particulate) from the air stream. Particles at a certain velocity tend to remain at that velocity and travel in a continuous direction. This principle is normally applied when there is a high concentration of coarse particulate, and in many cases as prefiltration mode to higher efficiency final filters.

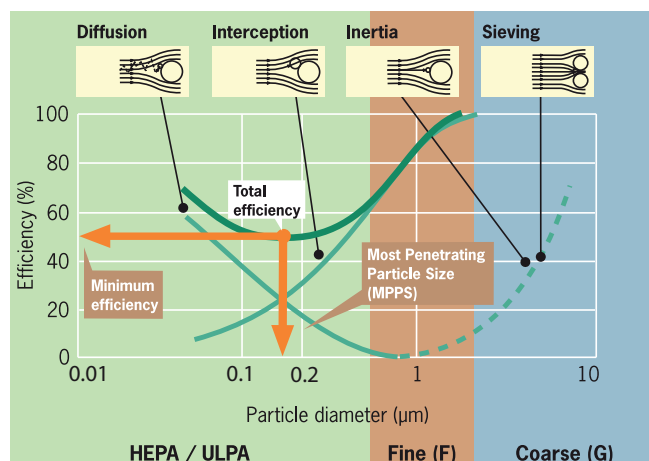


Electrostatic attraction plays a minor role in mechanical filtration. After fiber contact is made, smaller particles are retained on the fibers by a weak electrostatic force. The force may be created through a manufacturing process, or be dependent upon airflow across media fibers. The force is eradicated as media fibers collect contaminant that acts as an insulator to a charge.

Inertial separation and **interception** are the dominant collection mechanisms for particles greater than $0.2\ \mu\text{m}$, and **diffusion** is dominant for particles less than $0.2\ \mu\text{m}$.

Principles of Air Filtration

The following chart notes the four mechanical particle capture effect principles and their value to relative particle sizes.



As mechanical filters load with particles over time, their collection efficiency and pressure drop typically increase. Eventually, the increased pressure drop significantly inhibits airflow, and the filters must be replaced. For this reason, pressure drop across mechanical filters is often monitored because it indicates when to replace filters.

Conversely, electrostatic filters, which are composed of polarized fibers, may lose their collection efficiency over time or when exposed to certain chemicals, aerosols, or high, relative humidity. Pressure drop in an electrostatic filter generally increases at a slower rate than it does in a mechanical filter of similar efficiency.

Thus, unlike the mechanical filter, pressure drop for the electrostatic filter is a poor indicator of the need to change filters. When selecting an HVAC filter, you should keep these differences between mechanical and electrostatic filters in mind because they will have an impact on your filter's performance (collection efficiency over time), as well as on maintenance requirements (change-out schedules).



The above photo shows coarse fiber/electret media magnified 400 times. Coarse/electret fibers, because of their large size, are easier and less expensive to produce. Their primary effect of particle capture requires a charge imparted on the fiber during the manufacturing process. As the charge dissipates because of particulate loading, so does the efficiency of the filter. This is a critical condition, as 99% of all particles are under 1 micron in size — the range where these types of filters suffer critical loss of efficiency.



The above photo shows fine fiber media magnified 400 times. Fine fiber media operates under a mechanical removal principle, and fibers do not lose efficiency over time. Their initial efficiency is indistinguishable from their actual efficiency over life, providing the user with the particle removal performance they have specified.

Product Performance Barometers

ASHRAE Standard 52.2

In ASHRAE Standard 52.2, an air filter's performance is determined by measuring the particle counts on both the upstream and the downstream of the air filter device being tested. The filter user is then provided capture efficiency values throughout a range of particle sizes, allowing them to be specific in selecting a filter that has the best efficiency for the contaminant they want to remove.

If a user wants to remove paper dust in a bill processing facility, they can select a filter with a high efficiency specific to the relatively large size of that contaminant. If the contaminant of concern is tobacco or welding smoke, they can select a filter specific to the much smaller size of that contaminant. Each manufacturer should be able to provide a graph for each product that shows that product's capture efficiency through the twelve individual particle size ranges of the test.

To simplify filter selection, the Standard defines a minimum efficiency reporting value (MERV). The MERV is a single number that simplifies the filter selection process by providing the specifier, or the user, a single value of specification for filter selection. For most filters that use mechanical principles of filter operation, this number will most likely be a minimum value at installation and throughout the life of the filter.

Particle Size Ranges of Standard 52.2

Range	Lower Limit (microns)	Upper Limit (microns)
1	0.30	0.40
2	0.40	0.55
3	0.55	0.70
4	0.70	1.00
5	1.00	1.30
6	1.30	1.60
7	1.60	2.20
8	2.20	3.00
9	3.00	4.00
10	4.00	5.50
11	5.50	7.00
12	7.00	10.00

Unfortunately, filters that use the principle of electrostatic attraction can 'fool' the test by providing a high MERV during the test, but due to the loss of electrostatic attraction during operation, a much lower value during application. The user may not be getting the particle removal efficiency that they originally specified.

Multiple studies have shown that coarse fiber media (charged synthetic media), unlike fine fiber media (fiberglass media), perform differently in real-life applications. Coarse fiber media depends on an electrostatic charge to achieve the published filter efficiency. As atmospheric air passes through the filter, with 99% of the particulate less than 1.0 micron in size, this very fine particulate will dissipate the charge, and the filter quickly loses efficiency.

Appendix J incorporates a non-mandatory filter-conditioning step to replace the 30 grams loading of ASHRAE dust that was defined in ASHRAE 52.2-1999 as the conditioning step. The revised standard will challenge the filter using a KCl (potassium chloride) conditioning method that closely mimics the aerosol size particle distribution that air filters will commonly experience when operated in "real-life" conditions.

This will provide air filter users and specifiers an additional value so they can further ensure the filter's performance for the intended application.

Filters that use fine fiber media operate on mechanical principles of particle removal, including impingement and diffusion. They do not lose efficiency over time, and typically, their rated MERV will be the MERV obtained when testing, using the optional method in Appendix J.

The user or specifier may take comfort that the published efficiency of the filter will be consistent throughout the life of the filter.

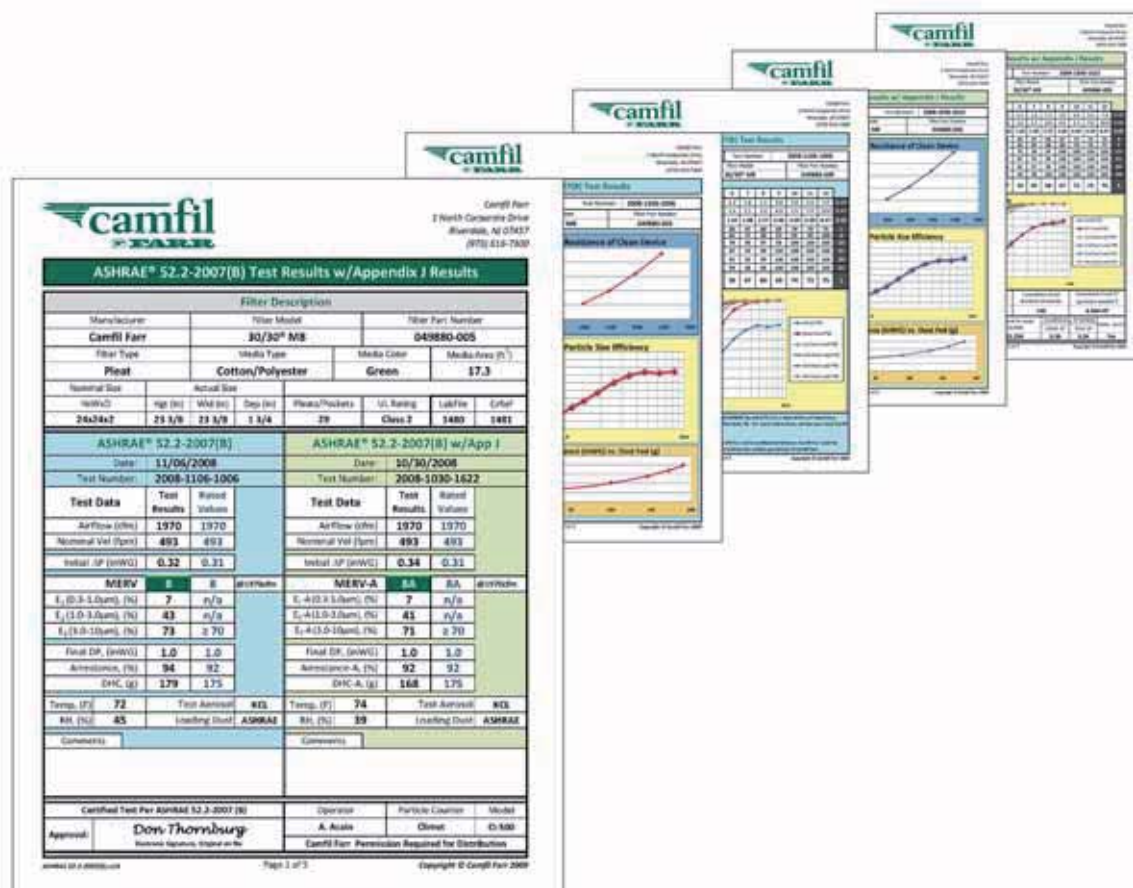
Importance of Change

The Appendix J conditioning step will allow manufacturers to show both test procedure results on reports and product literature. Users can access this information, or have filters tested at independent test laboratories, to judge air filter selection and specification for optimum air quality and equipment protection.

ASHRAE Research Project 1189 showed that using the KCl conditioning step closely replicated real-life filter performance. Thus, in the revised standard, if a filter shows a different MERV value between the standard test and the optional Appendix J test, it is safe to assume the Appendix J rating will be closest to the actual efficiency performance value the filter will deliver in real-life application.

Product Performance Barometers

Camfil ASHRAE Test Report (all 5 pages shown)



How to read an ASHRAE 52.2-2007 test report

1. Check the date of the test. Reports before 2008 may not have been run under the exact conditions specified in the updated Standard.
2. Was the filter operated at the proper velocity? For a 24" by 24" filter, the velocity should be 1970 cfm. For other sizes, the cfm should be relative to the increase or decrease in filter dimensions.
3. What was the MERV per the Standard?
4. What was the MERV-A, noted under conditioning step? It should be the same as the tested MERV.
5. Is a particle size versus efficiency graph shown, through all testing sizes?
6. Is there a chart of resistance versus airflow of the filter, under clean conditions?

MERV	Typical Contaminant	Typical Application
13 thru 16	0.30 to 1.0 micron. All bacteria, most tobacco smoke, droplet nuclei, cooking oil, copier toner, face powder, paint pigment	Hospital inpatient care, general surgery, smoking lounges, superior commercial buildings
9 thru 12	1.0 to 3.0 microns. Legionella, lead dust, milled flour, coal dust, auto emissions, nebulizer drops, welding fumes	Superior residential buildings, better commercial buildings, hospital laboratories
5 thru 8	3.0 to 10 microns. Mold, spores, hair spray, cement dust, snuff, powdered milk	Commercial buildings, better residential buildings, industrial workplace, paint booth inlets
1 thru 4	Larger than 10.0 microns. Pollen, Spanish moss, dust mites, sanding dust, paint spray, dust, textile fibers, carpet fibers	Minimum filtration, residential, window air conditioners

Product Performance Barometers

HEPA Filter Testing

HEPA/ULPA Cleanroom Filter Testing in Camfil Facilities

Filter Classifications

Quite a few inaccuracies and erroneous "jargon" are commonplace in the high efficiency filtration industry. One of the key issues pertains to nomenclature (i.e., HEPA, ULPA, VLSI, SULPA, etc.). This issue involves misconceptions regarding a filter's efficiency and the relationship to particle size.

CEN, the *Comite European de Normalization*, has developed a Standard, EN 1822:2009, based on particle counting at the Most Penetrating Particle Size (MPPS). This European Standard applies to High Efficiency Particulate Air (HEPA) and Ultra Low Penetration Air (ULPA) filters used in the field of ventilation and for technical processes (e.g., for clean room technology or applications in the nuclear and pharmaceutical industries).

Key definitions from this Standard include:

Penetration — the ratio of the particle count downstream of the filter to the particle count upstream.

Efficiency — the ratio of the number of particles captured by the filter to the number of particles challenging the filter.

Overall Efficiency/Penetration — the efficiency/penetration averaged over the "superficial/useable" face area of a filter element under given operating conditions of the filter.

Superficial/Useable Face Area — the cross-sectional area of the filter element, through which the air passes.

Local Efficiency/Penetration — the efficiency/penetration at a specific point on the superficial/useable face area of the filter element under given operating conditions of the filter.

Leak Threshold — local penetration greater than or equal to five (5) times the filter's overall penetration.

Filter Class	Overall Value % Efficiency	Overall Value % Penetration	Local Value % Efficiency	Local Value % Penetration
E 10	85	15		
E 11	95	5		
E 12	99.5	0.5		
H 13	99.95	0.05	99.75	0.25
H 14	99.995	0.005	99.975	0.025
U 15	99.9995	0.0005	99.9975	0.00025
U 16	99.99995	0.00005	99.99975	0.000025
U 17	99.999995	0.000005	99.9999	0.00001

This Standard allows a classification of filters in terms of efficiency and is, therefore, useful for both buyer and seller.

Basic Test Protocols

Leak Scanning

Camfil leak tests each Megalam Panel and Ducted Ceiling Module HEPA/ULPA filter. Testing is performed in Class 100 (M3.5) clean zones within a Class 100,000 (M5.5) cleanroom. All testing is conducted per the controlled and documented procedures of Camfil's ISO 9001 certified quality system.

To enhance upstream sampling capability, leak-scanning systems are equipped with dilution equipment for measuring high particle concentrations. Probe geometry has been optimized to maximize traverse rate and eliminate undetected leaks while maintaining isokinetic sampling. The entire face of the filter is scanned with overlapping strokes, including the media to frame interface. DEHS is Camfil's standard liquid challenge aerosol. By request we can also test with the solid aerosol Polystyrene Latex Spheres (PSL).

Any leak with a penetration exceeding five (5) times the filter's average rated penetration, is repaired per industry standards or customer specifications. Polyurethane and other repair materials are available upon request.

Menu-driven, computer controlled auto-scanning is utilized for standard filter configurations. Manual scanning is performed for small quantity, custom filter designs/sizes and leak repair.

Filter Media Efficiency Testing

Per Camfil raw goods supplier specifications, suppliers are required to test each master roll of Camfil filtration media for efficiency, utilizing Condensation Nuclei Counters (CNC) & Q127 Penetrometers. Test results are submitted to Camfil for review & material acceptance prior to release authorization.

Filter Efficiency Testing

Manual Scan: Camfil's computer integrated system gathers efficiency information from a fully encapsulated filter. The system features simultaneous upstream and downstream data collection. If the efficiency is lower than specified, the filter is rejected.

Auto-Scan: The discrete data points generated during the scan test are integrated to calculate the test filters global efficiency. If the efficiency is lower than specified, the filter is rejected.

Product Performance Barometers

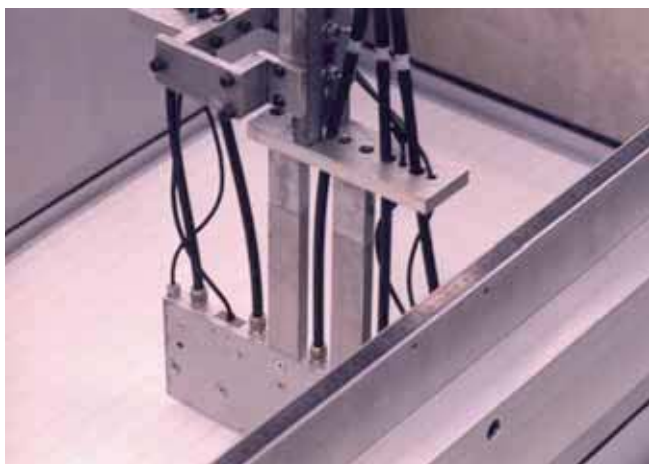
Filter Media Pressure Drop Testing

Per Camfil specifications, approved suppliers test each lot of media for pressure drop. Test results are submitted to Camfil for review & material acceptance prior to release authorization.

Filter Pressure Drop Testing

Manual Scan: During the test, the system continuously monitors and collects filter pressure drop data. If the pressure drop is higher than specified, the filter is rejected.

Particle Counter Scanning: If a particle count is detected, the operator checks the area for continuous counts. If continuous counts in excess of the specified leakage threshold are detected, the leak is repaired.



Auto-Scan Testing

Auto-Scanning Protocol

Camfil Auto-Scanners have been designed to detect pinhole leaks in HEPA/ULPA filters. The test apparatus is an automated, computer-controlled system, utilizing multiple particle counters for accuracy.

DEHS is the standard challenge aerosol. To further enhance system sensitivity, Camfil uses advanced dilution equipment for measuring high upstream particle concentrations. The automated system eliminates the possibility of incorrect test results that can result from human error. The computer interface controls filter airflow rate, test aerosol injection, particle counting upstream and downstream of the test filter, probe traverse rate, data reduction and data storage.



HEPA filter with label of test results.

UL 900

Camfil Megalam Panel and Ducted Ceiling Module type HEPA/ULPA filters are listed with Underwriters Laboratories per UL 900, "Standard for Test Performance of Air Filter Units".

Factory Mutual

Camfil's Megalam Panel and Ducted Ceiling Module type HEPA/ULPA filters meet the approval requirements of Factory Mutual Research Corporation (FM) for product construction of limited combustibility, when installed in an approved ceiling grid. For this approval, FM tests the filter as a component in a complete ceiling grid system.

During the ten (10) minute fire exposure test for Factory Mutual Standard FM-4920 ceiling system approval, there was no visible ignition of the Camfil filter, and no flame spread. For this test, the ceiling system tested was composed of a third party ceiling grid, third party gel sealant, and Camfil filter. The complete system passed all technical requirements of the standard.

References:

Printed copies of referenced documents may be purchased from the following entities:
 CEN, European Committee for Standardization, 36 rue de Stassart, B - 1050 Brussels, Tel: + 32 2 550 08 11; Fax: + 32 2 550 08 19
 IEST, Institute of Environmental Sciences and Technology, 5005 Newport Drive, Suite 506, Rolling Meadows, IL 60008, Phone: (847) 255-1561; Fax: (847) 255-1699
 Factory Mutual, 1301 Atwood Avenue, P.O. Box 7500, Johnston, R.I. 02919, Phone: (401) 275 3000; Fax: (401) 275 3029

Product Performance Barometers

UL Filter Testing

Air filters have always presented many numbers that users incorporated in their evaluations; including dust spot efficiency, arrestance, dust holding capacity, minimum efficiency reporting value (MERV) and various others. The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) greatly simplified the selection process when they introduced MERV. This value supplied the user with the filters' minimum particle capture efficiency ensuring that the filter would provide the protection level required for the process or to protect building occupants in specific applications. In 2007 they also added Appendix J, an additional testing step designed to expose filters that may not maintain their efficiency over time.

Now Underwriters Laboratories (UL) has simplified their Standard UL 900, for evaluating a filters' combustibility and smoke generation when the filter is exposed to direct flame. The designations UL Class 2 and UL Class 1 are no longer. UL 900 covers both washable and throwaway filters, used for the removal of dust and other airborne particles from mechanically circulated air in equipment and systems.

The vast majority of air filters have historically tested as UL Class 2. The criterion for this type of filter is that when tested, the air filter, when clean, burns moderately when attacked by flame, or emits moderate amounts of smoke, or both. A UL Class 1 filter was an air filter which, when clean, did not contribute fuel when attacked by flame and emitted only negligible amounts of smoke.

Some municipalities required the UL Class 1 product through their local code. In many cases, because of the different components of construction between Class 1 and Class 2 rated products the user experienced premium costs of two to three times the cost of a UL Class 2 product. Additionally there was some confusion in engineering circles that a UL Class 1 product was a 'fireproof' product. This was not the case as a Class 1 product could burn if submitted directly to an open flame, but was less likely to contribute combustion byproducts. Both classes, when clean, would self-extinguish when the flame source was removed from contact with the filter.

It is important to note, after a period of service, the combustibility and smoke generation of an air filter will depend upon the nature and quantity of the material collected by the filter. The test requirements of this Standard, for classification purposes, applies only to air filters in a clean condition. This is a critical step forward as UL as a recognized leader in independent safety certification facilitated a simplified, cost-conscious revision.



Camfil prints the above logo, as provided by Underwriters Laboratories, directly on our products, or on a product label, signifying the product is UL qualified. The logo is a registered trademark of Underwriters Laboratories.

Airborne Contaminants and Indoor Air Quality

Recommended minimum efficiencies by area as published by the
American Society of Heating, Refrigerating, & Air-Conditioning Engineers (2007 Applications Handbook).

Application	Minimum Filtration Efficiency
Airport Terminals	MERV 8 or better plus charcoal
Museums, Galleries, Libraries, and Archives	MERV 8 prefilter, plus charcoal and MERV 13 or MERV 14
Arenas & Stadiums	MERV 8 minimum, up to MERV 13 for facilities with expensive interior decor
Atriums	MERV 8 minimum, up to MERV 13 for facilities with expensive interior decor
Auditoriums	MERV 8 minimum, up to MERV 13 for facilities with expensive interior decor
Bars	MERV 8 or better plus charcoal with manual air purge
Bowling Centers	MERV 4
Bus Terminals	MERV 8 plus exfiltration
Cafeterias and Luncheonettes	MERV 8 or better
Communication Centers, Telephone Terminal Rooms	MERV 13 or better
Convention & Exhibit Centers	MERV 8 minimum, up to MERV 13 for facilities with expensive interior decor
Data Processing & Electronic Office Areas	MERV 11, minimum MERV 8
Garages	MERV 4
Hotel/Motel Assembly Rooms	MERV 8 or better
Hotel/Motel Conference/Meeting Rooms	MERV 8 or better
Hotel/Motel Guest Room	MERV 6 to MERV 8
Hotel/Motel Lobbies	MERV 8 or better
Houses of Worship	MERV 8 minimum, up to MERV 13 for facilities with expensive interior decor
Kitchens	MERV 4
Laboratories (Biological & Biomedical)	MERV 13 or MERV 14, plus possible HEPA
Laboratories (Chemistry & Physics)	MERV 13 or better
Natatoriums (pool areas)	MERV 8 minimum, up to MERV 13 for facilities with expensive interior decor
Nightclubs and Casinos	MERV 8 or better plus charcoal with manual air purge
Office Buildings	MERV 8 to MERV 11 or better
Radio and Television Studios	MERV 8 or better
Restaurants	MERV 8 or better
School Administrative & Office Space	MERV 6 to MERV 8
School Classroom	MERV 6 to MERV 8
School Storage	MERV 1 to MERV 4
Shipping Docks	MERV 4
Warehouses	MERV 4 to MERV 8

Medical Facility Area Designation	Minimum # of Filter Beds	Bed # 1	Bed # 2
Orthopedic operating room, bone marrow transplant operating room, organ transplant operating room	2	8	HEPA filters at air outlets ¹
General procedure operating rooms, delivery rooms, nurseries, intensive care units, patient care rooms, treatment rooms, diagnostic and related rooms	2	8	14
Laboratories and sterile storage	1	13	
Food preparation areas, laundries, administrative areas, bulk storage and soiled handling areas	1	8	

¹ Camfil recommends an intermediary stage to increase the life of the HEPA filter (MERV 13 or 14)

Standards, Regulations and Recommendations

Ventilation filters

Standards

Year	Reference	Type of test	Classification
1968	ASHRAE 52.2	ARRESTANCE EFFICIENCY	MERV 1 - 20
1980	EUROVENT 4/5	ARRESTANCE EFFICIENCY	EU1 to EU4 - EU5 to EU9
1982	AFNOR NF X 44.012	ARRESTANCE EFFICIENCY	
1993	CEN EN 779	ARRESTANCE EFFICIENCY	G1 to G4 - M5 to F9
2003	CEN EN779:2012	ARRESTANCE EFFICIENCY	G1 to G4 - M5 to F9

The new standard for general ventilation filters EN 779:2012

1. Measurement of filter efficiency using modern particle counting technique
2. The aerosol challenge is DEHS (the same as used with HEPA filters)
3. Classification based on a particle size of 0.4 μm
4. The test includes initiatives to determine the discharged efficiency of filters to better represent their performance in use. These are shown in Annexe A.

Why a new standard?

Certain types of filter media rely on an electrostatic effect to achieve a high level of efficiency whilst promising a low pressure drop for a given air volume.

It is important that users are aware of filters that rely on this electrostatic effect and are also informed about the degradation in efficiency once the electrostatic effect dissipates.

This new test procedure describes in Annexe 'A' a mechanism that removes the electrostatic effect by treating the filter material with Isopropanol. This discharges the filter and enables the real efficiency to be determined. The average efficiency of the filters after discharge is recorded on the certificate.

Filters are classified based on their performance against particles of 0.4 μm . Filters in Group F must achieve an average efficiency greater than 40%; below this they are included in Group G.

ASHRAE 52.2 / EN779 / EN1822 Cross Reference Table

ASHRAE 52.2	EN779 / EN1822
MERV 1	EN779 : G1
MERV 2	EN779 : G2
MERV 3	EN779 : G2
MERV 4	EN779 : G2
MERV 5	EN779 : G3
MERV 6	EN779 : G3

ASHRAE 52.2	EN779 / EN1822
MERV 7	EN779 : G4
MERV 8	EN779 : G4
MERV 9	EN779 : G4
MERV 10	EN779 : M5
MERV 11	EN779 : M6
MERV 12	EN779 : M6
MERV 13	EN779 : F7
MERV 14	EN779 : F8
MERV 15	EN779 : F9
MERV 16	EN1822 : E10
MERV 17	EN1822 : H13
MERV 18	EN1822 : H13
MERV 19	EN1822 : H14
MERV 20	EN1822 : H14

EN 779:2012 Classification

EN 779:2012 standard	Filter Group	Filter Class	Average arrestance α_m (%)	Average efficiency η_m (%)	Minimum Efficiency* of 0.4 μm particles %	EUROVENT 4/5 equivalent
Filter class limits						
Coarse (G)*	G2	65 $\leq \alpha_m < 80$	-	-	-	EU 2
	G3	80 $\leq \alpha_m < 90$	-	-	-	EU 3
	G4	90 $\leq \alpha_m$	-	-	-	EU 4
Medium	M5	-	40 $\leq \eta_m < 60$	-	-	EU 5
	M6	-	60 $\leq \eta_m < 80$	-	-	EU 6
Fine (F)**	F7	-	80 $\leq \eta_m < 90$	35	35	EU 7
	F8	-	90 $\leq \eta_m < 95$	55	55	EU 8
	F9	-	95 $\leq \eta_m$	70	70	EU 9

Initial efficiency (Ea) : * Ea < 20% ; ** Ea \geq 20%

Final pressure drop: * 250 Pa ; ** 450 Pa

Very high efficiency filters

Standards

Year	Reference	Type of test	Classification
1956	MIL STD 282	DOP	0.3 μm -
1972	AFNOR NF X 44.011	Uranine	0.15 μm -
1976	EUROVENT 4/4	NaCl	0.65 μm EU10 to EU14
1995	CEN EN 1822	MPPS	0.1 to 0.2 μm HEPA: E10 to H14 ULPA: U15 to U17

Standards, Regulations and Recommendations

EN 1822:2009 Classification

class 10,000. M 5.5. ISO 7; class D to class 100,000. M 6.5 ISO 8.

Filter group	Filter class	MPPS integral values			MPPS local values		
		Minimum efficiency (%)	Maximum penetration (%)	Minimum P.C.	Minimum efficiency (%)	Maximum penetration (%)	Minimum P.C.
EPA (E)	E10	85	15	6.7	-	-	-
	E11	95	5	20	-	-	-
	E12	99.5	0.5	200	-	-	-
HEPA (H)	H13	99.95	0.05	2,000	99.75	0.25	400
	H14	99.995	0.005	20,000	99.975	0.025	4,000
ULPA (U)	U15	99.9995	0.0005	200,000	99.9975	0.0025	40,000
	U16	99.99995	0.00005	2,000,000	99.99975	0.00025	400,000
	U17	99.999995	0.000005	20,000,000	99.99999	0.00001	1,000,000

EPA : Efficiency Particulate Air (filter)
 HEPA : High Efficiency Particulate Air (filter)
 ULPA : Ultra Low Penetration Air (filter)
 P.C. : Purification Coefficient

Classification as per Eurovent 4/4 recommendation, NaCl method

EUROVENT 4/4	Initial efficiency Ei (%)	Penetration Pi (%)
Filter class	Limits of filter classes	
EU 10	95 ≤ Ei < 99.9	5 ≥ Pi > 0.1
EU 11	99.9 ≤ Ei < 99.97	0.1 ≥ Pi > 0.03
EU 12	99.97 ≤ Ei < 99.99	0.03 ≥ Pi > 0.01
EU 13	99.99 ≤ Ei < 99.999	0.01 ≥ Pi > 0.001
EU 14	99.999 ≤ Ei	0.001 ≥ Pi

Clean rooms

Classification of different air qualities required for manufacture of sterile products

	Maximum number of particles per m ³ of a size greater than or equal to				Max. nbr: of organisms per m ³ (active)
	0.5 µm	5 µm	0.5 µm	5 µm	
	inactive (b)		active		
A	3,500	0	3,500	0	< 1
B	3,500	0	350,000	2,000	10
C	350,000	2,000	3,500,000	20,000	100
D	3,500,000	20,000	not defined (c)	not defined (c)	200

Pharmaceutical industry

Pharmaceutical industry

Guide to good Manufacturing Practice (2002)

(b) Corresponds approximately to the US Federal Standard 209 E and ISO as follows: classes A and B to class 100. M 3.5. ISO 5; class C to

Comparison of international classification standards

Nbr of part 0.5 µm/ m³ (approx.)	US Fed. Std 209 E 1992		EN ISO 14644- 1 1996	France AFNOR NF X 44.101 1981	European Union Pharma industry Guide GMP 1989	Nbr of part 0.1 µm/ m³ (approx.)
-	-	-	ISO 1	-	-	10
1	-	-	-	-	-	35
4	-	-	ISO 2	-	-	100
10	M 1	-	-	-	-	350
35	M 1.5	1	ISO 3	-	-	1,000
100	M 2	-	-	-	-	3,500
353	M 2.5	10	ISO 4	-	-	10,000
1,000	M 3	-	-	-	-	35,000
3,530	M 3.5	100	ISO 5	4,000	A and B	100,000
10,000	M 4	-	-	-	-	350,000
35,300	M 4.5	1,000	ISO 6	-	-	1,000,000
100,000	M 5	-	-	-	-	-
353,000	M 5.5	10,000	ISO 7	400,000	C	-
1,000,000	M 6	-	-	-	-	-
3,530,000	M 6.5	100,000	ISO 8	4,000,000	D	-
10,000,000	M 7	-	-	-	-	-
35,000,000	-	-	ISO 9	-	-	-

Permissible particle levels in different classes of clean rooms and clean zones

ISO classification on CD 14644-1 (1996)	Maximum permissible concentrations (particles/m ³ of air) of particles of a size greater than or equal to the size shown below					
	0.1 µm	0.2 µm	0.3 µm	0.5 µm	1 µm	5 µm
ISO 1	10	2	-	-	-	-
ISO 2	100	24	10	4	x	-
ISO 3	1,000	237	102	35	8	-
ISO 4	10,000	2,370	1,020	352	83	-
ISO 5	100,000	23,700	10,200	3,520	832	29
ISO 6	1,000,000	237,000	102,000	35,200	8,320	293
ISO 7	-	-	-	352,000	83,200	2,930
ISO 8	-	-	-	3,520,000	832,000	29,300
ISO 9	-	-	-	35,200,000	8,320,000	293,000

$$C = 10N(0.1/D)^{2.08} \text{ part / m}^3$$

Standards, Regulations and Recommendations

US Fed Std 209 E (1992)

		Class Limits				
Class Name		0.1 µm	0.2 µm	0.3 µm	0.5 µm	5 µm
		Volume Units	Volume Units	Volume Units	Volume Units	Volume Units
S1	English	m ³	m ³	m ³	m ³	m ³
M 1	-	350	75.7	30.9	10.0	-
M 1.5	1	1,240	265	106	35.3	-
M 2	-	3,500	757	309	100	-
M 2.5	10	12,400	2,650	1,060	353	-
M 3	-	35,000	7,570	3,090	1,000	-
M 3.5	100	-	26,500	10,600	3,530	-
M 4	-	-	75,700	30,900	10,000	-
M 4.5	1000	-	-	-	35,300	247
M 5	-	-	-	-	100,000	618
M 5.5	10,000	-	-	-	353,000	2,470
M 6	-	-	-	-	1,000,000	6,180
M 6.5	100,000	-	-	-	3,530,000	24,700
M 7	-	-	-	-	10,000,000	61,800

$\text{particles} / \text{m}^3 = 10M(0.5/d)^2 \cdot 2$
 $\text{particles} / \text{ft}^3 = Nc(0.5/d)^2 \cdot 2$

Air-conditioning / Comfort

Air quality of premises with non specific pollution

Regulatory aspect	Recommendations
Labour code / Circular of application of decrees 84/1093-1094 dated 7/12/1984	UNICLIMA Air-conditioning & Health guide (1993)
Fresh air Labour code Art. R235.2.6 Minimum arrestance efficiency 90% (G4 according to EN779:2012)	Air-conditioning system inlet: 85% opacimetric (F7 according to EN779:2012) Air-conditioning system outlet: 90% opacimetric (F8 according to EN779:2012)
Recycled air Labour code Art. R232.5.4 Minimum opacimetric efficiency 50% (F5 according to EN779:2012)	85% opacimetric (F7 according to EN779:2012)

FILTER ENGINEERING - Calculations

An air filter's efficiency is expressed in 3 forms:

The Efficiency %	$R = \frac{(I-E)}{I} \times 100$
The Penetration %	$P = \frac{E}{I} \times 100$
The Purification coefficient (no units)	$CE = \frac{I}{E}$

Clearly the purification

Clearly the purification coefficient is the most representative expression for high levels of filtration. E.g.:

Efficiency 99.995 % : CE of 20,000

Efficiency 99.9998 % : CE of 500 000

The second filter is 25 times more efficient than the first.

Nota : I = particle concentration upstream E = particle concentration downstream

Conversion table (%)

Efficiency	Penetration	Purification Coefficient	Efficiency	Penetration	Purification Coefficient
95	5	20	99.99	0.01	10,000
99	1	100	99.995	0.005	20,000
99.5	0.5	200	99.999	0.001	100,000
99.9	0.1	1,000	99.9995	0.0005	200,000
99.95	0.05	2,000	99.9999	0.0001	1,000,000
99.97	0.03	3,333	99.99995	0.00005	2,000,000
99.98	0.02	5,000	99.99999	0.00001	10,000,000

Comparative efficiencies

		on 1 µm			on 0.5 µm		
		E	P	PC	E	P	PC
90%	ARRESTANCE	10%	90%	1.1	5%	95%	1.05
50%	EFFICIENCY	30%	70%	1.4	10%	90%	1.1
65%	EFFICIENCY	45%	55%	1.8	25%	75%	1.3
85%	EFFICIENCY	85%	15%	6.6	70%	30%	3.3
95%	EFFICIENCY	95%	5%	20	90%	10%	10
95%	0.3 µm	≥ 98%	< 2%	≥ 100	≥ 98%	< 2%	≥ 50

E = Efficiency, P = Penetration, PC = Purification Coefficient

Operating life

An air filter's operating life is not directly proportional to its useful filtering surface. It is much better to opt for a model comprising 50% additional surface. This increases its operating life by 100%, not 50%!

Actual case study

Filter model	Effective filtering surface	Initial pressure drop at 3 600m ³ /h	Operating life*
Hi-Flo 3P 85	6.5 m ²	120 Pa	3.500 hours
Hi-Flo 3M 85	9.4 m ²	100 Pa	6.500 hours
Gain	3 m ²	20 Pa	3.000 hours
Outcome	+ 46% in surface (x 1.5)**	- 17% in energy	+ 86% in operating life (x 1.9)**

* Determined using the Camfil calculation charts in the Hi-Flo brochure, for an average town environment

** factor of increase

Energy costs

Energy consumed by an air filter due to its pressure drop:

Standards, Regulations and Recommendations

q = flow rate (m³/s)

dP = pressure drop (Pa)

h = operating period (hours)

e_f = fan efficiency (generally 0.6 to 0.7)

$$E = \frac{q \times dP \times h}{e_f \times 1000} = \text{kWh}$$

Conversions

Speed

1 m/s = 3.6 km/h	1 km/h = 0.278 m/s	1 ft/min = 0.00508 m/s	1 m/s = 196.85 ft/min
------------------	--------------------	------------------------	-----------------------

Length

1 mile = 1.609 km	1 km = 0.621 mile	1 yd = 0.914 m	1 m = 1.09 yd
1 ft = 0.305 m	1 m = 3.28 ft	1 in = 25.4 mm	1 mm = 0.039 in
1 mm = 1.000 μm	1 μm = 0.001 mm	1 μm = 1.000 nm	1 nm = 0.001 μm
1 μm = 10,000 Å	1 Å = 0.0001 μm		

Surface

1 ft ² = 0.0929 m ²	1 m ² = 10.8 ft ²	1 in ² = 6.45 cm ²	1 cm ² = 0.155 in ²
---	---	--	---

Volume

1 ft ³ = 0.0283 m ³	1 m ³ = 35.3 ft ³	1 ft ³ = 28.3 litres
---	---	---------------------------------

Flow rate

1 cfm = 0.472.10 ⁻³ m ³ /s	1 m ³ /s = 3 600 m ³ /h	1 m ³ /h = 0.278.10 ⁻³ m ³ /s
1 cfm = 1.699 m ³ /h	1 m ³ /s = 2 120 cfm	

Weight

1 lb = 0.454 kg	1 kg = 2.20 lb	1 oz = 28.3 g	1 g = 0.0352 oz
-----------------	----------------	---------------	-----------------

Force

1 kgf = 9.80665 N	1 N = 0.102 kgf	1 lbf = 4.45 N	1 N = 0.225 lbf
-------------------	-----------------	----------------	-----------------

Pressure

1 mmCE = 9.81 Pa	1 Pa = 0.102 mmCE	1 kPa = pz	1 kPa = 10.2 g/cm ²
1 kg/cm ² = 0.980665 bar	1 bar = 1.02 kg/cm ²	1 kg/m ² = 98.0665 kPa	1 kPa = 0.00987 atm
1 psi = 6.89 kPa	1 bar = 101325 Pa	1 atm = 101.325 kPa	1 mb = 100 Pa
1 mmCE = 1 kg/m ²	1 kPa = 0.145 psi	1 Pa = 1 N/m ²	1 in w.g. = 250 Pa

Energy

1 kgm = 9.80665 J	1 J = 0.102 kgm	1 cal = 4.184 J	1 J = 0.239 cal
1 kWh = 3.6 MJ	1 MJ = 0.278 kWh	1 Btu = 1.055 kJ	1 J = 0.945.10 ⁻³ Btu

Power

1 CV = 0.736	1 kW = 1.36 CV	1 kcal/h = 1.16 W	1 W = 0.860 kcal/h
1 Btu/h = 0.292 W	1 W = 3.42 Btu/h		

Temperature: conversion formulae

0 °C = 32 °F	0 °F = -17.8 °C
0 °F = (9/5) x °C	+32 °C = (5/9) x °F - 17.8

Temperature: conversion table

°F	°C	°F	°C	°F	°C	°F	°C
0	-17,8	30	-1,1	50	10,0	80	26,7
10	-12,2	32	0	60	15,6	90	32,2

Temperature: conversion table

°F	°C	°F	°C	°F	°C	°F	°C
20	-6,7	40	4,4	70	21,1	100	37,8

Energy

Energy

1 kcal/kg = 4.19.103 J/kg

1 J/kg = 0.239.10⁻³ kcal/kg

Heat transmission

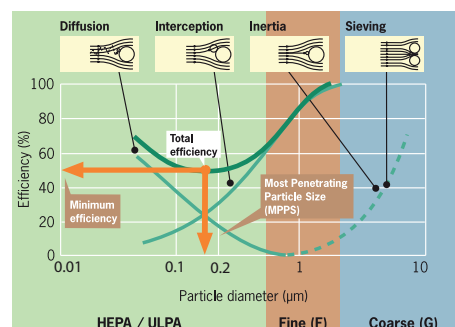
1 kcal/h.m².°C = 1.16 W/(m².°C) 1 W/(m².°C) = 0.86 kcal/h.m².°C

1 Btu/(h.ft².°F) = 5.64 W/(m².°C) 1 W/(m².°C) = 0.177 Btu/(h.ft².°F)

FILTER ENGINEERING - Theory

MPPS

Minimum efficiency of air filters



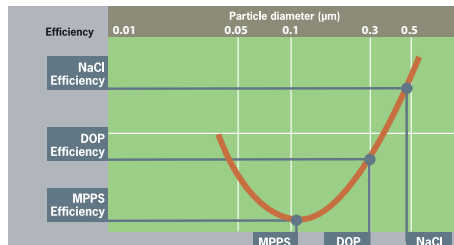
The overall efficiency of an air filter is the result of a combination of 4 basic filtration mechanisms (sieving, inertia, interception and diffusion), so that the efficiency curve of an air filter adopts a characteristic V shape showing a minimum level of efficiency. This minimum efficiency corresponds to a particle size called MPPS (Most Penetrating Particle Size). In other words, the MPPS is the particle size that is the most difficult to stop. The MPPS is situated between 0.1 and 0.2 μm depending on the filter type, and the speed of air flow through the filtering media

Standards, Regulations and Recommendations

EFFICIENCY TESTS (Not all the tests are equivalent)

Diagram of particle sizes

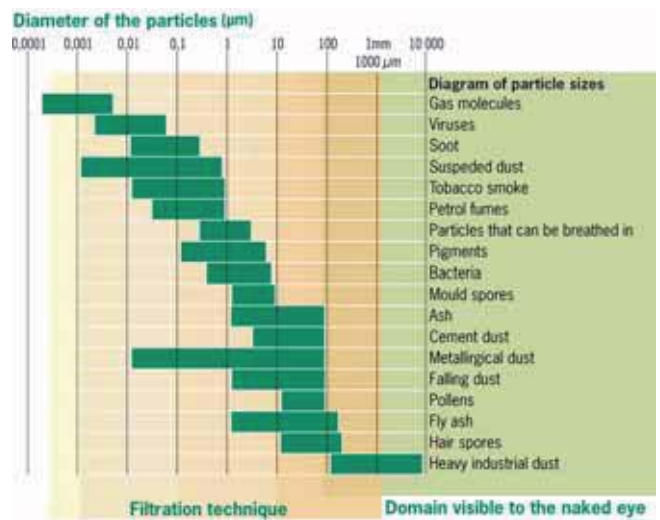
MPPS (Most Penetrating Particle Size)



The NaCl test (EUROVENT 4/4)

The NaCl test (EUROVENT 4/4) is less demanding than the DOP test, which in turn is less demanding than the MPPS test

particle sizes



Whitby diagram

Distribution of particles in atmospheric air

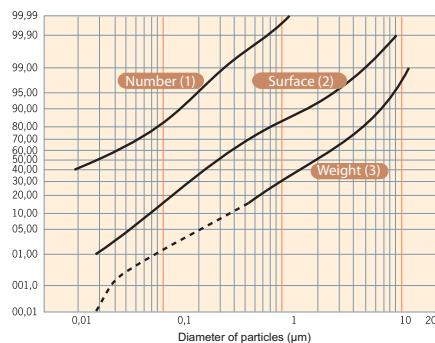


Diagram of Whitby: This diagram shows that more than 99.90% of airborne particles are less than or equal to 1 µm in size. Therefore, the essential part of air filtration's activity takes place in the invisible domain (human ocular partition power: 30 µm).

Filter Industry Definitions

μm	Micrometer or micron, one-millionth of a meter.
ACFM - Actual Cubic Feet Per Minute	This is a measure of airflow referenced to the current density of the gas. The mass flow rate of the air equals the ACFM multiplied by the air density.
Adsorption	Activated carbon is a porous, sponge-like substance which is capable of collecting and retaining many odor-bearing gas/vapor phase chemical compounds. The surface area of activated carbon is very large and consists of one surface layer and a submicroscopic pore structure. This pore structure is also known as the macropore and micropore wall surfaces. Molecules and atoms from the surrounding atmosphere are attracted and collected on these surfaces. The manufacture of an activated carbon is achieved by burning these submicroscopic holes into the carbon structure at 1000° C.
Aerosols	Solid and liquid airborne particles, typically ranging in size from 0.001 to 100 μm .
Approach Velocity	The actual velocity of the air as it approaches the filtration bank. Approach velocity can be determined by dividing the cfm of a system by the area of the filter bank opening. A 20,000 cfm system with a filter bank opening 10 feet high, by 10 feet wide (an area of 100 sq. ft.), would have an approach velocity of 200 feet per minute. $20,000 \text{ cfm} = 200 \text{ fpm} \times 100 \text{ sq.ft.}$
Arrestance	Gravimetric efficiency on an ASHRAE test dust that provides a value for a filter's ability to capture contaminant by weight. Has value when considered for filters in the MERV 1-4 range of ASHRAE Standard 52.2-2007.
Atmospheric Air Contaminants	Atmospheric air can be very dirty with concentrations of up to 10,000,000 particles per cubic foot, and rural areas are only about 50% better than industrialized cities. This equals 1 ton of settled contaminant per cubic mile, or 500 tons per square mile per year.
Bioaerosols	An airborne suspension of particles of biological origin.
Breakthrough Concentration	Saturation point of downstream contaminant buildup, which prevents the collection ability of a sorbent to protect against gases and vapors.
Brownian Motion or Movement	As particle sizes decrease below 0.3 micron, their movement in the air stream, both direction and velocity, are influenced more by collisions with the molecules that make up the fluid or air in which they are captive. These particles do not follow the trained arrows of the designers' drawings, but instead, move in an unpredictable, random direction, battered back and forth, in a vain attempt to follow the air stream itself. It is easy to imagine how a particle of sub-micron size can stay in suspension in a particular space indefinitely.
Bypass (Filter Bypass)	A reference to the unfiltered air going around the filter because it has not been properly sealed in place.
Capacity	The volume of air (cfm) which can be delivered through a filter unit.
Celsius (Centigrade)	A thermometric scale in which the freezing point of water is 00 and its boiling point is 1000 at normal atmospheric pressure (14.696 PSI).
cfm (cubic feet per minute)	A measure of the volume of air being used in a system. An air handling system rated at 20,000 CFM would have a volume of air equal to 20,000 cubic feet entering the plenum every minute. $\text{CFM} = \text{FPM} \times \text{Sq. Area}$.
Change of State	Change from one phase, such as solid, liquid, or gas, to another.
Chemisorption	Removal of gases from the airstream by the chemical reaction of the gas with an impregnant on the surface of, or distribute throughout the absorbant or carrier.
Chimney-Effect	The tendency of heated air to rise, due to lower density, in comparison with ambient, also called thermal updrafts. In clean room area, heat generating equipment may cause severe upward air currents, resulting in unwanted turbulence.
Cleanroom	A specially constructed, enclosed area environmentally controlled with respect to airborne particulate, temperature, humidity, air pressure, airflow patterns, air motion and lighting.
Clean Space	A term referring to cleanrooms or workstations within a room.
Collection Efficiency	Fraction of entering particles that are retained by the filter (based on particle count or mass).
Contaminants	Airborne dirt, dust, spores, viruses, bacteria, and allergens, which are sometimes referred to as aerosols. They may also be molecular in size and are then referred to as gaseous contaminants.
Conventional Flow (Non-Laminar Flow) Clean Room	A cleanroom with no requirements for uniform airflow patterns and air velocities.
Critical Surface	The surface in a cleanroom or workstation to be protected from particulate contamination.
Damper, Multiple Louver	A damper having a number of adjustable blades.
Δp - (Delta P)	A Greek symbol designating the difference in total air pressure between two points. Generally measured at the inlet and outlet of a filter. Normally measured in inches water gauge (in W.G.).
Depth Loading	Filtration accomplished by a progressively denser, deep medium designed to allow finer particles to penetrate further into the medium, while larger particulates are lodged closer to the surface. Progressive density medium has superior dust holding capability.
Diffuser	An air distribution outlet specifically designed to mix conditioned air with room air by induction. Mixing is accomplished by venturi action as the high velocity air stream leaving the diffuser aspirates ambient air toward the device.
Diffusion	A method of filtration that is effective on particles 0.1 micron and smaller. Their direction and velocity are influenced by molecular collisions (called "Brownian movement"). Particles of size do not follow the air stream but behave more like gases than particulate. Their dwell time in the media is longer, as they are battered across the direction of flow in a random "helter skelter" fashion. When a particle strikes a fiber, it is retained by the inherent adhesive forces between the particle and fiber (van der Waals forces).
Disposable	Refers to an expendable component or assembly which is discarded and replaced with a new unit when completely loaded.
D.O.P. (Dioctyl Phthalate)	An oil-like plasticizer which is readily atomized to form the 0.3 micron test aerosol used in overall penetration and scan tests of HEPA filters (extinct test).
Downstream	That portion of the system located after the filter. Also, the leaving air or the clean air side of a filter.
Dry Laid Media	Media fibers assembled in a media blanket, 1/8" to 3/8" thick.
Dust Holding Capacity	The total weight of ASHRAE test dust a filter can hold before reaching a given final resistance. The amount will vary depending on the size and design of the filter and airflow rate. Reported in grams, or grams per square foot. May provide a relative measure of filter service life in low efficiency filters.
Efficiency	In general terms, efficiency is the degree to which a filter will perform in removing solids. Specifically, it refers to any of three filter tests: ASHRAE 52-92 Arrestance, ASHRAE 52-92 Atmospheric Dust Spot, or DOP Penetration.

Filter Industry Definitions

Electret	Filter media to which an electrostatic charge is applied during its formation.
Electrostatic Filter	A filter that uses electrostatically enhanced fibers to attract and retain particles, usually decreases in efficiency over time.
Electrostatic Precipitation	A method of filtration that imparts a positive charge to airborne particulate matter and collects the particles on negatively charged collection plates.
E.T.L.	An independent testing laboratory for various types of air filters and equipment, now known as Intertek Testing.
Exfiltration	Air flow outward through a wall, leak membrane, etc.
Exhauster	A fan used to withdraw air under suction.
Extended Surface Filter	A category of filter that is designed with pleats or pockets to increase the amount of media exposed to the air stream within a given face dimension. Greater filter surface area reduces media velocity and increases efficiency, and dust holding capacity.
Fan	An air-moving device comprising a wheel or blade, and housing or orifice plate.
Fan, Centrifugal	A fan rotor, or wheel, within a scroll-type housing. It may be either belt drive or have a direct motor connection.
Fan Coil	A terminal unit consisting of a finned tube coil and a fan in a single enclosure
Fan Laws	Equations used to calculate fan flow, pressure, and power at different fan speeds, different air temperatures, and different air pressures.
Fan, Propeller	A propeller, or disc-type wheel, within a mounting ring or plate. It includes the driving mechanism supports for either belt drive or direct connection.
Fan, Tubeaxial	Propeller, or disc-type wheel, within a cylinder. It includes the driving mechanism supports for either belt drive or direct connection for moving air.
Face Area	The area of an air filter or other air treatment device normal to the flow of air through it.
Face Loading	The phenomenon by which contaminants in the air load up on the surface of the filter media, causing an abnormal rise in resistance.
Fan, Vaneaxial	A disc-type wheel within a cylinder, a set of air guide vanes located either before or after the wheel. It includes driving mechanism supports for either belt drive or direct connection.
Fiber Break-Off	Particles of the media fiber breaking off and entering the air stream, thereby becoming contaminants.
Fiberglass	A term used to describe filter medias made with coarse or fine glass fibers.
Filter Bypass	Airflow around a filter or through an unintended path.
Filter Face Velocity	Air stream velocity just prior to entering the filter.
Final Filters	The last and most effective filter in a multi-stage progressive filtration system.
Final Resistance	The maximum recommended pressure drop across a filter. Used as an indicator as to when a filter should be changed. Expressed in "inches w.g.", may or may not be synonymous with final pressure drop.
Filter	A term generally applied to a filter used to remove airborne particulate from the air. A filter may be one of many types, such as panel, automatic self-renewable, extended surface, HEPA, or electrostatic. The term "filter" is sometimes erroneously used to describe a media used inside the device.
Filter Media	Material that makes up the filter element. Glass, cotton, synthetic or cellulose fibers are examples of filter media types.
fpm (feet per minute)	The speed (velocity) of the air at a given point in the air handling system. $fpm = cfm \div \text{Area}$.
Fresh Air	Outdoor air introduced into a system.
Gas	Formless fluids which tend to occupy an entire space uniformly at ordinary temperatures.
Gas-Phase Filter	Composed of sorbent medium, e.g., natural zeolite, alumina-activated carbon, specialty carbons, synthetic zeolite, polymers.
Gel Seal	In cleanroom panels, the two compound silicone-sealing material in the downstream casing sides of knife-edge modules to effect a seal. Can be any color, but blue is the most popular.
HEPA	"High Efficiency Particulate Air" capable of removing a minimum of 99.97% of 0.3 micron DOP smoke particles from a test concentration of 80 micrograms per liter.
High Efficiency	Normally considered MERV 9 to MERV 15 (ASHRAE 52.2-2007).
Humidity	Water vapor within a given space.
Humidity, Relative	The ratio of the mole fraction of water vapor present in the air to the mole fraction of water vapor present in saturated air, at the same temperature and barometric pressure. Approximately, it equals the ratio of the partial pressure or density of the water vapor in the air to the saturation pressure or density, respectively, of water vapor at the same temperature.
Impingement	A method of filtration, effective on particles, with sufficient inertia to cause them to leave the air stream and collide with a fiber. Often referred to as viscous impingement, where fibers are coated with an adhesive.
Inch of Water	A unit pressure equal to the pressure exerted by a column of 1" high liquid water.
Inches - w.g.	Abbreviation for "inches - water column gauge". Method of reporting filter resistance (or pressure drop of a filter).
Infiltration	Air flowing inward through a wall, leak, etc.
Initial Resistance	Differential pressure across a clean filter. Expressed in inches W.G. Synonymous with initial pressure drop.
Interception	A special case of the impingement method of filtration that does not depend on the inertia of particles to bring them in contact with a fiber. Interception occurs when a particle follows the air stream, but touches a fiber as it attempts to flow around it. The particle is held by the inherent adhesive forces between the particle and fiber (van der Waals force).
Interstices	The points where two microfibers in filter media intersect.
Knife-Edge Seal	A narrow point where the peripheral sealing surface of a filter or filter frame provides a seal compression of a sharp edge into a gel.
Laminar Airflow	Airflow in parallel uniform lines, with uniform velocity and minimum eddies.
Laminar Flow Cleanroom	A cleanroom where a requirement for laminar airflow is usually 20 FPM.
Life Expectancy	The service life of changeout interval of a filter cartridge. Even with known dust holding capacity, the useful life will vary according to type and size of contaminants and particle distribution entering the filter on makeup air or 100% outside air systems.

Filter Industry Definitions

Life-Cycle Cost	Sum of all filter costs from initial investment to disposal and replacement, including energy and maintenance costs.
Loft	Thickness and surface irregularity of filter media.
Low Efficiency	Considered MERV 1 to MERV 5 (ASHRAE 52.2-2007). Examples: Coarse fiberglass media, layered metal screens, standard polyester, roll filters.
Makeup Air	Outside air introduced to the HVAC system for ventilation, pressurization, or to replace exhausted air quantities.
Mass Transfer Zone	Adsorbent bed depth required to reduce the chemical vapor challenge to the breakthrough concentration.
Maximum Allowable Resistance	Published final pressure drop by manufacturer.
Maximum Differential Pressure	The maximum pressure differential which a filter is required to withstand without structural failure or collapse.
Media	Plural of medium. Materials of which elements are made.
Media Velocity	Speed of air flowing perpendicular to media. Divide total cfm by total media area.
Medium	The porous material through which air is passed to remove particulates. Generally made of fiberglass, synthetic fibers or cellulose. Usually confined within a frame or cell sides, the assembly is referred to as a filter or filter cartridge.
MERV	Minimum Efficiency Reporting Value, a single number that designates an efficiency level when an HVAC level filter is tested using the practice defined in ASHRAE Standard 52.2, <i>Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size</i> . Values are MERV 1 through MERV 16. Filters higher than MERV 16 are HEPA filters and are evaluated through a practice prescribed by IEST.
MERV-A	A value, noted as MERV-A, that denotes an air filter's efficiency after an optional conditioning step, prescribed in Appendix J of ASHRAE 52.2. The step simulated how a filter may perform over its life within a system by simulating natural filter loading. A properly performing filter should have a MERV-A equivalent to its rated MERV.
Micron Or Micrometer Symbol - μ	A unit of length in the metric system equal to one millionth of a meter (0.000039 inches). Commonly used as a measure of particle size or fiber size in filter media. The naked eye can see a particle approximately 10 microns or larger.
Migration	The process by which the adhesive or oily substance releases itself from the media fibers, enters the air stream, and becomes a contaminant. Migration may cause clogged coils and dirty ducts as the oil collects in the system, often called entrainment.
Net Effective Media Area	The amount of media area in a filter that is exposed to airflow and usable for collecting airborne contaminants. Opposite of blind spots or dead area. Synonymous with net effective filtering area.
Non-Laminar	As applied to cleanroom airflow, this is less desirable than laminar flow because the air supply is introduced at random, causing turbulence and induction, which stir the airborne dust particles, keeping them in suspension.
Non-Supported Media	Filters in which the points are extended and supported in the air stream only by the airflow, with no separate media support.
Off-Gassing	Any toxic gas released by a product during operation or combustion.
Packing Density	Ratio of fiber volume to total filter volume.
Panel Filter	A low efficiency filter consisting of a flat sheet of media that is usually contained within a cardboard frame. An alternate design has an internal wire frame, normally made with fiberglass or synthetic media from ½ to 2 inches thick. Generally called throw-a-ways.
Particle Count	In a cleanroom, the quantities of airborne particulate at work levels are monitored periodically during operation. Particle populations per cubic foot are simultaneously recorded for .5 micron and larger sizes. The better particle counters will ingest one cubic foot per minute and record the results. Systematic particle counts are an important tool in maintaining any quality cleanroom.
Particle Size Efficiency	Descriptive value of filter performance, loading based upon specific particle sizes.
Particle Sizes of Contaminants	Average airborne atmospheric dust is approximately 1 - 10 microns; heavy atmospheric dust, such as fly ash, is 10-100 microns. One micron = 1/25,000 inch. A human hair is approximately 75-150 microns.
Particle Distribution of Atmospheric Air	98% of all particles are smaller than 10 microns (invisible to the human eye) when evaluating by count, and 94% of the total particles, by weight, are 10 microns and smaller. The majority of all particulate matter in a standard sample of atmospheric air, whether by weight or by count, are smaller than the eye can see, and are not trapped by low efficiency filters.
Penetration	The leak rate through the filter, penetration is expressed as a percentage based upon a specific particle size. % penetration is the reciprocal of % efficiency. HEPA filters, for example, have a .03% maximum penetration on 0.3-micron particles.
Phosphorous Free	Urethane sealant free of phosphorous components.
Physicochemical Properties	Physical and chemical characteristics of sorbents (pore size, shape, surface area, affinities, etc.). Characteristics of sorbent medium, e.g., pore size, shape, surface area, etc.
Pleated Panel Filter	An extended pleated media filter with media support wire grid and beverage board enclosing frame. The media is a blend of cotton and synthetic fibers, with an ASHRAE efficiency of 25-30%.
Prefilters	A filter placed in front of another filter to remove the larger, heavier particles. Primary purpose is to extend life of the final filters. Prefilters are highly recommended in systems requiring high efficiency filtration, especially where a high concentration of lint is present. Two stages of prefilters are recommended for cleanroom applications.
Pressure Differential/Drop	The difference in static pressure measured at two locations in a ventilation system, as referenced herein, the difference between the upstream and downstream side of the filter. Usually measured in inches of water, abbreviated as "w.g.".
Pressure, Static	The fan-induced pressure which tends to burst or collapse a duct, which is required to move air through a system. Fans must push and pull air to deliver against resistance from duct friction, filters, coils, and other airflow obstructions.
Pressure, Total	The combination of static pressure and velocity pressure within a duct.
Pressure, Velocity	The pressure required to maintain movement of air through a duct.
Rated Capacity	The air volume, usually specified in cfm, which a manufacturer specifies for a specific air filter.
Residence Time	Length of time that a hazardous agent spends in contact with a sorbent or within the capture zone of a filter.

Filter Industry Definitions

Return Air	Air which has been returned to the plenum from the building for recirculation. A return air duct will generally be found before the filter media where the return air is mixed with incoming fresh air. Also, referred to as RECIRCULATED AIR.
S.B.S. (Sick Building Syndrome)	Building related illness. Illness whose cause is related to conditions inside the building.
Scan Test	Technique for locating pinhole leaks or glue-line defects in HEPA filters by inspecting the entire leaving airside of the filter with an appropriate leak detector. Cold DOP with 0.5-micron diameter particles is used as the challenge aerosol. Cold DOP scan testing may be performed at the factory or on the job site.
Skin Loading	The condition occurring when collected particles build up on the surface of the media, plugging the spaces between fibers. Also known as blocking or surface loading. As a rule, the finer the media, the more susceptible it is to skin loading by "coarse" particles.
Sorbent	Porous medium that collects gases and vapors only.
Static Pressure	The potential pressure exerted in all directions by a fluid. For a fluid in motion, it is measured in the direction of flow.
Static Tip	Device inserted at right angles to an airstream to measure static pressure.
Steady State	A condition of equilibrium where all things are constant. Aerosol concentrations no longer change once steady-state occurs.
Stoke's Law	A physical law which approximates the velocity of a particle falling under the action of gravity through a fluid. The particles will accelerate until the frictional drag of the fluid just balances the gravitational acceleration, after which, it will continue to fall at a constant velocity, known as the terminal or free-settling velocity.
Straining	A method of filtration that removes larger particles. Straining occurs when a particle is larger than the space between fibers and cannot pass through them.
SULPA	Super low penetrating air (filter) with 99.9999% efficiency on 0.12-micron particles.
Supported Media	Filters in which the pleats are supported and separated their full length.
Surface Area (Carbon)	The surface area of granulated activated carbon is determined by the BET method, which utilizes the adsorption of nitrogen at liquid nitrogen temperatures in the calculation. Surface area is usually expressed in square meters per gram of carbon.
Tackifier Migration	The process by which the adhesive or oily substance releases itself from the media fibers, enters the airstream, and becomes a contaminant. Migration may cause clogged coils and dirty ducts as the adhesive or oil collects in the system.
Terminal Module	A sealed, mounted, ducted HEPA filter - not room side replaceable.
Ton of Refrigeration	A useful refrigerating effect equal to 3516 watts (12,000 BTUH).
Total Pressure	Total pressure is the sum of static and velocity pressure. Not including temperature changes, it is the sum energy potential of liquid or gas.
UL Ratings	Smoke contribution ratings applied to filters by UL test standard 900 (Underwriters Laboratories).
ULPA	Ultra low penetration air (filter) with efficiency of 99.9995% on 0.12 micron particles.
Unloading	The process by which dirt, originally stopped by the filter, is released back into the air stream.
Vapor	The gaseous form of substances that are normally solid or liquid at ambient temperatures.
Vapor Pressure	Partial pressure of a liquid's vapor required to maintain the vapor in equilibrium with the condensed liquid or solid.
Velocity Pressure	Velocity pressure is the energy associated with a liquid or gas, based upon its velocity and density. Velocity pressure is proportional to the square of velocity. It is akin to the kinetic energy of a system.
Ventilation	The process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.
V.O.C.'S	Volatile organic components from a variety of furniture finishes, carpets or drapes, cleaning and personal products, that evaporate at room temperatures.
w.g.	See inches water gauge.
Wet-Laid Media	An ultra-fine fiberglass media "paper" used in most mini-pleat filters and all current HEPA types.

Summary Pre-Filtration, Class G3 to M5



Media Rolls
Media Rolls - Filter class G3
to M5
Page 46



Media Rolls
Cam Glass Media
Page 47



Fan Coil Filters
Fan Coil Filter
Page 48



Media Holding Frame (MHF)
Media Holding Frame (MHF)
Page 49



Pleated Panel Filters
AeroPleat® III
Page 50



Pleated Panel Filters
30/30®
Page 51



Pleated Panel Filters
AP Eleven
Page 52



Pleated Panel Filters
30/30® WR
Page 53



Primary Bag Filters
Hi-Cap®
Page 54

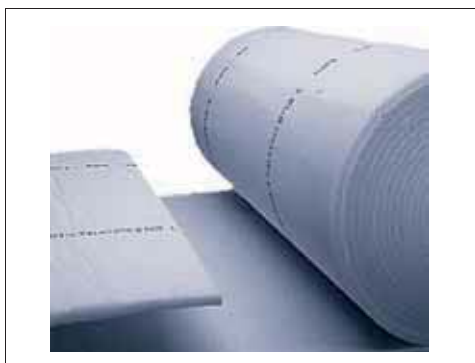


Primary Bag Filters
Hi-Cap® XLS
Page 55



Metal Filters
ECO® Moisture Separator
Page 56

Media Rolls - Filter class G3 to M5



Advantages

- **CM:**
 - Smooth airflow through paint booths
 - Progressively built up thermal bonded polyester fibre
- **CDM 600:**
 - Thermal bonded polyester fibre
 - Enhances laminar air flow patterns
 - Treated with special adhesive to prevent dust loss due to vibration

Application: CM: For use as a prefilter in air conditioning, and spraybooth ventilation
CDM: For fine filtration in air conditioning devices and installations, particularly final filtration in Automotive spraybooths and drying cabinets.

Media: CM: Synthetic, CDM: Polyester fibre.

EN779:2012 filter class: G3, G4, M5.

ASHRAE 52.2:2007 filter class: MERV 6, MERV 7, MERV 10.

Arrestance efficiency: 85% - 92% for CM, 95% for CDM.

Temperature: 80°C - 100°C maximum in continuous service.

Fire rating: DIN 53438 class F1 for CM, UL 900 for CDM.

Reference	Model	Dimensions (m)	Filter classification EN779:2012	Pressure drop at 1m/s velocity Pa	Unit volume m ³
5200003	CM355	2 X 20	G3	1.0/30	0.4
5200006	CM360	2 X 20	G4	1.0/45	0.4
5200013	Camtex CDM600	2.0 x 20	M5	1.0/85	0.8
5200015	Camtex CDM600	1.7 x 20	M5	1.0/85	0.7

Cam Glass Media



Advantages

- Continuous filament glass fibres, resin bonded
- Smooth airflow through paint booths
- Full depth particle collection
- Economical

Application: For use as a prefilter in air conditioning, and spraybooth extract systems.

Media: Glass Fibre.

EN779:2012 filter class: G3.

ASHRAE 52.2:2007 filter class: MERV 6.

Arrestance efficiency: 85%.

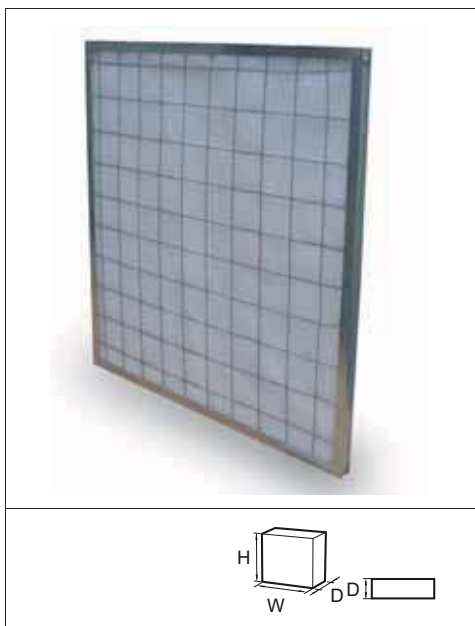
Recommended final pressure drop: 200 Pa.

Temperature: 120°C maximum in continuous service.

Fire rating: DIN 53438 class F1.

Reference	Model	Dimensions (m)	Filter classification EN779:2012	Pressure drop at 1m/s velocity Pa	Unit volume m ³
5200012	Paintstop rolls	1 X 20	G3	1.0/10	0.20

Fan Coil Filter



Advantages

- Protection via 2 grids
- Ultra compact
- Progressively built-up thermal bonded polyester fibre

Application: Prevention of dust and dirt build up on heating/cooling coils within ventilation systems.

Type: Prefilter.

Frame: Mill-finished aluminium profile.

Media: Polyester fibre.

EN779:2012 filter class: G3, G4.

ASHRAE 52.2:2007 filter class: MERV 6, MERV 7.

Recommended final pressure drop: 250 Pa.

Temperature: 80°C - 100°C maximum in continuous service.

Holding frame: Type 8.

Fire rating: DIN 53438 class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air Flow / Pressure drop m ³ /hr/Pa	Unit weight kg	Unit Volume m ³
5404501	FCF 24x24x1-G3	597x597x22	G3	0.356	3400/115	0.735	0.01
5404511	FCF 24x12x1-G3	292x597x22	G3	0.174	1700/144	0.43	0.005
5404001	FCF 24x24x1-G4	597x597x22	G4	0.356	3400/140	0.77	0.01
5404002	FCF 24x12x1-G4	292x597x22	G4	0.174	1700/190	0.46	0.005

Media Holding Frame (MHF)



Advantages

- Suitable for high humidity conditions
- Progressively built-up thermal bonded polyester fibre
- Replaceable filter media

Application: Prefiltration of dust and dirt on air handling units.

Type: Nonwoven media, pleated with a wire support grid.

Frame: Mill-finished aluminium profile.

Media: Polyester fibre.

EN779:2012 filter class: G3, G4.

ASHRAE 52.2:2007 filter class: MERV 6, MERV 7.

Recommended final pressure drop: 250 Pa.

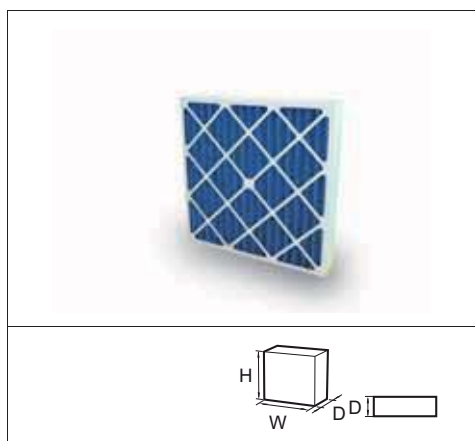
Temperature: 80°C - 100°C.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: DIN 53438 class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
5402501	MHF 24x24x2-G3	594 x 594 x 46	G3	0.57	3400/100	1.35	0.018
5402502	MHF 12x24x2-G3	289 x 594 x 46	G3	0.3	1700/145	0.77	0.009
5402001	MHF 24x24x2-G4	594 x 594 x 46	G4	0.57	3400/110	1.35	0.018
5402002	MHF 12x24x2-G4	289 x 594 x 46	G4	0.3	1700/160	0.77	0.009

AeroPleat® III



Advantages

- Moisture resistant cardboard frame
- Robust construction
- Comprehensive range of standard and non standard sizes
- Fully supported media bonded onto a wire support grid
- Bonded into case to eliminate air by-pass

Application: Prefilter for comfort air conditioning applications.

Type: Disposable pleated panel filter.

Frame: Moisture resistant cardboard.

Media: Mixture of cotton and synthetic fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 8.

Recommended final pressure drop: 250 Pa.

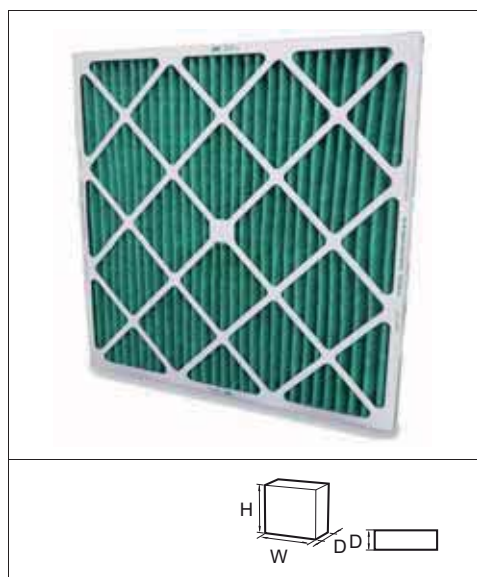
Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
116300001	Aeropleat III 20x16x2	394 x 495 x 44	G4	0.60	1887/70	0.4	0.01
116300002	Aeropleat III 20x20x2	495 x 495 x 44	G4	0.80	2363/70	0.5	0.01
116300003	Aeropleat III 25x20x2	495 x 622 x 44	G4	1.00	2950/70	0.6	0.01
116300004	Aeropleat III 25x16x2	394 x 622 x 44	G4	0.73	2363/70	0.5	0.01
116300005	Aeropleat III 24x24x2	594 x 594 x 44	G4	1.13	3400/70	0.65	0.02
116300006	Aeropleat III 24x12x2	289 x 594 x 44	G4	0.57	1656/70	0.35	0.01
116300007	Aeropleat III 24x20x2	495 x 594 x 44	G4	0.96	2839/70	0.55	0.01
116300008	Aeropleat III 24x18x2	444 x 594 x 44	G4	0.85	2550/70	0.5	0.01
116307001	Aeropleat III 24x24x4	594 x 594 x 95	G4	2.11	3400/50	1.2	0.03
116307002	Aeropleat III 24x12x4	289 x 594 x 95	G4	1.05	1700/50	0.65	0.03
116307003	Aeropleat III 20x20x4	492 x 492 x 95	G4	1.46	2363/50	0.9	0.02
116307004	Aeropleat III 20x16x4	390 x 492 x 95	G4	1.17	1887/50	0.75	0.02
116307005	Aeropleat III 25x16x4	390 x 619 x 95	G4	1.46	2363/50	0.9	0.03
116307007	Aeropleat III 24x20x4	492x 594 x 95	G4	1.76	2839/50	1.05	0.03

30/30®



Advantages

- High mechanical strength
- Fully supported media bonded onto a wire support grid
- Rigid, water resistant cardboard frame
- Large media surface
- Unique radial pleat design
- Media bonded into frame to eliminate air bypass

Application: Primary filter for air conditioning systems.

Type: High performance disposable pleated panel filter.

Frame: Rigid water resistant cardboard.

Media: Mixture of cotton and synthetic fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 8.

Recommended final pressure drop: 250 Pa.

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
54862001	30/30 20x16x1	394x495x22	G4	0.50	1326/55	0.3	0.006
54862002	30/30 20x20x1	495x495x22	G4	0.61	1649/55	0.4	0.007
54862003	30/30 25x20x1	495x622x22	G4	0.74	2066/55	0.55	0.008
54862004	30/30 25x16x1	394x622x22	G4	0.62	1649/55	0.42	0.007
54862005	30/30 24x24x1	597x597x22	G4	0.91	2380/55	0.6	0.010
54862010	30/30 24x12x1	292x597x22	G4	0.46	1190/55	0.3	0.005
54862011	30/30 24x20x1	495x597x22	G4	0.74	1981/55	0.53	0.008
49880001	30/30 20x16x2	394x495x44	G4	0.92	1870/75	0.44	0.011
49880002	30/30 20x20x2	495x495x44	G4	1.11	2363/75	0.55	0.013
49880003	30/30 25x20x2	495x622x44	G4	1.39	2958/75	0.7	0.017
49880004	30/30 25x16x2	394x622x44	G4	1.15	2363/75	0.55	0.014
49880005	30/30 24x24x2	594x594x44	G4	1.61	3400/75	0.78	0.019
49880006	30/30 24x12x2	289x594x44	G4	0.78	1700/75	0.4	0.010
49880009	30/30 20x14x2	343x495x44	G4	0.77	1658/75	0.25	0.010
49880012	30/30 24x20x2	495x594x44	G4	1.33	2839/75	0.45	0.016
49880015	30/30 24x18x2	444x594x44	G4	1.21	2550/75	0.45	0.014
49880017	30/30 24x16x2	394x594x44	G4	1.10	2270/75	0.55	0.014
59413001	30/30 24x24x4	594x594x95	G4	2.58	3400/65	1.45	0.039
59413002	30/30 24x12x4	289x594x95	G4	1.29	1700/65	0.6	0.019
59413003	30/30 20x20x4	492x492x95	G4	1.76	2363/65	0.3	0.027
59413004	30/30 20x16x4	390x492x95	G4	1.46	1870/65	0.25	0.022
59413005	30/30 25x16x4	390x619x95	G4	1.83	2363/65	0.25	0.027
59413006	30/30 25x20x4	492x619x95	G4	2.19	2958/65	0.45	0.033
59413008	30/30 24x20x4	492x594x95	G4	2.11	2839/65	0.45	0.031
59413010	30/30 25x25x4	619x619x95	G4	2.79	3689/65	0.5	0.044

AP Eleven



Advantages

- Lowest cost of ownership for a M5 filter in a pleated panel design
- High wet-strength beverage board frame
- High capacity dust loading for a longer life than standard pleated filters
- Available in 2" and 4" depths

Description: High efficiency M5 pleated panel filter.

Typical applications: Prefilters to higher efficiency filters, stand-alone filter for rooftops, split systems, free-standing units and package systems and air handlers.

EN779:2012 filter class: M5.

ASHRAE 52.2:2007 filter class: MERV 11.

Media: Synthetic fibers in a uniform lofted media blanket.

Recommended final pressure drop: 250Pa.

Temperature: Maximum continuous operating temperature of 70° C.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
404434001	AP Eleven 20x16x2	394x495x44	M5	0.910	1887/60	0.44	0.01
404434002	AP Eleven 20x20x2	495x495x44	M5	1.087	2363/60	0.49	0.01
404434003	AP Eleven 25x20x2	495x622x44	M5	1.366	2958/60	0.63	0.01
404434004	AP Eleven 25x16x2	394x622x44	M5	1.143	2363/60	0.49	0.01
404434005	AP Eleven 24x24x2	594x594x44	M5	1.607	3400/60	0.68	0.02
404434006	AP Eleven 24x12x2	289x594x44	M5	0.771	1700/60	0.40	0.01
404434007	AP Eleven 24x20x2	495x594x44	M5	1.310	2839/60	0.58	0.01
404434008	AP Eleven 24x18x2	444x594x44	M5	1.198	2550/60	0.54	0.01
404435001	AP Eleven 24x24x4	594x594x95	M5	2.555	3400/55	1.25	0.03
404435002	AP Eleven 24x12x4	289x594x95	M5	1.282	1700/55	0.67	0.02
404435003	AP Eleven 20x20x4	492x492x95	M5	1.747	2363/55	0.87	0.02
404435004	AP Eleven 20x16x4	390x492x95	M5	1.449	1887/55	0.69	0.02
404435005	AP Eleven 25x16x4	394x622x95	M5	1.814	2363/55	0.91	0.02
404435006	AP Eleven 25x20x4	495x622x95	M5	2.183	2958/55	1.1	0.03
404435007	AP Eleven 24x20x4	492x594x95	M5	2.093	2839/55	1.04	0.03

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

30/30® WR



Advantages

- Two-in-one performance - keeps out water and dirt.
- A multi-layered non-cellulose media, repels water, captures dust, lint, pollen and other particulate contaminants.
- Media bonded to the frame to eliminate air bypass
- Water resistant beverage board frame
- Large media surface

Applications: Primary filter for medium efficiency applications.

Type: High performance pleated panel filter.

Frame: High strength moisture resistant beverage board.

Media: Glass fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

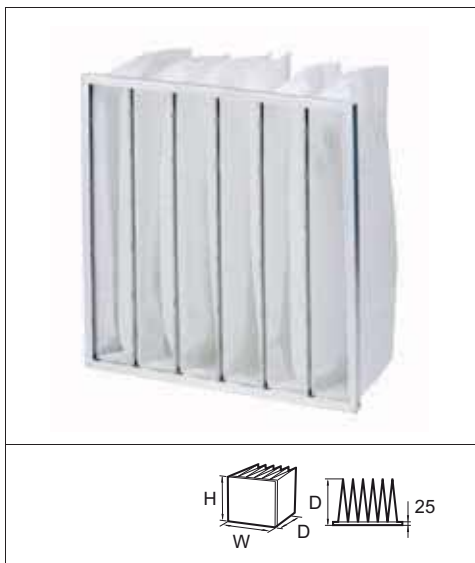
Recommended final pressure drop: 250 Pa.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / pressure drop m³/hr/Pa	Unit volume m³
125343005	30/30 WR 24x24x2	595x595x44	G4	2.61	3400/60	0.02
125343006	30/30 WR 24x12x2	289x595x44	G4	1.27	1700/60	0.01
402137001	30/30 WR 24x24x4	595x595x95	G4	4.24	3400/55	0.03
402137002	30/30 WR 24x12x4	289x595x95	G4	4.24	1700/55	0.02

Hi-Cap®



Advantages

- Rigid self supporting pockets
- Robust metal header frame
- High mechanical strength
- Welded pocket construction
- High dust holding capacity

Application: Comfort air conditioning applications, prefilter applications.

Type: Multi pocket bag filter.

Case: Galvanised steel.

Media: Polyester fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

Recommended final pressure drop: 250 Pa.

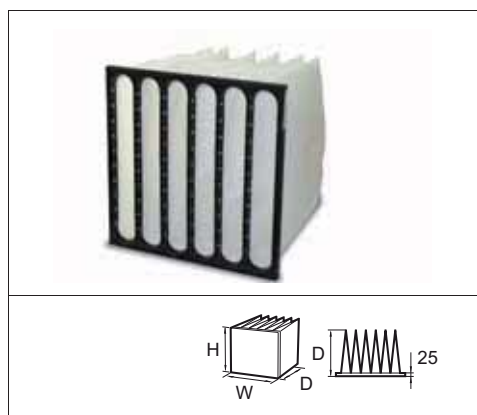
Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: DIN 53438 class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of pockets	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3200005	HF 90/35-66	592 x 592 x 360	G4	6	2.6	3400/50	2.2	0.04
3200006	HF 90/35-56	490 x 592 x 360	G4	5	2.2	2800/50	2	0.04
3200007	HF 90/35-36	287 x 592 x 360	G4	3	1.3	1700/50	1.4	0.02
3200008	HF 90/35-55	490 x 490 x 360	G4	5	1.8	2334/50	1.7	0.04
3202009	HF 90/35- 592*592-6*580-66	592 x 592 x 580	G4	6	4.2	3400/30	2.6	0.04
3202033	HF 90/35- 490*592-5*580-66	490 x 592 x 580	G4	5	3.5	2800/30	2.2	0.04
3202016	HF 90/35-287*592-3*580-36	287 x 592 x 580	G4	3	2.0	1700/30	1.5	0.03

Hi-Cap® XLS



Advantages

- Rigid self supporting pockets
- Robust plastic header frame
- High mechanical strength
- Welded pocket construction
- High dust holding capacity
- No metal parts

Application: Comfort air conditioning applications.

Type: Multi pocket bag filter.

Header frame: Plastic.

Media: Polyester fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

Recommended final pressure drop: 250 Pa.

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Reference	Model	Dimensions(WxHxD) mm	Filter classification EN779:2012	Number of pockets	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3204001	HF Green 90/35-66	592 x 592 x 360	G4	6	2.6	3400/50	2.2	0.04
3204002	HF Green 90/35-56	490 x 592 x 360	G4	5	2.2	2800/50	2	0.04
3204003	HF Green 90/35-36	287 x 592 x 360	G4	3	1.3	1700/50	1.4	0.02

ECO®Moisture Separator



Advantages

- Pre-drilled weeping holes for drainage or reclaim of valuable process oils
- Optional coalescer pad available for increased efficiency

Description: Cleanable, all-metal panel filter designed specifically for the removal of airborne moisture droplets.

Typical applications: High moisture situations in commercial or industrial processes, or oil-laden industrial applications. Includes weeping holes for drainage or reclaim of airborne oil or mists.

Efficiency: 98%+ on droplets 20 microns and larger.

Media: Alternate layers of flat and serpentine crimped galvanized screen.

Recommended final pressure drop: 250 Pa when operated at 2.5 m/s. System design may dictate alternative changeout point.

Airflow operating range: Velocity of 2.25 m/s to 2.75 m/s, consult factory outside of this range.

Ratings: N/A

Part Number	Application	Nominal Size (H x W x D) mm	Actual Height mm	Actual Width mm	Rated Airflow m/s	Weight kg
Galvanized Steel						
064649-001	For built-up banks	594 x 594 x 95	593.85	593.85	3400	8.6
064649-002	For built-up banks	594 x 289 x 95	593.85	289.05	1700	4.5
064649-003	For built-up banks	289 x 594 x 95	289.05	593.85	1700	4.5
064649-004	For side access housings(includes sealing gasket on vertical side)	594 x 594 x 95	593.85	593.85	3400	8.6
064649-005	For side access housings(includes sealing gasket on vertical side)	594 x 289 x 95	593.85	289.05	1700	4.5
064649-006	For side access housings(includes sealing gasket on vertical side)	289 x 594 x 95	289.05	593.85	1700	4.5
Stainless Steel						
098512-001	For built-up banks	594 x 594 x 95	593.85	593.85	3400	8.6
098512-002	For built-up banks	289 x 594 x 95	289.05	593.85	1700	4.5
098512-003	For built-up banks	594 x 289 x 95	593.85	289.05	1700	4.5
098512-004	For side access housings(includes sealing gasket on vertical side)	594 x 594 x 95	593.85	593.85	3400	8.6
098512-005	For side access housings(includes sealing gasket on vertical side)	289 x 594 x 95	289.05	593.85	1700	4.5
098512-006	For side access housings(includes sealing gasket on vertical side)	594 x 289 x 95	593.85	289.05	1700	4.5

Summary Bag and Compact Filters, Class M5 to F9



Bag Filters Glass Fibre
Hi-Flo XLT
Page 58



Bag Filters Glass Fibre
Hi-Flo® M-Series
Page 59



Bag Filters Glass Fibre
Hi-Flo® P-Series
Page 60



Bag Filters Glass Fibre
Hi-Flo® U-Series
Page 61



Bag Filters Glass Fibre
Hi-Flo® A-Series
Page 62



Bag Filters Glass Fibre
Hi-Flo® T-Series
Page 63



Bag Filters Synthetic Media
S-Flo P Series
Page 64



Bag Filters Synthetic Media
S-Flo U Series
Page 65



Bag Filters Synthetic Media
S-Flo A Series
Page 66



Compact Filter
Opakfil Start
Page 67



Compact Filter
Opakfil Green
Page 68



Compact Filter
Opakfil CC
Page 69



Compact Filter
Durafil® ES
Page 70



Compact Filter
Durafil® ESB
Page 71



High Efficiency Panel
OpakAir
Page 72



High Efficiency Panel
Airopac® 3GGM
Page 73



High Efficiency Panel
Airopac® 3GGMHF
Page 74



High Efficiency Panel
EcoPleat Green
Page 75



Pleated Compact Filter
Airopac® Green
Page 76



Pleated Compact Filter
Riga-Flo
Page 77



Pleated Compact Filter
Riga-Flo P
Page 78

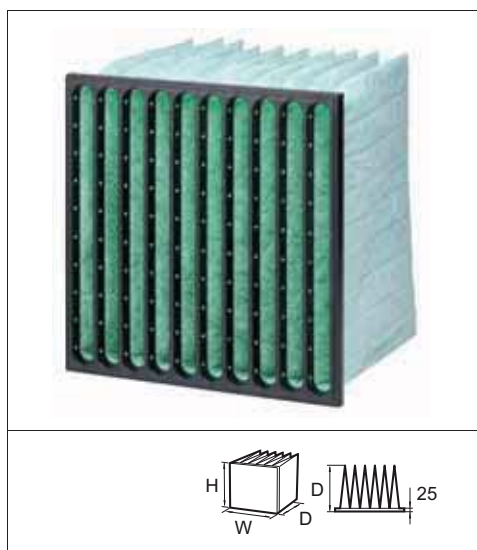


Pleated Compact Filter
3CPM Aeropac
Page 79



Pleated Compact Filter
3HCP8 Aeropac
Page 80

Hi-Flo XLT



Advantages

- The latest developed glass fibre media
- Low initial pressure drop
- Flat pressure drop curve
- New developed pocket design for the best air distribution
- Conical pockets
- Moulded, rigid and aerodynamic shaped plastic frame
- Less energy consumption
- Energy A rating according to Eurovent 4/11

Application: Air conditioning applications and as pre filters for clean rooms

Type: Pocket filters with high efficiency

Frame: PS plastic - moulded and combustible

Media: Glass fiber

EN779:2012 efficiency: F7, F9.

Temperature: 70°C maximum in continuous service.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa)

Air flow: Nominal air flow $\pm 25\%$

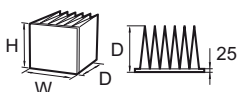
Packing: Environmental friendly cardboard boxes easy to carry.

Holding frames: Mounting frames in type SP or in filter housing FCB-HF

Type	Width	Height	Depth	Filter class	Air flow m ³ /h	Pressure drop	Bags	Area m ²	Volume m ³	Weight kg
7 A50+	592	592	640	F7	3400	75	10	7,5	0,04	2,3
7 A50+	490	592	640	F7	2700	75	8	6	0,04	1,6
7 A50+	287	592	640	F7	1700	75	5	3,7	0,03	1,4
7 A50+	287	287	640	F7	800	75	5	1,9	0,01	0,8
7 A50+	592	287	640	F7	1700	75	10	3,7	0,03	1,4
7 A50+	592	490	640	F7	2700	75	10	6,2	0,04	1,6
7 A50+	490	490	640	F7	2330	75	8	5	0,04	1,3
7 A50+	592	592	520	F7	3400	90	10	6,1	0,04	2,2
7 A50+	490	592	520	F7	2700	90	8	4,9	0,04	1,4
7 A50+	287	592	520	F7	1700	90	5	3	0,03	1,3
7 A50+	287	287	520	F7	800	90	5	1,5	0,01	0,7
7 A50+	592	287	520	F7	1700	90	10	3	0,03	1,3
7 A50+	592	490	520	F7	2700	90	10	5	0,04	1,4
7 A50+	490	490	520	F7	2330	90	8	4	0,04	1,2
9 A80+	592	592	640	F9	3400	150	10	7,5	0,04	1,6
9 A80+	490	592	640	F9	2700	150	8	6	0,04	1,6
9 A80+	287	592	640	F9	1700	150	5	3,7	0,03	1,4
9 A80+	287	287	640	F9	800	150	5	1,9	0,01	0,8
9 A80+	592	287	640	F9	1700	150	10	3,7	0,03	1,4
9 A80+	592	490	640	F9	2700	150	10	6,2	0,04	1,6
9 A80+	490	490	640	F9	2330	150	8	5	0,04	1,3

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Hi-Flo® M-Series



Advantages

- Large surface area
- Saves energy - optimised design (LCC)
- Comprehensive range of standard sizes
- Controlled media spacing (CMS)
- Certified performance

Application: Air conditioning applications.

Type: Extended surface multi pocket bag filter.

Frame: Galvanised steel.

Media: Glass fibre.

EN779:2012 filter class: M6, F7, F8, F9.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14, MERV 15.

Recommended final pressure drop: 450 Pa (suggested economical change point 250Pa).

Temperature: 70°C maximum in continuous service.

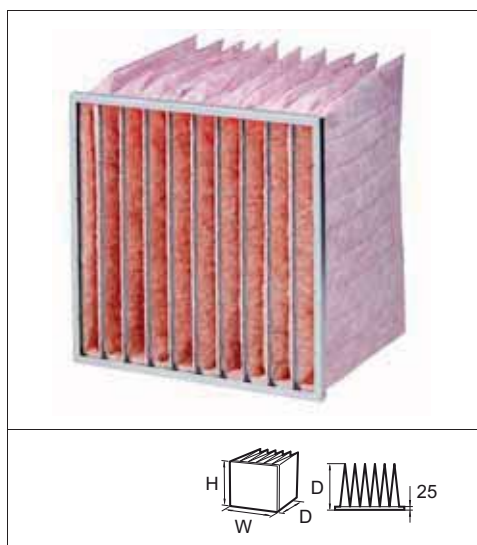
Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of Pockets	Media area m ²	Airflow/pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
3100001	M6	592 x 592 x 635	M6	12	9	3400/65	3.30	0.05
3100002	N6	490 x 592 x 635	M6	10	7.4	2800/65	3.00	0.03
3100003	O6	287 x 592 x 635	M6	6	4.6	1700/65	2.00	0.05
3100029	M7	592 x 592 x 635	F7	12	9	3400/85	3.30	0.05
3100030	N7	490 x 592 x 635	F7	10	7.4	2800/85	3.00	0.05
3100031	O7	287 x 592 x 635	F7	6	4.5	1700/85	2.00	0.03
3100057	M8	592 x 592 x 635	F8	12	9	3400/130	3.30	0.05
3100058	N8	490 x 592 x 635	F8	10	7.4	2800/130	3.00	0.05
3100059	O8	287 x 592 x 635	F8	6	4.6	1700/130	1.80	0.03
3105006	M9	592 x 592 x 635	F9	12	9	3400/130	3.30	0.05
3105009	N9	490 x 592 x 635	F9	10	7.4	2800/130	3.00	0.05
3105007	O9	287 x 592 x 635	F9	6	4.6	1700/130	1.80	0.03

* 20mm header frame is available on request.

Hi-Flo® P-Series



Advantages

- Large surface area
- Low pressure drop
- Comprehensive range of standard sizes
- Controlled media spacing (CMS)
- Certified performance

Application: Air conditioning applications.

Type: Extended surface multi pocket bag filter.

Frame: Galvanised steel.

Media: Glass fibre.

EN779:2012 efficiency: M6, F7, F8, F9.

ASHRAE 52.2:2007 efficiency: MERV 11, MERV 13, MERV 14, MERV 15.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

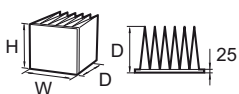
Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of Pockets	Media area m²	Airflow/pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3100009	P6	592 x 592 x 534	M6	10	6.5	3400/70	2.9	0.05
3100010	Q6	490 x 592 x 534	M6	8	5.2	2800/70	2.4	0.05
3100011	R6	287 x 592 x 534	M6	5	3.3	1700/70	1.5	0.03
3100037	P7	592 x 592 x 534	F7	10	6.5	3400/105	2.6	0.05
3100038	Q7	490 x 592 x 534	F7	8	5.2	2800/105	2.4	0.05
3100039	R7	287 x 592 x 534	F7	5	3.3	1700/105	1.6	0.03
3100065	P8	592 x 592 x 534	F8	10	6.5	3400/150	2.4	0.05
3100066	Q8	490 x 592 x 534	F8	8	5.2	2800/145	2.4	0.05
3100067	R8	287 x 592 x 534	F8	5	3.3	1700/140	1.5	0.03
3105008	P9	592 x 592 x 534	F9	10	6.5	3400/150	2.4	0.05
3105010	Q9	490 x 592 x 534	F9	8	5.2	2800/145	2.4	0.05
3105011	R9	287 x 592 x 534	F9	5	3.3	1700/140	1.5	0.03

* 20mm header frame is available on request.

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Hi-Flo® U-Series



Advantages

- Large surface area
- Comprehensive range of standard sizes
- Controlled media spacing (CMS)
- High dust holding capacity
- Robust construction
- Certified performance

Application: Comfort air conditioning applications, prefilter applications.

Type: Multi pocket bag filter.

Case: Galvanised steel.

Media: Glass fibre.

EN779:2012 filter class: M6, F7, F8, F9.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14, MERV 15.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

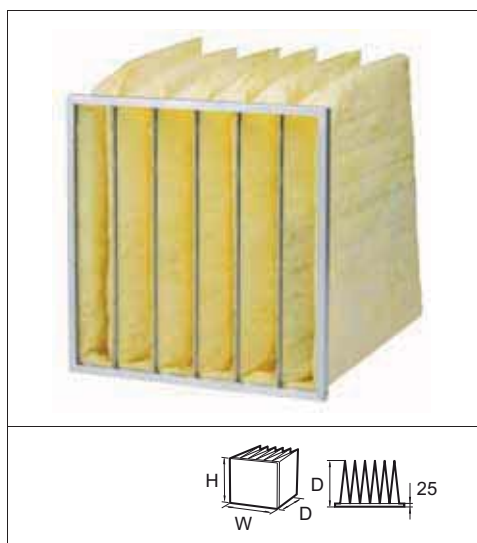
Holding frames: Front and side access housings and frames are available, Type 8, and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of pockets	Media area m²	Airflow/pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3100013	UM6	592 x 592 x 600	M6	8	6	3400/70	2.9	0.05
3100014	UG6	490 x 592 x 600	M6	6	4.5	2800/70	2.4	0.05
3100015	UH6	287 x 592 x 600	M6	4	3	1700/70	1.5	0.03
3100016	3UF6	490 x 490 x 600	M6	6	3.6	2334/70	2	0.05
3100041	UF7	592 x 592 x 600	F7	8	6	3400/115	2.9	0.05
3100042	UG7	490 x 592 x 600	F7	6	4.5	2800/115	2.4	0.05
3100043	UH7	287 x 592 x 600	F7	4	3	1700/115	1.5	0.03
3100044	3UF7	490 x 490 x 600	F7	6	3.6	2334/115	2	0.05
3100069	UF8	592 x 592 x 600	F8	8	6	3400/145	2.9	0.05
3100070	UG8	490 x 592 x 600	F8	6	4.5	2800/145	2.4	0.05
3100071	UH8	287 x 592 x 600	F8	4	3	1700/145	1.5	0.03
3100072	3UF8	490 x 490 x 600	F8	6	3.6	2334/145	2	0.05
3105012	UF9	592 x 592 x 600	F9	8	6	3400/145	2.9	0.05
3105013	UG9	490 x 592 x 600	F9	6	4.5	2800/145	2.4	0.05
3105014	UH9	287 x 592 x 600	F9	4	3	1700/145	1.5	0.03
3105015	3UF9	490 x 490 x 600	F9	6	3.6	2334/145	2	0.05

* 20mm header frame is available on request.

Hi-Flo® A-Series



Advantages

- Comprehensive range of standard sizes
- Robust construction
- Controlled media spacing (CMS)
- High dust holding capacity

Application: Comfort air conditioning applications, prefilter applications.

Type: Multi pocket bag filter.

Frame: Galvanised steel.

Media: Glass fibre.

EN779:2012 filter class: M5, M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 10, MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

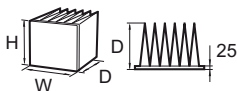
Holding frames: Front and side access housings and frames are available, Type 8, and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of pockets	Media area m²	Airflow/pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3100085	A5	592 x 592 x 600	M5	6	4.5	3400/55	2.4	0.05
3100086	B5	490 x 592 x 600	M5	5	3.6	2800/55	2.1	0.05
3100087	C5	287 x 592 x 600	M5	3	2.3	1700/55	1.5	0.03
3100017	A6	592 x 592 x 600	M6	6	4.5	3400/80	2.4	0.05
3100018	B6	490 x 592 x 600	M6	5	3.6	2800/85	2.1	0.05
3100019	C6	287 x 592 x 600	M6	3	2.3	1700/80	1.5	0.03
3100045	A7	592 x 592 x 600	F7	6	4.5	3400/150	2.4	0.05
3100046	B7	490 x 592 x 600	F7	5	3.6	2800/155	2.1	0.05
3100047	C7	287 x 592 x 600	F7	3	2.3	1700/150	1.5	0.03
3100073	A8	592 x 592 x 600	F8	6	4.5	2700/175	2.4	0.05
3100074	B8	490 x 592 x 600	F8	5	3.6	2250/180	2.1	0.05
3100075	C8	287 x 592 x 600	F8	3	2.3	1350/170	1.5	0.03

* 20mm header frame is available on request.

Hi-Flo® T-Series



Advantages

- Large surface area
- Ultra compact
- Low pressure drop
- Controlled media spacing (CMS)
- High dust holding capacity

Application: Air conditioning applications.

Type: Compact multi-pocket bag filter.

Frame: Galvanised steel.

Media: Glass fibre.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8, and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of pockets	Media area m²	Airflow/pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3100025	TM6	592 x 592 x 380	M6	12	5.5	3400/90	2.3	0.05
3100026	TN6	490 x 592 x 380	M6	10	4.6	2800/90	2.2	0.05
3100027	TO6	287 x 592 x 380	M6	6	2.7	1700/90	1.4	0.03
3100053	TM7	592 x 592 x 380	F7	12	5.5	3400/130	2.3	0.05
3100054	TN7	490 x 592 x 380	F7	10	4.6	2800/130	2.1	0.05
3100055	TO7	287 x 592 x 380	F7	6	2.7	1700/130	1.4	0.03
3100081	TM8	592 x 592 x 380	F8	12	5.5	3400/205	2.3	0.05
3100082	TN8	490 x 592 x 380	F8	10	4.6	2800/205	2.0	0.05
3100083	TO8	287 x 592 x 380	F8	6	2.7	1700/205	1.4	0.03

* 20mm header frame is available on request.

S-Flo P Series



Advantages

- Extended surface multi-pocket filter
- Comprehensive range of standard sizes
- Unique pocket design
- High efficiency
- Large surface area
- Controlled media spacing (CMS)

Application: Air conditioning applications.

Type: Extended surface multi pocket bag filter.

Case: Galvanised steel.

Media: Synthetic fibre.

EN779:2002 filter class: F6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

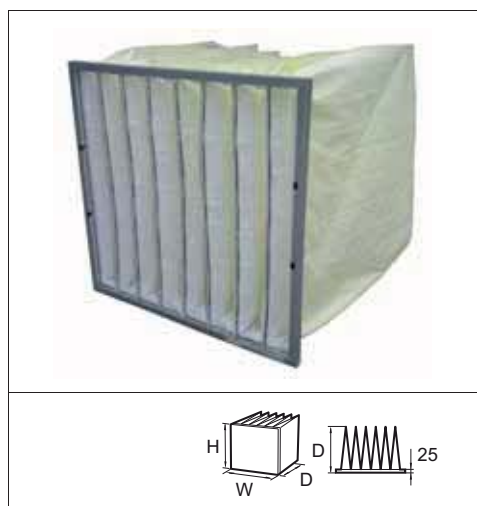
Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2002	Number of pockets	Media area m ²	AirFlow/pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
3300009	P6	592 x 592 x 534	F6	10	6.5	3400/90	2.7	0.05
3300010	Q6	490 x 592 x 534	F6	8	5.2	2800/90	2.4	0.05
3300011	R6	287 x 592 x 534	F6	5	3.2	1700/90	1.6	0.03
3300033	P7	592 x 592 x 534	F7	10	6.5	3400/115	2.7	0.05
3300034	Q7	490 x 592 x 534	F7	8	5.2	2800/115	2.4	0.05
3300035	R7	287 x 592 x 534	F7	5	3.2	1700/115	1.6	0.03
3300057	P8	592 x 592 x 534	F8	10	6.5	3400/135	2.7	0.05
3300058	Q8	490 x 592 x 534	F8	8	5.2	2800/135	2.4	0.05
3300059	R8	287 x 592 x 534	F8	5	3.2	1700/135	1.6	0.03

* 20mm header frame is available on request.

S-Flo U Series



Advantages

- Multi-pocket bag filter
- Comprehensive range of standard sizes
- Robust metal header frame
- Unique pocket design
- Large surface area
- Controlled media spacing (CMS)

Application: Air conditioning applications.

Type: Extended surface multi pocket bag filter.

Case: Galvanised steel.

Media: Synthetic fibre.

EN779:2002 filter class: F6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2002	Number of pockets	Media area m²	Airflow/pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3300013	UM6	592 x 592 x 600	F6	8	6	3400/75	2.8	0.05
3300014	UG6	490 x 592 x 600	F6	6	4.5	2800/75	2.4	0.05
3300015	UH6	287 x 592 x 600	F6	4	3	1700/75	1.6	0.03
3300037	UF7	592 x 592 x 600	F7	8	6	3400/95	2.8	0.05
3300038	UG7	490 x 592 x 600	F7	6	4.5	2800/95	2.4	0.05
3300039	UH7	287 x 592 x 600	F7	4	3	1700/95	1.6	0.03
3300061	UF8	592 x 592 x 600	F8	8	6	3400/110	2.8	0.05
3300062	UG8	490 x 592 x 600	F8	6	4.5	2800/110	2.4	0.05
3300063	UH8	287 x 592 x 600	F8	4	3	1700/110	1.6	0.03

* 20mm header frame is available on request.

S-Flo A Series



Advantages

- Multi-pocket bag filter
- Comprehensive range of standard sizes
- Robust metal header frame
- Unique pocket design
- Available in a range of efficiencies

Application: Comfort air conditioning applications, prefilter applications.

Type: Multi pocket bag filter.

Case: Galvanised steel.

Media: Synthetic fibre.

EN779:2002 filter class: F5, F6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 10, MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2002	Number of pockets	Media area m²	Airflow/pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3300073	A5	592 x 592 x 600	F5	6	4.5	3400/75	2.4	0.05
3300074	B5	490 x 592 x 600	F5	5	3.6	2700/75	2	0.05
3300075	C5	287 x 592 x 600	F5	3	2.3	1700/75	1.5	0.03
3300017	A6	592 x 592 x 600	F6	6	4.5	3400/100	2.4	0.05
3300018	B6	490 x 592 x 600	F6	5	3.6	2800/100	2	0.05
3300019	C6	287 x 592 x 600	F6	3	2.3	1700/100	1.5	0.03
3300041	A7	592 x 592 x 600	F7	6	4.5	3400/110	2.4	0.05
3300042	B7	490 x 592 x 600	F7	5	3.6	2800/110	2	0.05
3300043	C7	287 x 592 x 600	F7	3	2.3	1700/110	1.5	0.05
3300065	A8	592 x 592 x 600	F8	6	4.7	3400/145	2.4	0.05
3300066	B8	490 x 592 x 600	F8	5	3.6	2800/145	2	0.05
3300067	C8	287 x 592 x 600	F8	3	2.3	1700/145	1.5	0.03

* 20mm header frame is available on request.

Opakfil Start



Advantages

- Integrity of a rigid minipleat performance in an energy saving lightweight design.
- No metal parts
- Incinerable
- Unaffected by varying airflow, excellent for VAV systems

Description: High efficiency, V-style air filter in an all plastic enclosing frame.

Typical applications: Built-up filter banks, rooftops, split systems, free-standing units, package systems and air handlers.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Media: Microfine glass media in a mini-pleat design formed into multiple V-bank media packs.

Frame: ABS.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

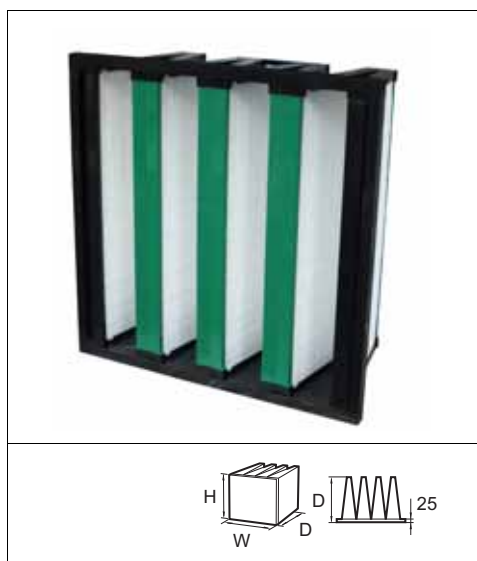
Temperature: Maximum continuous operating temperature of 70° C.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / Pressure drop m³/hr/Pa	Unit weight kg	Unit Volume m³
2480001	Opakfil 2V-242412-60	594 x 594 x 280	M6	9.6	3400/65	3.3	0.13
2480002	Opakfil 2V-242012-60	594 x 492 x 280	M6	7.6	2800/65	2.8	0.13
2480003	Opakfil 2V-241212-60	594 x 289 x 280	M6	4.2	1700/70	2.1	0.06
2480004	Opakfil 2V-242412-90	594 x 594 x 280	F7	9.6	3400/105	3.3	0.13
2480005	Opakfil 2V-242012-90	594 x 492 x 280	F7	7.6	2800/110	2.8	0.13
2480006	Opakfil 2V-241212-90	594 x 289 x 280	F7	4.2	1700/125	2.1	0.06
2480007	Opakfil 2V-242412-95	594 x 594 x 280	F8	9.6	3400/140	3.3	0.13
2480008	Opakfil 2V-242012-95	594 x 492 x 280	F8	7.6	2800/140	2.8	0.13
2480009	Opakfil 2V-241212-95	594 x 289 x 280	F8	4.2	1700/165	2.1	0.06

*25mm header frame is available on request.

Opakfil Green



Advantages

- Long operating life
- Light and robust
- Large surface area
- Incinerable
- Certified performance optimised for LCC
- No metal parts

Application: Air conditioning applications and prefiltration for clean rooms.

Type: High efficiency, incinerable filter.

Frame: ABS.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

EN779:2012 filter class: M6, F7, F8, F9.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14, MERV 15.

Recommended final pressure drop: 450 Pa (suggested economical change point 350 Pa).

Temperature: 70°C maximum in continuous service.

Mounting system: Front and side access housing and frames are available, Type 8 and FC housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
2400001	3OPGHF-242412-60	592 x 592 x 292	M6	19	3400/80	5	0.13
2400002	3OPGHF-242012-60	592 x 490 x 292	M6	15	2800/80	4	0.13
2400003	3OPGHF-241212-60	592 x 287 x 292	M6	9	1700/80	3	0.06
2400004	3OPGHF-242412-90	592 x 592 x 292	F7	19	3400/90	5	0.13
2400005	3OPGHF-242012-90	592 x 490 x 292	F7	15	2800/90	4	0.13
2400006	3OPGHF-241212-90	592 x 287 x 292	F7	9	1700/110	3	0.06
2400007	3OPGHF-242412-95	592 x 592 x 292	F8	19	3400/105	5	0.13
2400008	3OPGHF-242012-95	592 x 490 x 292	F8	15	2800/105	4	0.13
2400009	3OPGHF-241212-95	592 x 287 x 292	F8	9	1700/120	3	0.06
2400010	3OPGHF-242412-98	592 x 592 x 292	F9	19	3400/128	5	0.13
2400011	3OPGHF-242012-98	592 x 490 x 292	F9	15	2800/128	4	0.13
2400012	3OPGHF-241212-98	592 x 287 x 292	F9	9	1700/140	3	0.06

Opakfil CC



Advantages

- Robust construction
- Long operating life
- Light and robust
- Large surface area
- Incinerable
- No metal parts

Application: Air conditioning applications and prefiltration for clean rooms.

Type: High efficiency, incinerable filter.

Frame: ABS.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

EN779:2012 filter class: M6, F7, F8, F9.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14, MERV 15.

Recommended final pressure drop: 450 Pa (suggested economical change point 350 Pa).

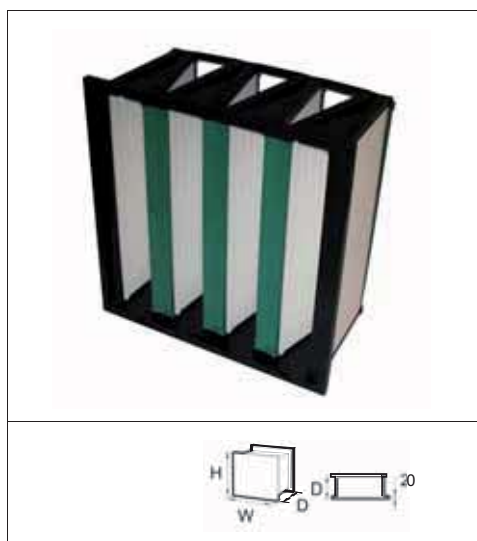
Temperature: 70°C maximum in continuous service.

Mounting system: Front and side access housing and frames are available, Type 8 and FC housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
2410001	3OPCCHF-242412-60	592 x 592 x 292	M6	14.3	3400/90	5	0.13
2410002	3OPCCHF-242012-60	592 x 490 x 292	M6	11.3	2800/95	4	0.13
2410003	3OPCCHF-241212-60	592 x 287 x 292	M6	6.8	1700/90	3	0.06
2410004	3OPCCHF-242412-90	592 x 592 x 292	F7	14.3	3400/95	5	0.13
2410005	3OPCCHF-242012-90	592 x 490 x 292	F7	11.3	2800/95	4	0.13
2410006	3OPCCHF-241212-90	592 x 287 x 292	F7	6.8	1700/95	3	0.06
2410007	3OPCCHF-242412-95	592 x 592 x 292	F8	14.3	3400/115	5	0.13
2410008	3OPCCHF-242012-95	592 x 490 x 292	F8	11.3	2800/115	4	0.13
2410009	3OPCCHF-241212-95	592 x 287 x 292	F8	6.8	1700/135	3	0.06
2410010	3OPCCHF-242412-98	592 x 592 x 292	F9	14.3	3400/160	5	0.13
2410011	3OPCCHF-242012-98	592 x 490 x 292	F9	11.3	2800/165	4	0.13
2410012	3OPCCHF-241212-98	592 x 287 x 292	F9	6.8	1700/180	3	0.06

Durafil® ES



Advantages

- Longest lasting high efficiency filter
- Lowest Life-Cycle Cost (LCC) filter available
- Fine fiber ensures that filter will maintain its efficiency throughout its life in the system
- Lowest initial pressure drop of any ASHRAE grade high efficiency air filter
- Built-in spacer for pleated prefilters

Description: High capacity, high efficiency, V-style air filter in an all plastic enclosing frame.

Typical applications: Built-up filter banks, rooftops, split systems, free-standing units, package systems and air handlers.

EN779:2012 filter class: M6, F7, F8, F9.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14, MERV 15.

Media: Microfine glass media in a minipleat design formed into multiple V-bank media packs.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: Maximum continuous operating temperature of 70° C.

Fire rating: UL 900.

Reference	Model	Dimension (H x W x D) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa
2490001	DU4V-ES-242412-M6	592 x 592 x 315	M6	18.3	3400/55
2490002	DU4V-ES-202412-M6	592 x 492 x 315	M6	15.0	2550/55
2490003	DU4V-ES-122412-M6	592 x 289 x 315	M6	8.3	1700/55
2490004	DU4V-ES-242412-F7	592 x 592 x 315	F7	18.3	3400/70
2490005	DU4V-ES-202412-F7	592 x 492 x 315	F7	15.0	2550/70
2490006	DU4V-ES-122412-F7	592 x 289 x 315	F7	8.3	1700/70
2490007	DU4V-ES-242412-F8	592 x 592 x 315	F8	18.3	3400/70
2490008	DU4V-ES-202412-F8	592 x 492 x 315	F8	15.0	2550/70
2490009	DU4V-ES-122412-F8	592 x 289 x 315	F8	8.3	1700/70
2490010	DU4V-ES-242412-F9	592 x 592 x 315	F9	18.3	3400/105
2490011	DU4V-ES-202412-F9	592 x 492 x 315	F9	15.0	2550/105
2490012	DU4V-ES-122412-F9	592 x 289 x 315	F9	8.3	1700/105

Durafil® ESB



Advantages

- Dual headers for front loading filter installations
- Lowest Life-Cycle Cost (LCC) filter available
- Built-in spacer for pleated prefilters
- Lowest initial pressure drop of any dual header box style air filter
- Fine fiber ensures that the filter will maintain efficiency throughout its life in the system

Description: High capacity, high efficiency, V-style air filter in an all plastic enclosing frame.

Typical applications: Built-up filter banks, rooftops, split systems, free-standing units, package systems and air handlers that require a filter with dual headers.

EN779:2012 filter class: M6, F7, F8, F9.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14, MERV 15.

Media: Microfine glass media in a mini-pleat design formed into multiple V-bank media packs.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: Maximum continuous operating temperature of 70° C.

Fire rating: UL 900.

Reference	Model	Dimension (H x W x D) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa
2495001	DU4V-ESB-242412-M6	592 x 592 x 315	M6	18.3	3400/65
2495002	DU4V-ESB-242012-M6	592 x 492 x 315	M6	15.0	2550/65
2495003	DU4V-ESB-241212-M6	592 x 289 x 315	M6	8.3	1700/65
2495004	DU4V-ESB-242412-F7	592 x 592 x 315	F7	18.3	3400/80
2495005	DU4V-ESB-242012-F7	592 x 492 x 315	F7	15.0	2550/80
2495006	DU4V-ESB-241212-F7	592 x 289 x 315	F7	8.3	1700/80
2495007	DU4V-ESB-242412-F8	592 x 592 x 315	F8	18.3	3400/85
2495008	DU4V-ESB-242012-F8	592 x 492 x 315	F8	15.0	2550/85
2495009	DU4V-ESB-241212-F8	592 x 289 x 315	F8	8.3	1700/85
2495010	DU4V-ESB-242412-F9	592 x 592 x 315	F9	18.3	3400/115
2495011	DU4V-ESB-242012-F9	592 x 492 x 315	F9	15.0	2550/115
2495012	DU4V-ESB-241212-F9	592 x 289 x 315	F9	8.3	1700/115

OpakAir



Advantages

- Large surface area
- Up to 6000 m³/hr air flow
- Less frequent changes
- Low pressure drop

Application: High air flow air conditioning and process air applications.

Type: High capacity compact filter.

Case: Galvanised steel.

Gasket: Endless polyurethane.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

EN779:2012 filter class: F7, F8.

ASHRAE 52.2:2007 filter class: MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Mounting System: Front and side access housings and safechange systems are available.

Fire rating: DIN 53438 Class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
2420003	Opakair-90	610 x 610 x 292	F7	21.4	4500/105	21	0.13
2420004	Opakair-90	305 x 610 x 292	F7	14	2250/105	12	0.07
2420005	Opakair-95	610 x 610 x 292	F8	21.4	4500/130	21	0.13
2420006	Opakair-95	305 x 610 x 292	F8	8.6	2250/130	12	0.07

Aiopac® 3GGM



Advantages

- Large surface area
- Savings in operating costs
- Less frequent changes
- Ultra compact
- High dust holding capacity

Application: Air conditioning or industrial processing systems and for mini air conditioning systems, individual modules.

Type: High efficiency compact filter.

Frame: Galvanised steel.

Media: Glass fibre paper.

Separator: Hot-melt beads.

EN779:2012 filter class: M6, F7 and F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13 and MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

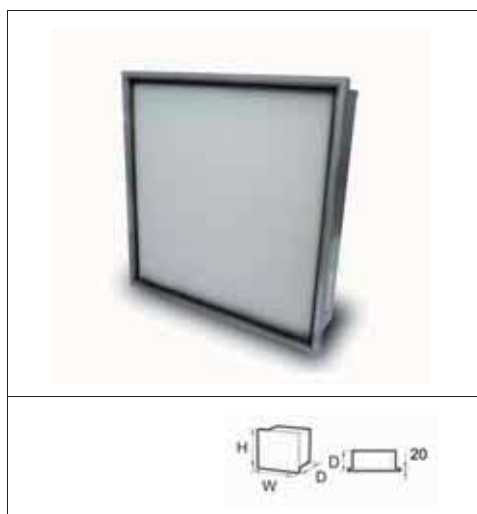
Temperature: 70°C maximum in continuous service.

Fire rating: DIN 53438 Class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air Flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
2100001	3GGM-24246-60	610 x 610 x 150	M6	12.3	3400/65	6.8	0.06
2100002	3GGM-20246-60	508 x 610 x 150	M6	10.3	2850/65	5.7	0.06
2100003	3GGM-12246-60	305 x 610 x 150	M6	6.1	1700/65	4	0.03
2100004	3GGM-20206-60	508 x 508 x 150	M6	8.6	2375/65	5	0.06
2100009	3GGM-24246-90	610 x 610 x 150	F7	12.3	3400/100	6.8	0.06
2100010	3GGM-20246-90	508 x 610 x 150	F7	10.3	2850/100	5.7	0.06
2100011	3GGM-12246-90	305 x 610 x 150	F7	6.1	1700/100	4	0.03
2100012	3GGM-20206-90	508 x 508 x 150	F7	8.6	2375/100	5	0.06
2100017	3GGM-24246-95	610 x 610 x 150	F8	12.3	3400/130	6.8	0.06
2100018	3GGM-20246-95	508 x 610 x 150	F8	10.3	2850/130	5.7	0.06
2100019	3GGM-12246-95	305 x 610 x 150	F8	6.1	1700/130	4	0.03
2100020	3GGM-20206-95	508 x 508 x 150	F8	8.6	2375/130	5	0.08

* Other sizes are available on request.

Airopac® 3GGMHF



Advantages

- Large surface area
- Savings in operating costs
- Less frequent changes
- Ultra compact
- High dust holding capacity

Application: Air conditioning or industrial processing systems and for mini air conditioning systems, individual modules.

Type: High efficiency compact filter.

Frame: Galvanised steel.

Media: Glass fibre paper.

Separator: Hot-melt beads.

EN779:2012 filter class: M6, F7 and F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13 and MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Fire rating: DIN 53438 Class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
2120001	3GGMHF-24245-60	592 x 592 x 135	M6	10.3	3400/85	6.8	0.07
2120002	3GGMHF-20245-60	490 x 592 x 135	M6	8.3	2850/90	5.7	0.07
2120003	3GGMHF-12245-60	287 x 592 x 135	M6	4.5	1700/105	3.8	0.04
2120004	3GGMHF-20205-60	490 x 490 x 135	M6	6.8	2375/90	5	0.07
2120005	3GGMHF-24245-90	592 x 592 x 135	F7	10.3	3400/125	6.8	0.07
2120006	3GGMHF-20245-90	490 x 592 x 135	F7	8.3	2850/130	5.7	0.07
2120007	3GGMHF-12245-90	287 x 592 x 135	F7	4.5	1700/145	3.8	0.04
2120008	3GGMHF-20205-90	490 x 490 x 135	F7	6.8	2375/135	5	0.07
2120009	3GGMHF-24245-95	592 x 592 x 135	F8	10.3	3400/160	6.8	0.07
2120010	3GGMHF-20245-95	490 x 592 x 135	F8	8.3	2850/170	5.7	0.07
2120011	3GGMHF-12245-95	287 x 592 x 135	F8	4.5	1700/195	3.8	0.04
2120012	3GGMHF-20205-95	490 x 490 x 135	F8	6.8	2375/175	5	0.07

* other sizes are available on request.

EcoPleat Green



Advantages

- Large surface area
- Long operating life
- Ultra compact
- High dust holding capacity
- Less frequent changes

Application: Air conditioning or industrial processing systems and for mini air conditioning systems, individual modules, ventilation equipment.

Type: High efficiency compact filter.

Frame: Plastic frame.

Media: Wet-laid glass fibre paper.

Separator: Hot melt glue.

Sealant: Polyurethane.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 350 Pa.

Temperature: 70°C.

Relative humidity: 100% RH.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow/ pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
2715001	3GPPS-12242-M6	287x592x48	M6	2.9	950/65	2	0.01
2715002	3GPPS-20242-M6	490x592x48	M6	4.9	1500/65	2.5	0.015
2715003	3GPPS-24242-M6	592x592x48	M6	5.9	1900/60	3	0.02
2715004	3GPPS-12242-F7	287x592x48	F7	2.9	950/90	2	0.01
2715005	3GPPS-20242-F7	490x592x48	F7	4.9	1500/90	2.5	0.015
2715006	3GPPS-24242-F7	592x592x48	F7	5.9	1900/90	3	0.02
2715007	3GPPS-12242-F8	287x592x48	F8	2.9	950/120	2	0.01
2715008	3GPPS-20242-F8	490x592x48	F8	4.9	1500/120	2.5	0.015
2715009	3GPPS-24242-F8	592x592x48	F8	5.9	1900/110	3	0.02
2714001	3GPPS-12244-M6	287x592x96	M6	4.8	1700/90	3	0.02
2714002	3GPPS-20244-M6	490x592x96	M6	9.9	2800/90	3.5	0.03
2714003	3GPPS-24244-M6	592x592x96	M6	11.9	3400/90	4	0.04
2714004	3GPPS-12244-F7	287x592x96	F7	5.8	1700/110	3	0.02
2714005	3GPPS-20244-F7	490x592x96	F7	9.9	2800/110	3.5	0.03
2714006	3GPPS-24244-F7	592x592x96	F7	11.9	3400/110	4	0.04
2714007	3GPPS-12244-F8	287x592x96	F8	5.8	1700/150	3	0.02
2714008	3GPPS-20244-F8	490x592x96	F8	9.9	2800/150	3.5	0.03
2714009	3GPPS-24244-F8	592x592x96	F8	11.9	3400/150	4	0.04

* Other sizes are available on request

Airopac® Green



Advantages

- Low pressure drop
- Water resistant beverage board
- Large surface area
- Incinerable
- Rigid design concept
- High dust holding capacity

Application: Air conditioning applications and preparatory filtration in clean rooms.

Type: High efficiency compact filter.

Frame: Rigid water resistance beverage cardboard.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Mounting system: Front and side access housing and frames are available.

Holding frames: Type 8 and FC Housings.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
2700001	3GP-24244-60	594 x 594 x 95	M6	11.8	3400/70	3	0.034
2700002	3GP-20244-60	492 x 594 x 95	M6	9.7	2810/70	2.5	0.028
2700003	3GP-12244-60	289 x 594 x 95	M6	5.7	1645/80	1.6	0.016
2700004	3GP-20204-60	492 x 492 x 95	M6	8	2325/75	2.1	0.023
2700013	3GP-24244-90	594 x 594 x 95	F7	11.8	3400/130	3.1	0.034
2700014	3GP-20244-90	492 x 492 x 95	F7	9.7	2810/130	2.5	0.028
2700015	3GP-12244-90	289 x 594 x 95	F7	5.7	1645/155	1.6	0.016
2700016	3GP-20204-90	492 x 492 x 95	F7	8	2325/140	2.1	0.023
2700025	3GP-24244-95	594 x 594 x 95	F8	11.8	3400/150	3.1	0.034
2700026	3GP-20244-95	492 x 594 x 95	F8	9.7	2810/155	2.5	0.028
2700027	3GP-12244-95	289 x 594 x 95	F8	5.7	1645/175	1.6	0.016
2700028	3GP-20204-95	492 x 492 x 95	F8	8	2325/160	2.1	0.023

Riga-Flo



Advantages

- Range of standard sizes
- High efficiency
- Rigid design concept
- Suitable for turbulent airflow

Application: Air conditioning applications.

Type: Rigid pleated filter.

Case: Galvanised steel.

Media: Glass fibre.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available.

Fire rating: UL 900.

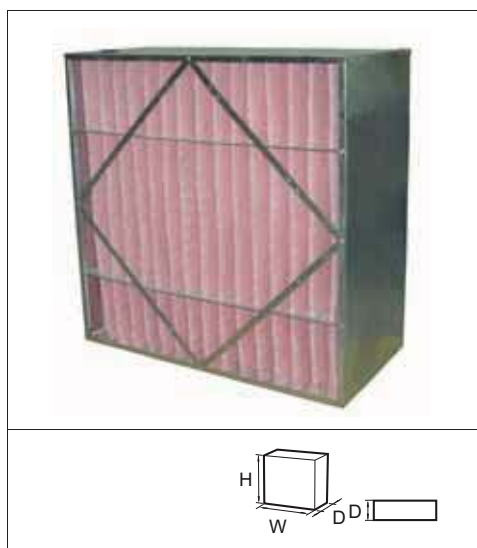
Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
96026001	RF15 CL2 24x24x12	594 x 594 x 292	M6	5.39	3400/70	5.5	0.1
96026005	RF15 CL2 24x12x12	289 x 594 x 292	M6	2.69	1700/70	5.0	0.1
97293001	RF15 CL2 24x24x6	594 x 594 x 149	M6	2.69	2040/60	5.5	0.05
97293005	RF15 CL2 24x12x6	289 x 594 x 149	M6	1.3	1020/60	3.5	0.03
96026002	RF100 CL2 24x24x12	594 x 594 x 292	F7	5.39	3400/125	5.5	0.1
96026006	RF100 CL2 24x12x12	289 x 594 x 292	F7	2.69	1700/125	3.5	0.05
97293002	RF100 CL2 24x24x6	594 x 594 x 149	F7	2.69	2040/100	5.5	0.05
97293015	RF 100 CL2 24x12x6	292 x 594 x 149	F7	2.69	1020/100	5.5	0.03
96026003	RF200 CL2 24x24x12	594 x 594 x 292	F8	5.39	3400/170	5.5	0.1
96026007	RF200 CL2 24x12x12	289 x 594 x 292	F8	2.69	1700/170	3.5	0.05
97293003	RF200 CL2 24x24x6	594 x 594 x 149	F8	2.69	2040/140	5.5	0.05
97293007	RF200 CL2 24x12x6	289 x 594 x 149	F8	1.3	1020/140	3.5	0.03

*Other sizes available on request

*PH version available (with header frame)

Pleated Compact Filter

Riga-Flo P



Advantages

- Range of standard sizes
- High efficiency
- Rigid design concept
- Suitable for turbulent airflow

Application: Air conditioning applications.

Type: Rigid pleated filter.

Frame: Galvanised steel.

Media: Synthetic.

EN779:2002 filter class: F8.

ASHRAE 52.2:2007 filter class: MERV 13, MERV 14.

Recommended final pressure drop: 450 Pa (suggested economical change point 250 Pa).

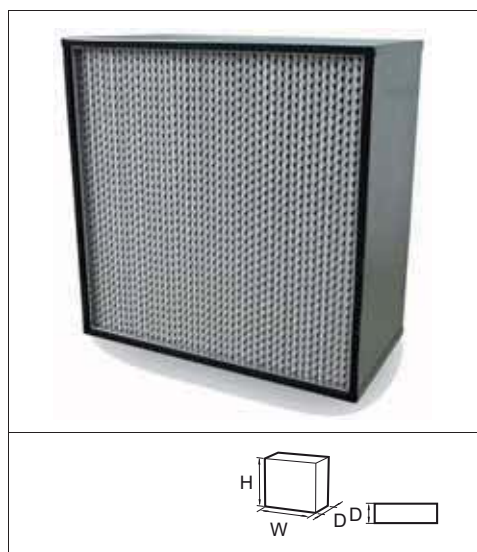
Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2002	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
122556004	RFP95 CL2 24x24x12	594 x 594 x 292	F8	5.39	3400/90	7.7	0.1
122556014	RFP95 CL2 24x12x12	289 x 594 x 292	F8	2.6	1700/90	4.55	0.05
122556024	RFP95 CL2 24x20x12	492 x 594 x 292	F8	4.37	2822/90	5.77	0.09
122556034	RFP95 CL2 20x20x12	492 x 492 x 292	F8	3.62	2380/90	5.77	0.07

3CPM Aeropac



Advantages

- Robust design
- Fine fibre ensures that filter maintains its efficiency throughout its life in the system
- Large dust holding capacity
- Suitable for variable airflow

Description: High efficiency box style air filter with wet-laid paper style media in an all-metal enclosing frame.

Applications: Built-up filter banks, rooftops, split systems, free-standing units, package systems and air handlers.

Type: Rigid pleated filter.

Frame: Galvanised steel.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Media: Microfine glass media formed into full pack depth pleats separated by corrugated aluminum separators.

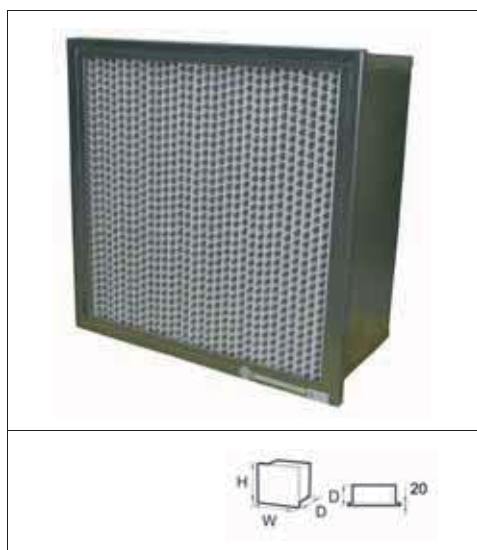
Recommended final pressure drop: 450 Pa (suggested economical change point 250Pa).

Temperature: 70°C.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
2155001	3CPM-65-242412	592 x 592 x 292	M6	12.3	3400/110	8.6	0.1
2155002	3CPM-65-241212	287 x 592 x 292	M6	5.8	1700/110	6.4	0.05
2156001	3CPM-85-242412	592 x 592 x 292	F7	12.3	3400/145	8.6	0.1
2156002	3CPM-85-241212	287 x 592 x 292	F7	5.8	1700/145	6.4	0.05
2157003	3CPM-95-242412	592 x 592 x 292	F8	12.3	3400/160	8.6	0.1
2157002	3CPM-95-241212	287 x 592 x 292	F8	5.8	1700/160	6.4	0.05
2150002	3CPM-242412-60	610 x 610 x 292	M6	15.7	3400/75	8.6	0.11
2150001	3CPM-122412-60	305 x 610 x 292	M6	7.8	1700/75	6.4	0.05
2151007	3CPM-242412-90	610 x 610 x 292	F7	15.7	3400/110	8.6	0.11
2151008	3CPM-122412-90	305 x 610 x 292	F7	7.8	1700/110	6.4	0.05
2152003	3CPM-242412-95	610 x 610 x 292	F8	15.7	3400/135	8.6	0.11
2152004	3CPM-122412-95	305 x 610 x 292	F8	7.8	1700/135	6.4	0.05

3HCP8 Aeropac



Advantages

- Fine fiber ensures that filter maintains its efficiency throughout its life in the system
- High dust holding capacity
- Robust design
- Suitable for variable airflow

Description: High efficiency box style air filter with wet-laid paper style media in an all-metal enclosing frame.

Applications: Built-up filter banks, rooftops, split systems, free-standing units, package systems and air handlers.

Type: Rigid pleated filter.

Frame: Galvanised steel.

EN779:2012 filter class: M6, F7, F8.

ASHRAE 52.2:2007 filter class: MERV 11, MERV 13, MERV 14.

Media: Microfine glass media formed into full pack depth pleats separated by corrugated aluminum.

Recommended final pressure drop: 450 Pa (suggested economical change point 250Pa).

Temperature: Maximum continuous operating temperature of 90° C.

Fire Rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
2135001	3HCP8-65-242412 AEROPAC	592 x 592 x 292	M6	10.8	3400/110	8.6	0.1
2135002	3HCP8-65-122412 AEROPAC	287 x 592 x 292	M6	5	1700/110	6.4	0.05
2136001	3HCP8-85-242412 AEROPAC	592 x 592 x 292	F7	10.8	3400/150	8.6	0.1
2136002	3HCP8-85-241212 AEROPAC	287 x 592 x 292	F7	5	1700/150	6.4	0.05
2137001	3HCP8-95-242412 AEROPAC	592 x 592 x 292	F8	10.8	3400/160	8.6	0.1
2137002	3HCP8-95-241212 AEROPAC	287 x 592 x 292	F8	5	1700/160	6.4	0.05
2130002	3CPMHF-122412-60	287 x 592 x 292	M6	5.6	1700/95	6.4	0.05
2130003	3CPMHF-242412-60	592 x 592 x 292	M6	13.1	3400/95	8.6	0.1
2131001	3CPMHF-242412-90	592 x 592 x 292	F7	13.1	3400/130	8.6	0.1
2131002	3CPMHF-122412-90	287 x 592 x 292	F7	5.6	1700/130	6.4	0.05
2132001	3CPMHF-242412-95	592 x 592 x 292	F8	13.1	3400/155	8.6	0.1
2132002	3CPMHF-122412-95	287 x 592 x 292	F8	5.6	1700/155	6.4	0.05

Summary EPA / HEPA / ULPA Filters, Class E10 to U17



Filters for High Efficiency
Absolute™ CE - E11, H13
Page 82



Filters for High Efficiency
Absolute™ CM - E11, H13
Page 83



Filters for High Efficiency
Absolute™ DE - H13, H14
Page 84



Filters for High Efficiency
Absolute™ DG - H13, H14
Page 85



Filters for High Efficiency
Absolute™ VE XL, XXL - E11, H13, H14
Page 86



Filters for High Efficiency
Absolute™ VG XL, XXL - E11, H13, H14
Page 87



Filters for High Efficiency
Absolute™ VG HF - E10, H13
Page 88



HEPA/ULPA Panels
Megalam MD, MX, MG
Page 89



HEPA/ULPA Panels
Megalam MD - H13 to U15
Page 92



HEPA/ULPA Panels
Megalam MX - H14 to U15
Page 93



HEPA/ULPA Panels
Megalam MG - H14 to U15
Page 94



HEPA/ULPA Panels
Megalam (Laminator) MDL, MXL, MGL - H14 to U15
Page 95

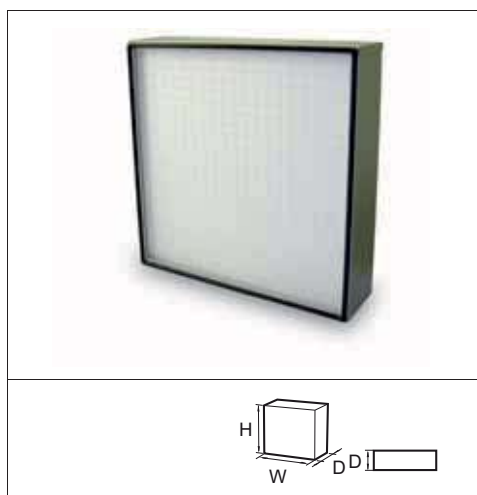


HEPA/ULPA Panels
Silent Hood HD - H13 to U15
Page 96



HEPA/ULPA Panels
Silent Hood HL - H13 to U15
Page 98

Absolute™ CE - E11, H13



Advantages

- Range of standard sizes
- Compact design
- Very high efficiency
- H13 are individually tested

Application: Very high efficiency final filtration in air conditioning systems housings-ducts or diffusers.

Type: Close pleated very high efficiency filter.

Frame: Electro Zinc.

Gasket: Endless polyurethane gasket at inlet.

Media: Pleated glass paper.

Separator: Hot melt beads.

Sealant: Polyurethane.

EN 1822:2009 filter class: E11, H13.

MPPS efficiency: E11: ≥ 95%, H13: ≥ 99.95%,

DOP efficiency: ≥ 99%

Recommended final pressure drop: 500 Pa.

Maximum flow rate: Nominal flow rate, otherwise reduction in efficiency.

Temperature: 70°C maximum in continuous service.

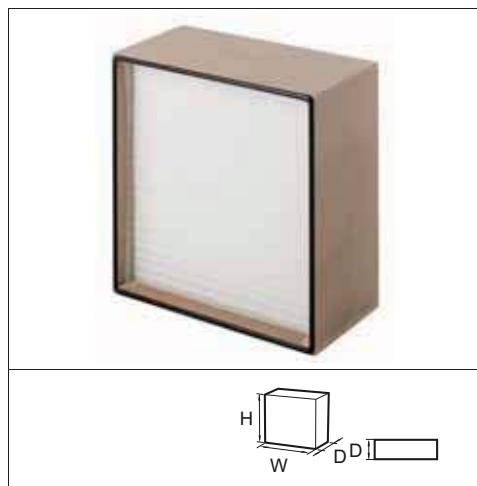
Mounting systems: FCB Housings, Ducts, Diffusers, CAMSAFE.

Fire rating: DIN 53438 Class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
1400508	CED11-305x305x150-P0	305 x 305 x 150	E11	2.2	290/125	4	0.02
1400506	CED11-457x457x150-P0	457 x 457 x 150	E11	4.9	660/125	10	0.04
1400505	CED11-575x575x150-P0	575 x 575 x 150	E11	7.8	1055/125	11	0.07
1400507	CED11-305x610x150-P0	305 x 610 x 150	E11	4.4	590/125	6	0.04
1400504	CED11-610x610x150-P0	610 x 610 x 150	E11	8.9	1190/125	12	0.07
1400503	CED11-762x610x150-P0	762 x 610 x 150	E11	11.1	1490/125	13.5	0.09
1400502	CED11-914x610x150-P0	914 x 610 x 150	E11	13.3	1790/125	15	0.11
1400501	CED11-1219x610x150-P0	1219 x 610 x 150	E11	17.7	2380/125	18	0.14
1400558	CEX11-305x305x150-P0	305 x 305 x 150	E11	3	380/125	4	0.02
1400556	CEX11-457x457x150-P0	457 x 457 x 150	E11	6.9	865/125	10	0.04
1400555	CEX11-575x575x150-P0	575 x 575 x 150	E11	11	1385/125	11	0.07
1400557	CEX11-305x610x150-P0	305 x 610 x 150	E11	6.1	770/125	6	0.04
1400554	CEX11-610x610x150-P0	610 x 610 x 150	E11	12.4	1560/125	12	0.07
1400553	CEX11-762x610x150-P0	762 x 610 x 150	E11	15.5	1950/125	13.5	0.09
1400552	CEX11-914x610x150-P0	914 x 610 x 150	E11	18.6	2335/125	15	0.11
1400551	CEX11-1219x610x150-P0	1219 x 610 x 150	E11	24.8	3120/125	18	0.14
1400654	CEG11-305x610x292-P0	305 x 610 x 292	E11	7.2	950/125	7.2	0.07
1400653	CEG11-457x610x292-P0	457 x 610 x 292	E11	10.8	1420/125	9.9	0.13
1400652	CEG11-610x610x292-P0	610 x 610 x 292	E11	14.4	1900/125	12.5	0.13
1400651	CEG11-762x610x292-P0	762 x 610 x 292	E11	18	2380/125	16	0.18
1400704	CET11-305x610x292-P0	305 x 610 x 292	E11	10.9	1190/125	7.2	0.07
1400703	CET11-457x610x292-P0	457 x 610 x 292	E11	16.4	1780/125	10	0.11
1400702	CET11-610x610x292-P0	610 x 610 x 292	E11	21.8	2380/125	13	0.13
1400701	CET11-762x610x292-P0	762 x 610 x 292	E11	27	2975/125	16.2	0.18
1400008	CED13-305x305x150-P0	305 x 305 x 150	H13	2.4	317/250	4	0.02
1400006	CED13-457x457x150-P0-S	457 x 457 x 150	H13	5.5	726/250	10	0.04
1400005	CED13-575x575x150-P0-S	575 x 575 x 150	H13	8.7	1161/250	11	0.07
1400007	CED13-305x610x150-P0-S	305 x 610 x 150	H13	4.9	645/250	6	0.04
1400004	CED13-610x610x150-P0-S	610 x 610 x 150	H13	9.8	1305/250	12	0.07
1400003	CED13-762x610x150-P0-S	762 x 610 x 150	H13	12.3	1635/250	13.5	0.09
1400002	CED13-914x610x150-P0-S	914 x 610 x 150	H13	14.7	1958/250	15	0.11
1400001	CED13-1219x610x150-P0-S	1219 x 610 x 150	H13	19.7	2618/250	18	0.14
1400058	CEX13-305x305x150-P0	305 x 305 x 150	H13	3.2	380/250	4	0.02
1400056	CEX13-457x457x150-P0-S	457 x 457 x 150	H13	7.4	867/250	10	0.04
1400055	CEX13-575x575x150-P0-S	575 x 575 x 150	H13	12	1384/250	11	0.07
1400057	CEX13-305x610x150-P0-S	305 x 610 x 150	H13	6.6	773/250	6	0.04
1400054	CEX13-610x610x150-P0-S	610 x 610 x 150	H13	13.4	1565/250	12	0.07
1400053	CEX13-762x610x150-P0-S	762 x 610 x 150	H13	16.7	1957/250	13.5	0.09
1400052	CEX13-914x610x150-P0-S	914 x 610 x 150	H13	20.1	2348/250	15	0.11
1400051	CEX13-1219x610x150-P0-S	1219 x 610 x 150	H13	27.1	3131/250	18	0.14
1400154	CEG13-305x610x292-P0-S	305 x 610 x 292	H13	7.8	893/250	7	0.07
1400153	CEG13-457x610x292-P0-S	457 x 610 x 292	H13	11.7	1340/250	9.9	0.13
1400152	CEG13-610x610x292-P0-S	610 x 610 x 292	H13	15.7	1804/250	12.5	0.13
1400151	CEG13-762x610x292-P0-S	762 x 610 x 292	H13	19.6	2251/250	16	0.18
1400204	CET13-305x610x292-P0-S	305 x 610 x 292	H13	11.7	1230/250	7	0.07
1400203	CET13-457x610x292-P0-S	457 x 610 x 292	H13	17.5	1850/250	9.9	0.13
1400202	CET13-610x610x292-P0-S	610 x 610 x 292	H13	23.5	2485/250	12.5	0.13
1400201	CET13-762x610x292-P0-S	762 x 610 x 292	H13	29.4	3100/250	16	0.18

*Other sizes are available on request

Absolute™ CM - E11, H13



Advantages

- Range of standard sizes
- Compact design
- Very high efficiency
- Incinerable
- H13 are individually tested

Application: Very high efficiency final filtration.

Type: Close pleated very high efficiency filter.

Frame: Medium Density Fibre (MDF) board.

Gasket: Endless polyurethane gasket at inlet.

Media: Pleated glass paper.

Separator: Hot melt beads.

Sealant: Polyurethane.

EN 1822:2009 filter class: E11, H13.

MPPS efficiency: E11: ≥ 95%, H13: ≥ 99.95%.

DOP efficiency: ≥ 99%.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: Nominal flow rate, otherwise reduction in efficiency.

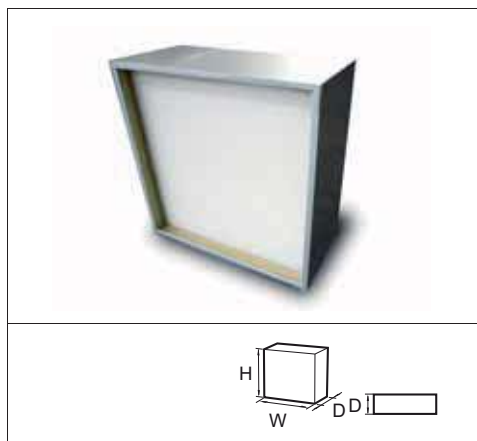
Temperature: 70°C maximum in continuous service.

Mounting systems: FCB Housings, Ducts, Diffusers, CAMSAFE.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
1400758	CMD11-305x305x150-P0	305 x 305 x 150	E11	1.8	236/125	4	0.02
1400756	CMD11-457x457x150-P0	457 x 457 x 150	E11	4.3	580/125	10	0.04
1400755	CMD11-575x575x150-P0	575 x 575 x 150	E11	7.1	950/125	11	0.07
1400757	CMD11-305x610x150-P0	305 x 610 x 150	E11	3.8	505/125	6	0.04
1400754	CMD11-610x610x150-P0	610 x 610 x 150	E11	8	1080/125	12	0.07
1400753	CMD11-762x610x150-P0	762 x 610 x 150	E11	10.1	1370/125	13.5	0.09
1400752	CMD11-914x610x150-P0	914 x 610 x 150	E11	12.3	1650/125	15	0.11
1400751	CMD11-1219x610x150-P0	1219 x 610 x 150	E11	16.5	2220/125	18	0.14
1400808	CMX11-305x305x150-P0	305 x 305 x 150	E11	2.5	310/125	4	0.02
1400806	CMX11-457x457x150-P0	457 x 457 x 150	E11	6	760/125	10	0.04
1400805	CMX11-575x575x150-P0	575 x 575 x 150	E11	9.9	1245/125	11	0.07
1400807	CMX11-305x610x150-P0	305 x 610 x 150	E11	5.3	668/125	6	0.04
1400804	CMX11-610x610x150-P0	610 x 610 x 150	E11	11.2	1410/125	12	0.07
1400803	CMX11-762x610x150-P0	762 x 610 x 150	E11	14.2	1788/125	12	0.09
1400802	CMX11-914x610x150-P0	914 x 610 x 150	E11	17.1	2150/125	15	0.11
1400801	CMX11-1219x610x150-P0	1219 x 610 x 150	E11	23	2900/125	18	0.14
1400904	CMG11-305x610x292-P0	305 x 610 x 292	E11	6.2	815/125	7.2	0.07
1400903	CMG11-457x610x292-P0	457 x 610 x 292	E11	9.6	1265/125	9.6	0.13
1400902	CMG11-610x610x292-P0	610 x 610 x 292	E11	13.1	1735/125	13	0.13
1400901	CMG11-762x610x292-P0	762 x 610 x 292	E11	16.6	2180/125	16.5	0.18
1400954	CMT11-305x610x292-P0	305 x 610 x 292	E11	9.2	1015/125	7.2	0.07
1400953	CMT11-457x610x292-P0	457 x 610 x 292	E11	14.4	1585/125	10	0.13
1400952	CMT11-610x610x292-P0	610 x 610 x 292	E11	19.8	2170/125	13	0.13
1400951	CMT11-762x610x292-P0	762 x 610 x 292	E11	25	2725/125	16.2	0.18
1400258	CMD13-305x305x150-P0	305 x 305 x 150	H13	1.9	258/250	4	0.02
1400256	CMD13-457x457x150-P0-S	457 x 457 x 150	H13	4.8	636/250	10	0.04
1400255	CMD13-575x575x150-P0-S	575 x 575 x 150	H13	7.9	1046/250	11	0.07
1400257	CMD13-305x610x150-P0-S	305 x 610 x 150	H13	4.2	553/250	6	0.04
1400254	CMD13-610x610x150-P0-S	610 x 610 x 150	H13	8.9	1183/250	12	0.07
1400253	CMD13-762x610x150-P0-S	762 x 610 x 150	H13	11.3	1497/250	13.5	0.09
1400252	CMD13-914x610x150-P0-S	914 x 610 x 150	H13	13.6	1805/250	15	0.11
1400251	CMD13-1219x610x150-P0-S	1219 x 610 x 150	H13	18.3	2434/250	18	0.14
1400308	CMX13-305x305x150-P0	305 x 305 x 150	H13	2.7	310/250	4	0.02
1400306	CMX13-457x457x150-P0-S	457 x 457 x 150	H13	6.5	760/250	8	0.04
1400305	CMX13-575x575x150-P0-S	575 x 575 x 150	H13	10.7	1247/250	10	0.07
1400307	CMX13-305x610x150-P0-S	305 x 610 x 150	H13	5.7	664/250	6	0.04
1400304	CMX13-610x610x150-P0-S	610 x 610 x 150	H13	12.1	1419/250	12	0.07
1400303	CMX13-762x610x150-P0-S	762 x 610 x 150	H13	15.3	1793/250	13.5	0.09
1400302	CMX13-914x610x150-P0-S	914 x 610 x 150	H13	18.5	2166/250	15	0.11
1400301	CMX13-1219x610x150-P0-S	1219 x 610 x 150	H13	24.9	2912/250	18	0.14
1400404	CMG13-305x610x292-P0-S	305 x 610 x 292	H13	6.7	770/250	7	0.07
1400403	CMG13-457x610x292-P0-S	457 x 610 x 292	H13	10.5	1210/250	9.9	0.13
1400402	CMG13-610x610x292-P0-S	610 x 610 x 292	H13	14.2	1635/250	12.5	0.13
1400401	CMG13-762x610x292-P0-S	762 x 610 x 292	H13	18.1	2075/250	16	0.18
1400454	CMT13-305x610x292-P0-S	305 x 610 x 292	H13	10.1	1060/250	7.2	0.07
1400453	CMT13-457x610x292-P0-S	457 x 610 x 292	H13	15.8	1670/250	10	0.13
1400452	CMT13-610x610x292-P0-S	610 x 610 x 292	H13	21.3	2250/250	13	0.13
1400451	CMT13-762x610x292-P0-S	762 x 610 x 292	H13	27.1	2855/250	16.2	0.18

*Other sizes are available on request

Absolute™ DE - H13, H14



Advantages

- High air flow applications
- High quality glass fibre media
- High efficiency
- Flexibility in size
- H13 & H14 are individually tested

Application: HEPA-filter for high air flows.

Type: HEPA-Filter.

Frame: Electro zinc.

Gasket: Endless polyurethane at inlet.

Media: Glass fibre.

Separators: Hot melt beads.

Sealant: Polyurethane.

EN 1822:2009 filter class: H13, H14.

MPPS Efficiency: H13: ≥99.95%, H14: ≥99.995%.

DOP efficiency: ≥99.99%

Recommended final pressure drop: 500 Pa.

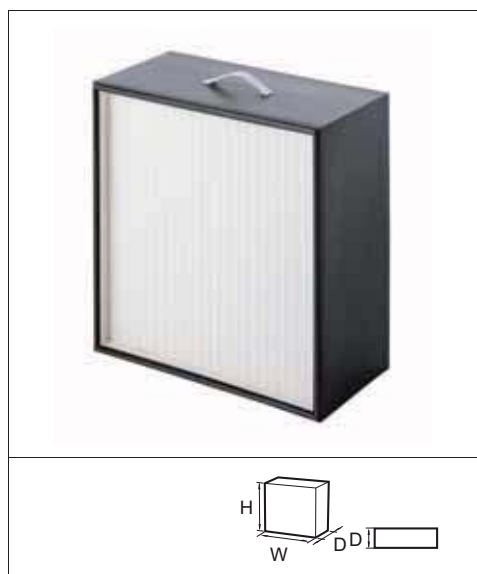
Temperature / Humidity: 70° C / 100% RH.

Fire rating: DIN 53438 Class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
1408031	DE13-305x610x292-P0-S	305 x 610 x 292	H13	19.8	1500/250	13	0.075
1408032	DE13-610x610x292-P0-S	610 x 610 x 292	H13	39.9	3000/250	16	0.143
1408033	DE13-762x610x292-P0-S	762 x 610 x 292	H13	50.1	3750/250	20	0.178
1408034	DE14-305x610x292-P0-S	305 x 610 x 292	H14	19.8	1300/250	13	0.075
1408035	DE14-610x610x292-P0-S	610 x 610 x 292	H14	39.9	2600/250	16	0.143
1408036	DE14-762x610x292-P0-S	762 x 610 x 292	H14	50.1	3300/250	20	0.178

* Other sizes and frames are available on request

Absolute™ DG - H13, H14



Advantages

- Rated airflow capacity of up to 3000 m³/h 610x610 (H13)
- Flexibility in size
- Lightweight and installation friendly
- VDI 6022
- H13 & H14 are individually tested

Application: HEPA-Filter for high air flows.

Type: HEPA-Filter.

Frame: ABS plastic with handle.

Gasket: Endless polyurethane.

Media: Glass fibre.

Separators: Hot melt beads.

Sealant: Polyurethane (2-K-sealant).

Recommended final pressure drop: 500 Pa / max. 1000 Pa.

EN 1822:2009 filter class: H13, H14.

MPPS efficiency: H13: ≥ 99.95%; H14: ≥ 99.995%.

DOP efficiency: ≥ 99.99%.

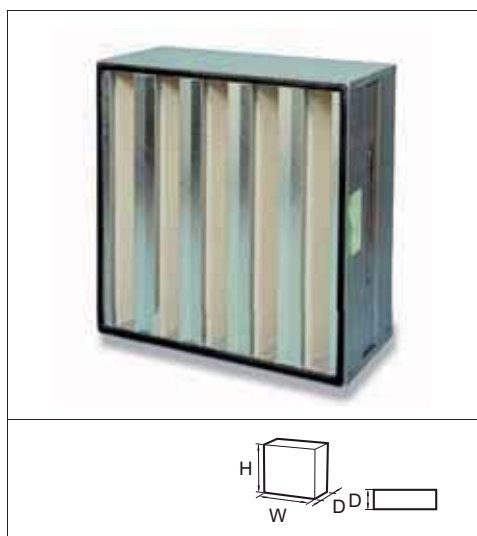
Temperature / Humidity: 70°C / 100% RH.

Remarks: All filters scan tested acc. EN 1822.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
1408037	DG13-305x610x292-P0-0W-V	305 x 610 x 292	H13	19.8	1500/250	8.5	0.075
1408038	DG13-610x610x292-P0-0W-V	610 x 610 x 292	H13	39.9	3000/250	12	0.143
1408039	DG13-762x610x292-P0-0W-V	762 x 610 x 292	H13	50.1	3750/250	15.5	0.178
1408040	DG14-305x610x292-P0-0W-V	305 x 610 x 292	H14	19.8	1300/250	8.5	0.075
1408041	DG14-610x610x292-P0-0W-V	610 x 610 x 292	H14	39.9	2600/250	12	0.143
1408042	DG14-762x610x292-P0-0W-V	762 x 610 x 292	H14	50.1	3300/250	15.5	0.178

* Other sizes and frames are available on request

Absolute™ VE XL, XXL - E11, H13, H14



Advantages

- High air flow rates, up to 5000 m³/hr
- Tested in accordance with EN 1822
- Handle to assist with filter changes
- High filter surface area offers low pressure drop for energy savings and longer life
- H13 and H14 are individually tested

Application: Very high efficiency final filtration in air conditioning systems, housings and diffusers.

Type: High air flow HEPA filter.

Frame: Galvanised steel.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Gasket: Endless polyurethane gasket.

EN 1822:2009 filter class: E11, H13 and H14.

MPPS efficiency: E11: ≥ 95%, H13: ≥ 99.95%, H14: ≥ 99.995%.

DOP efficiency: ≥ 99%.

Recommended final pressure drop: 600 Pa.

Maximum air flow rate: See table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

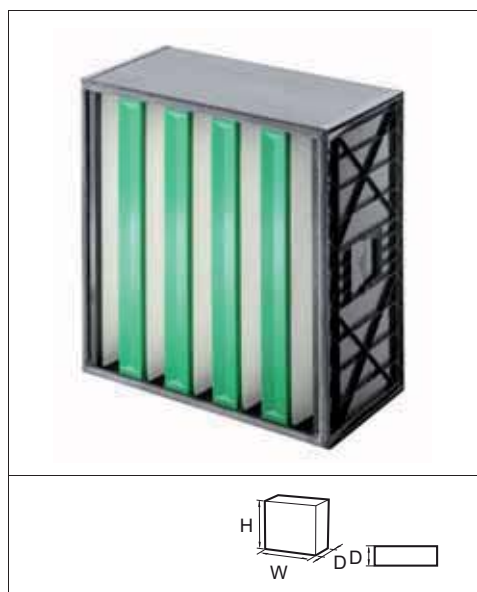
Mounting systems: Front and side access filter frames, FC Housings, terminal housings and safe change systems.

Fire rating: DIN 53438 class F1.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / Pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
1700010	VEXL11-289x595x292-PR	289 x 595 x 292	E11	16	1700/250	13	0.14
1700009	VEXL11-595x595x292-PR	595 x 595 x 292	E11	38	4200/250	22	0.07
1700007	VEXL11-610x610x292-PR	610 x 610 x 292	E11	21	4000/250	13	0.14
1700008	VEXXL11-305x610x292-PR	305 x 610 x 292	E11	14	2000/250	9	0.07
1700006	VEXXL11-610x610x292-PR	610 x 610 x 292	E11	35	5000/250	16.5	0.14
1700002	VEL13-610x610x292-PR-S	610 x 610 x 292	H13	33	3400/250	16.5	0.14
1700005	VEXL13-289x595x292-PR-S	289 x 595 x 292	H13	16	1300/250	8.5	0.07
1700003	VEXL13-305x610x292-PR-S	305 x 610 x 292	H13	16	1700/250	9	0.07
1700004	VEXL13-595x595x292-PR-S	595 x 595 x 292	H13	38	3200/250	15.5	0.14
1700001	VEXL13-610x610x292-PR-S	610 x 610 x 292	H13	40	4000/250	16.5	0.14
1700013	VEXL14-305x610x292-PR-S	305 x 610 x 292	H14	16	1500/250	9	0.07
1700011	VEXL14-610x610x292-PR-S	610 x 610 x 292	H14	40	3000/250	16.5	0.14
1700018	VEXL14-305x610x292-PR-S	305 x 610 x 292	H14	16	1700/250	13	0.07
1700016	VEXL14-610x610x292-PR-S	610 x 610 x 292	H14	40	3400/250	16.5	0.14

* Other sizes, stainless steel or aluminium frames are available on request.

Absolute™ VG XL, XXL - E11, H13, H14



Advantages

- High air flow - low pressure drop
- Compact design concept
- High efficiency
- Halogen free
- VDI 6022
- Up to 6000 m³/h
- Integrated handle
- H13 and H14 are individually tested

Application: Very high efficiency final filtration in air conditioning systems, housings or diffusers.

Type: EPA/HEPA-Filter.

Frame: ABS plastic with ergonomic handle.

Gasket: Endless polyurethane.

Media: Glass fibre.

Separators: Hot melt beads.

Sealant: Polyurethane (2-K-sealant).

EN 1822:2009 filter class: E11, H13, H14.

MPPS efficiency: E11: ≥ 95% - H13: ≥ 99.95%, H14: ≥ 99.995%.

Recommended final pressure drop: 600 Pa.

Temperature / Humidity: 70°C in continuous service.

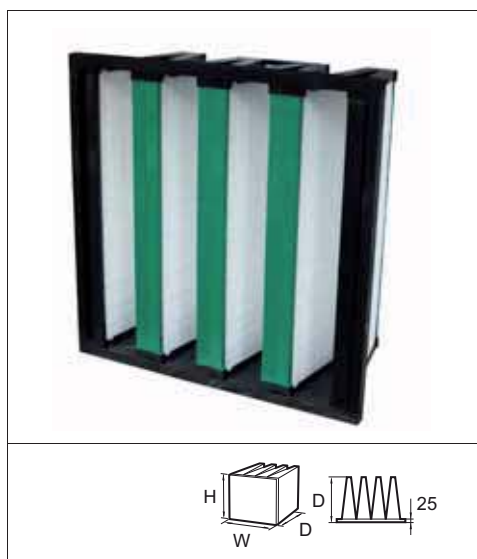
Mounting systems: Housing FKB, mounting frame 4N, CamSafe2.

Items

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m²	Air flow / Pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
1705008	VGXL11-610x610x292-PR	610 x 610 x 292	E11	21	4000/250	10	0.14
1705009	VGXXL11-305x610x292-PR	305 x 610 x 292	E11	14	2000/250	5	0.07
1705007	VGXXL11-610x610x292-PR	610 x 610 x 292	E11	35	5000/250	11	0.14
1705002	VGL13-610x610x292-PR-S	610 x 610 x 292	H13	33	3400/250	11	0.14
1705003	VGXL13-305x610x292-PR-S	305 x 610 x 292	H13	16	1700/250	5	0.07
1705001	VGXL13-610x610x292-PR-S	610 x 610 x 292	H13	40	4000/250	11	0.14
1705006	VGXL13-762x610x292-PR-S	762 x 610 x 292	H13	46	6000/380	14	0.17
1705014	VGXL14-305x610x292-PR-S	305 x 610 x 292	H14	16	1500/250	5	0.07
1705013	VGXL14-610x610x292-PR-S	610 x 610 x 292	H14	40	3000/250	11	0.14
1705016	VGXL14-305x610x292-PR-S	305 x 610 x 292	H14	16	1700/250	5	0.07
1705015	VGXL14-610x610x292-PR-S	610 x 610 x 292	H14	40	3400/250	11	0.14

* Other sizes, stainless steel or aluminium frames are available on request.

Absolute™ VG HF - E10, H13



Advantages

- Easy to install
- Incinerable
- Light weight
- Also available with endless polyurethane at outlet for H13
- H13 are individually tested

Application: Very high efficiency final filtration for air conditioning systems, housings or diffusers.

Type: Very high efficiency incinerable.

Frame: Polypropylene and ABS.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

EN 1822:2009 filter class: E10, H13.

MPPS efficiency: E10: $\geq 85\%$, H13: $\geq 99.95\%$.

DOP efficiency: $\geq 95\%$.

Recommended final pressure drop: 450 Pa.

Maximum flow rate: See table use nominal values otherwise a reduction in efficiency may occur.

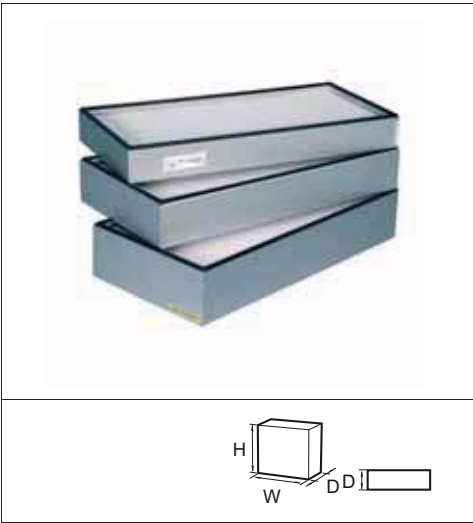
Temperature: 70°C maximum in continuous service.

Holding Frames: Front and side access housings and frames are available. Type 8 and FC housings.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
2430003	VGHF10-592x287x292	592 x 287 x 292	E10	8.4	1700/250	3	0.06
2430002	VGHF10-592x490x292	592 x 490 x 292	E10	15.2	2850/250	4	0.13
2430001	VGHF10-592x592x292	592 x 592 x 292	E10	18.5	4000/250	5	0.13
2440002	VGHF13-592x287x292-0P-S	592 x 287 x 292	H13	13.1	1350/250	3	0.06
2440003	VGHF13-592x490x292-0P-S	592 x 490 x 292	H13	24.2	2450/250	4	0.13
2440001	VGHF13-592x592x292-0P-S	592 x 592 x 292	H13	29.6	3000/250	5	0.13

*Gasket available on request.

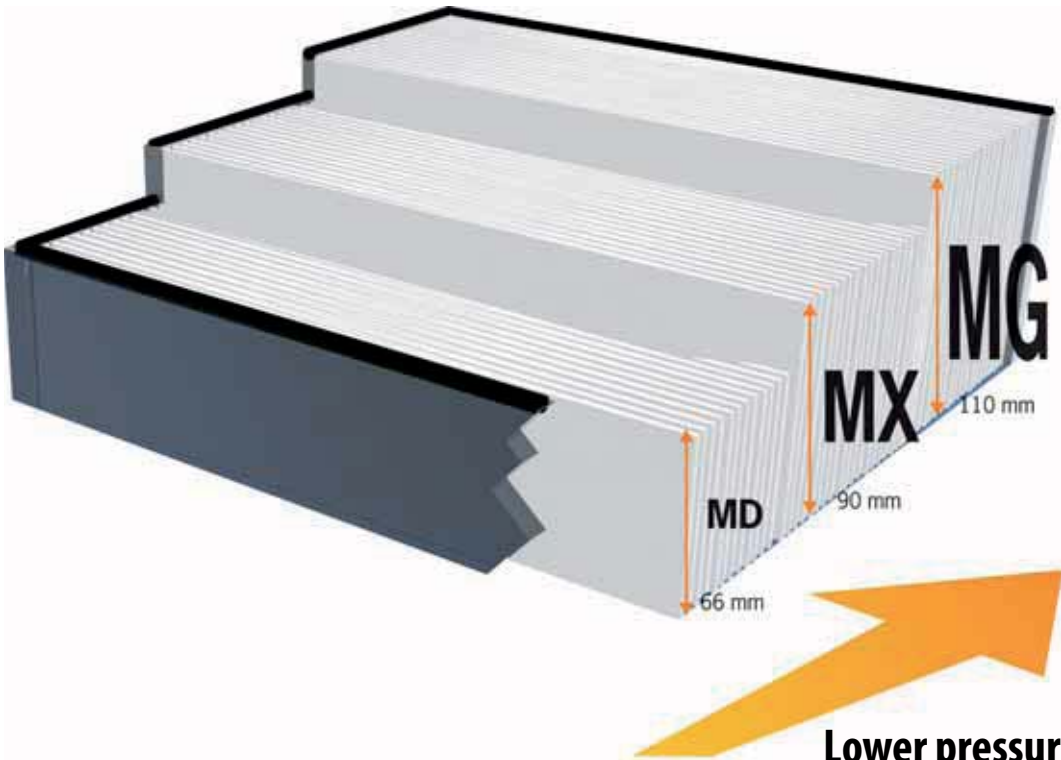
Megalam MD, MX, MG



Advantages

- Low pressure drop
- Low noise
- Higher flow rate
- Longer operating life

Example: Megalam H14 / 610x610 mm			
	MD	MX	MG
Filter area	10m ²	12.5m ²	18m ²
Pressure drop at 0.45 m/s	140 Pa	95 Pa (-32%)	65 Pa (-54%)
Maximum airflow	900 m ³ /h	1300 m ³ /h	2000 m ³ /h
Energy		-32%	-54%
Lifespan	(-)	x 1.5	x 2.5



Lower pressure drop
Higher airflow rate
More energy savings
Longer operating life

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Megalam Configurations Options

We have included a range of standard configurations in this catalogue, but the Megalam series of clean room panels can be configured with a wide range of options to meet your requirement. Options include (first item denotes the standard product):

Element	Options
Gasket	<ul style="list-style-type: none"> - Endless Polyurethane - Poron - Neoprene - PU Gel - Silicone Gel - None
Faceguard	<ul style="list-style-type: none"> - RAL 9016 powder coated hot dip galvanized iron - Custom color powder coated hot dip galvanized iron - Stainless steel - Anodized aluminium - None
Frame type	<ul style="list-style-type: none"> - Anodized aluminium - Anodized aluminium knife type
High performance airflow distribution	<ul style="list-style-type: none"> - Glass fibre screen - Synthetic screen
Filter efficiency	<ul style="list-style-type: none"> - E10 - U17 according to EN1822 - Rating at 0.3µm or 0.12µm
Test Aerosol	<ul style="list-style-type: none"> - DEHS (liquid) - PSL (solid) - None
Fire Rating	<ul style="list-style-type: none"> - DIN 53438 - UL 900 - FM 4920
Media Options	<ul style="list-style-type: none"> - Glass fibre media - Boron-free glass fibre media - Membrane media

HEPA/ULPA Panels

Profiles for Megalam Filter



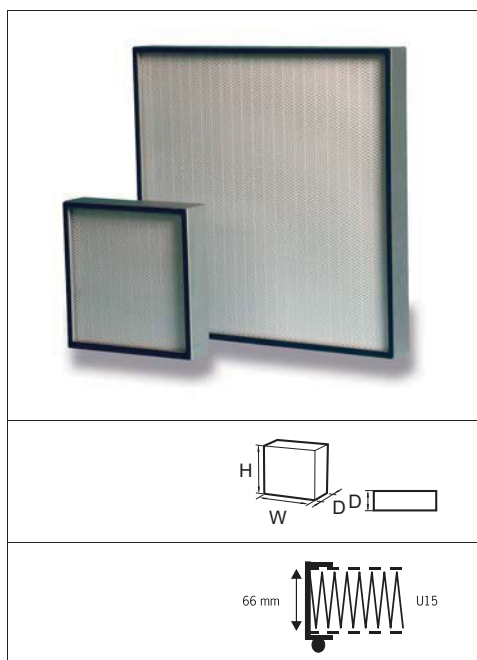
Extruded aluminium frames for megalam filters

This overview shows the different standard frame profiles available.

Seal	Frame		
	Filter Type:MD	MX	MG
GASKET			
LIQUID SEAL			
LIQUID SEAL			
KNIFE EDGE			

* Other profile configurations are available upon request.

Megalam MD - H13 to U15



Advantages

- Low pressure drop
- Double faceguard
- Individually tested according to EN 1822
- Guaranteed performance
- Laminarity better than +/- 20%

Application: Final or return filtration for clean rooms with turbulent flow.

Type: High efficiency filter panel with seal for mechanical clamping mounting systems.

Frame: Extruded and anodized aluminium.

Gasket: Endless polyurethane at inlet.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Faceguard: Expanded metal on both sides, powder coated with RAL 9016.

EN 1822:2009 filter class: H13, H14, U15.

MPPS efficiency: H13: $\geq 99.95\%$, H14: $\geq 99.995\%$, U15: $\geq 99.9995\%$.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: See table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

Test: 100% individually tested according to EN 1822.

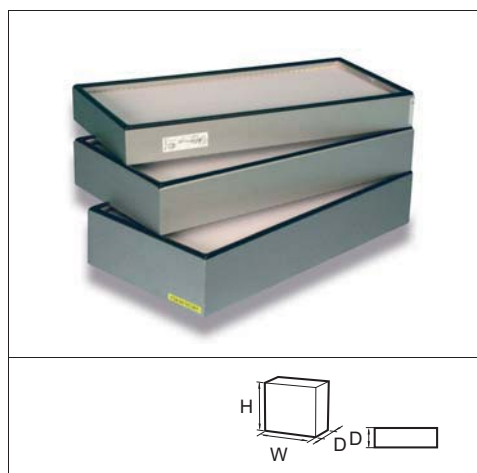
Mounting system: Mechanical clamping structure, Terminal housings.

Fire rating: UL 900, FM 4920 approval on request.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
15002001	MD13- 305*305-10/22	305 x 305 x 66	H13	2.4	151/115	1	0.01
15002002	MD13- 305*610-10/22	305 x 610 x 66	H13	4.8	301/115	2	0.02
15002003	MD13- 610*610-10/22	610 x 610 x 66	H13	9.7	603/115	4	0.03
15002004	MD13- 762*610-10/22	762 x 610 x 66	H13	12.2	753/115	5	0.04
15002005	MD13- 914*610-10/22	914 x 610 x 66	H13	14.6	903/110	6	0.05
15002006	MD13- 1219*610-10/22	1219 x 610 x 66	H13	19.5	1205/110	8	0.07
15002007	MD13- 1524*610-10/22	1524 x 610 x 66	H13	24.5	1506/110	10	0.09
15002008	MD13- 914*762-10/22	914 x 762 x 66	H13	18.4	1128/110	7.5	0.07
15002009	MD13- 1219*762-10/22	1219 x 762 x 66	H13	24.5	1505/110	10	0.09
15002010	MD13- 1524*762-10/22	1524 x 762 x 66	H13	30.7	1881/110	12.5	0.11
15002011	MD13- 914*914-10/22	914 x 914 x 66	H13	22.1	1353/110	9	0.08
15002201	MD14- 305*305-10/22	305 x 305 x 66	H14	2.4	151/145	1	0.01
15002202	MD14- 305*610-10/22	305 x 610 x 66	H14	4.8	301/140	2	0.02
15002203	MD14- 610*610-10/22	610 x 610 x 66	H14	9.7	603/140	4	0.03
15002204	MD14- 762*610-10/22	762 x 610 x 66	H14	12.2	753/140	5	0.04
15002205	MD14- 914*610-10/22	914 x 610 x 66	H14	14.6	903/140	6	0.05
15002206	MD14- 1219*610-10/22	1219 x 610 x 66	H14	19.5	1205/140	8	0.07
15002207	MD14- 1524*610-10/22	1524 x 610 x 66	H14	24.5	1506/140	10	0.09
15002208	MD14- 914*762-10/22	914 x 762 x 66	H14	18.4	1128/135	7.5	0.07
15002209	MD14- 1219*762-10/22	1219 x 762 x 66	H14	24.5	1505/135	10	0.09
15002210	MD14- 1524*762-10/22	1524 x 762 x 66	H14	30.7	1881/135	12.5	0.17
15002211	MD14- 914*914-10/22	914 x 914 x 66	H14	22.1	1353/135	9	0.08
15002401	MD15- 305*305-10/22	305 x 305 x 66	U15	2.7	151/150	1	0.01
15002402	MD15- 305*610-10/22	305 x 610 x 66	U15	5.6	301/145	2	0.02
15002403	MD15- 610*610-10/22	610 x 610 x 66	U15	11.3	603/145	4	0.03
15002404	MD15- 762*610-10/22	762 x 610 x 66	U15	14.2	753/145	5	0.04
15002405	MD15- 914*610-10/22	914 x 610 x 66	U15	17.1	903/145	6	0.05
15002406	MD15- 1219*610-10/22	1219 x 610 x 66	U15	22.7	1205/145	8	0.07
15002407	MD15- 1524*610-10/22	1524 x 610 x 66	U15	28.5	1506/140	10	0.09
15002408	MD15- 914*762-10/22	914 x 762 x 66	U15	21.4	1128/140	7.5	0.07
15002409	MD15- 1219*762-10/22	1219 x 762 x 66	U15	28.5	1505/140	10	0.09
15002410	MD15- 1524*762-10/22	1524 x 762 x 66	U15	35.7	1881/140	12.5	0.11
15002411	MD15- 914*914-10/22	914 x 914 x 66	U15	26	1353/140	9	0.08

*Other sizes are available on request.

Megalam MX - H14 to U15



Advantages

- Low pressure drop
- Higher flow rate
- Longer operating life
- Individually tested according to EN 1822
- Laminarity better than +/- 20%

Application: Final or return filtration for clean rooms with turbulent flow.

Type: High efficiency filter panel with seal for mechanical clamping systems.

Frame: Extruded and anodised aluminium.

Gasket: Polyurethane endless at inlet.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Faceguard: Expanded metal on both side, powder coated RAL 9016.

EN 1822:2009 filter class: H14, U15.

MPPS efficiency: H14: $\geq 99.995\%$, U15: $\geq 99.9995\%$.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: see table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

Test: 100% individually tested according to EN 1822.

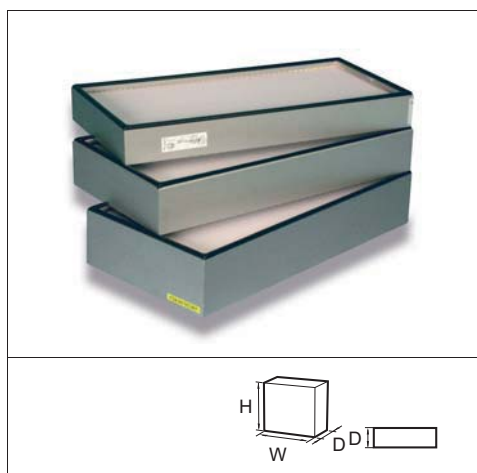
Mounting system: Mechanical clamping structure, Terminal housing.

Fire rating: UL 900, FM 4920 approval on request.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
15002801	MX14- 305*305-10/22	305 x 305 x 90	H14	3.2	151/95	1.4	0.01
15002802	MX14- 305*610-10/22	305 x 610 x 90	H14	6.6	301/95	2.8	0.02
15002803	MX14- 610*610-10/22	610 x 610 x 90	H14	13.2	603/95	5.6	0.04
15002804	MX14- 762*610-10/22	762 x 610 x 90	H14	16.5	753/95	7	0.05
15002805	MX14- 914*610-10/22	914 x 610 x 90	H14	20.2	903/95	8.4	0.07
15002806	MX14- 1219*610-10/22	1219 x 610 x 90	H14	27	1205/95	11.2	0.09
15002807	MX14- 1524*610-10/22	1524 x 610 x 90	H14	33.2	1506/95	14	0.12
15002808	MX14- 914*762-10/22	914 x 762 x 90	H14	25.2	1128/95	10.5	0.09
15002809	MX14- 1219*762-10/22	1219 x 762 x 90	H14	33.4	1505/95	14	0.12
15002810	MX14- 1524*762-10/22	1524 x 762 x 90	H14	42.2	1881/95	17.5	0.14
15002811	MX14- 914*914-10/22	914 x 914 x 90	H14	30	1353/95	12.6	0.1
15003001	MX15- 305*305-10/22	305 x 305 x 90	U15	3.7	151/115	1.4	0.01
15003002	MX15- 305*610-10/22	305 x 610 x 90	U15	7.5	301/115	2.8	0.02
15003003	MX15- 610*610-10/22	610 x 610 x 90	U15	15.2	603/115	5.6	0.04
15003004	MX15- 762*610-10/22	762 x 610 x 90	U15	19	753/115	7	0.06
15003005	MX15- 914*610-10/22	914 x 610 x 90	U15	23.1	903/115	8.4	0.07
15003006	MX15- 1219*610-10/22	1219 x 610 x 90	U15	30.5	1205/115	11.2	0.09
15003007	MX15- 1524*610-10/22	1524 x 610 x 90	U15	38.1	1506/115	14	0.12
15003008	MX15- 914*762-10/22	914 x 762 x 90	U15	28.6	1128/115	10.5	0.09
15003009	MX15- 1219*762-10/22	1219 x 762 x 90	U15	38.2	1505/110	14	0.12
15003010	MX15- 1524*762-10/22	1524 x 762 x 90	U15	48.4	1881/110	17.5	0.14
15003011	MX15- 914*914-10/22	914 x 914 x 90	U15	34.4	1353/110	12.6	0.1

* Other sizes are available on request.

Megalam MG - H14 to U15



Advantages

- Low pressure drop
- Double faceguard
- Longer operating life
- Individually tested according to EN 1822
- Laminarity better +/-20%

Application: Final or return filtration for clean rooms with turbulent flow.

Type: High efficiency filter panel for mechanical clamping systems.

Frame: Extruded and anodised aluminium.

Gasket: Polyurethane endless at inlet.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Faceguard: Expanded metal on both side, powder coated RAL 9016.

EN 1822:2009 filter class: H14, U15.

MPPS efficiency: H14: $\geq 99.995\%$, U15: $\geq 99.9995\%$.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: See table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

Test: 100% individually tested according to EN 1822.

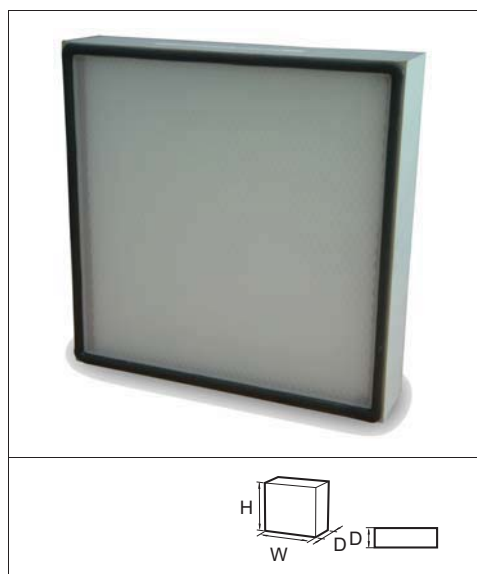
Mounting system: Mechanical clamping structure, Terminal housing.

Fire rating: UL 900, FM 4920 approval on request.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
15003401	MG14- 305*305-10/22	305 x 305 x 110	H14	4.2	151/65	1.7	0.02
15003402	MG14- 305*610-10/22	305 x 610 x 110	H14	8.7	301/65	2.9	0.03
15003403	MG14- 610*610-10/22	610 x 610 x 110	H14	17.5	603/65	5.3	0.06
15003404	MG14- 762*610-10/22	762 x 610 x 110	H14	22.2	753/60	6.5	0.07
15003405	MG14- 914*610-10/22	914 x 610 x 110	H14	26.3	903/60	7.7	0.09
15003406	MG14- 1219*610-10/22	1219 x 610 x 110	H14	35.2	1205/60	10	0.14
15003407	MG14- 1524*610-10/22	1524 x 610 x 110	H14	44	1506/60	12.4	0.14
15003408	MG14- 914*762-10/22	914 x 762 x 110	H14	33.4	1128/60	9.4	0.11
15003409	MG14- 1219*762-10/22	1219 x 762 x 110	H14	44.2	1505/60	12.4	0.14
15003410	MG14- 1524*762-10/22	1524 x 762 x 110	H14	55.2	1881/60	15.4	0.14
15003411	MG14- 914*914-10/22	914 x 914 x 110	H14	40.1	1353/60	11.2	0.13
15003601	MG15- 305*305-10/22	305 x 305 x 110	U15	4.6	151/80	1.7	0.02
15003602	MG15- 305*610-10/22	305 x 610 x 110	U15	9.3	301/80	2.9	0.03
15003603	MG15- 610*610-10/22	610 x 610 x 110	U15	19	603/80	5.3	0.06
15003604	MG15- 762*610-10/22	762 x 610 x 110	U15	23.5	753/80	6.5	0.07
15003605	MG15- 914*610-10/22	914 x 610 x 110	U15	28.2	903/80	7.7	0.09
15003606	MG15- 1219*610-10/22	1219 x 610 x 110	U15	38.4	1205/80	10	0.11
15003607	MG15- 1524*610-10/22	1524 x 610 x 110	U15	48	1506/80	12.4	0.14
15003608	MG15- 914*762-10/22	914 x 762 x 110	U15	35.4	1128/80	9.4	0.11
15003609	MG15- 1219*762-10/22	1219 x 762 x 110	U15	48	1505/80	12.4	0.14
15003610	MG15- 1524*762-10/22	1524 x 762 x 110	U15	60	1881/80	15.4	0.14
15003611	MG15- 914*914-10/22	914 x 914 x 110	U15	43	1353/80	11.2	0.13

* Other sizes are available on request.

Megalam (Laminator) MDL, MXL, MGL - H14 to U15



Advantages

- Laminarity better than +/- 10%
- Low pressure drop
- Single faceguard
- Longer operating life
- Individually tested according to EN 1822

Application: Final or return filtration for clean rooms with turbulent flow.

Type: High efficiency filter panel with laminator and seal for mechanical clamping systems.

Frame: Extruded and anodized aluminium.

Gasket: Polyurethane endless at outlet.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Laminator: Glass fibre screen, bonded downstream for laminar diffusion.

Faceguard: Expanded metal at inlet side, powder coated RAL 9016.

EN 1822:2009 filter class: H14, U15.

MPPS efficiency: H14: $\geq 99.995\%$, U15: $\geq 99.9995\%$.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: See table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

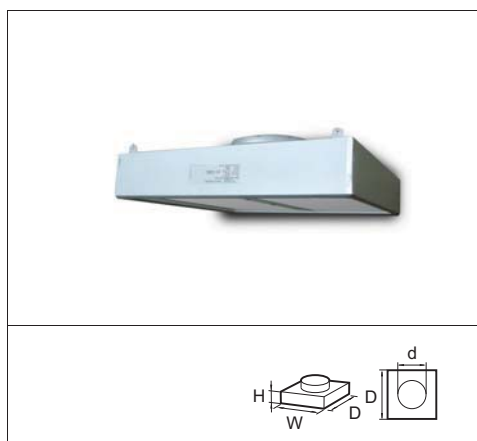
Mounting system: Mechanical clamping structure, Terminal housing.

Fire rating: UL 900, FM 4920 approval on request.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
15000203	MDL14- 610*610-01/20	610 x 610 x 66	H14	9.7	603/155	4	0.03
15000206	MDL14- 1219*610-01/20	1219 x 610 x 66	H14	19.5	1205/155	8	0.07
15000403	MDL15- 610*610-01/20	610 x 610 x 66	U15	11.3	603/160	4	0.03
15000406	MDL15- 1219*610-01/20	1219 x 610 x 66	U15	23.1	1205/160	8	0.07
15000803	MXL14- 610*610-01/20	610 x 610 x 90	H14	13.2	603/110	5.6	0.03
15000806	MXL14- 1219*610-01/20	1219 x 610 x 90	H14	26.6	1205/110	11.2	0.07
15001003	MXL15- 610*610-01/20	610 x 610 x 90	U15	15.2	603/130	5.6	0.03
15001006	MXL15- 1219*610-01/20	1219 x 610 x 90	U15	30.5	1205/130	11.2	0.07
15001403	MGL14- 610*610-01/20	610 x 610 x 110	H14	17.5	603/75	5.3	0.04
15001406	MGL14- 1219*610-01/20	1219 x 610 x 110	H14	35.2	1205/70	10	0.08
15001603	MGL15- 610*610-01/20	610 x 610 x 110	U15	18.8	603/95	5.3	0.04
15001606	MGL15- 1219*610-01/20	1219 x 610 x 110	U15	37.8	1205/90	10	0.08

*Other sizes are available on request.

Silent Hood HD - H13 to U15



Advantages

- Compact filter-diffuser for clean room
- Ready to install
- Low noise
- Test port
- Laminarity +/- 20%
- Non-slip collar design
- Roomside adjustable diffuser disc

Application: Final filtration for clean rooms.

Type: Ready to install HEPA/ULPA filter diffuser.

Frame: Extruded and anodised aluminium, galvanised steel cover.

Gasket: Endless PU.

Media: Glass fibre paper.

Separator: Hot melt beads.

Sealant: Polyurethane.

Terminal: Collar with outer dia. 305 mm (12in) or 210 mm (10in) depending on the model.

Diffuser disc: Perforated aluminium.

Faceguard: Expanded metal on outlet, powder coated RAL 9016.

EN 1822:2009 filter class: H13, H14, U15.

MPPS efficiency: H13: ≥99.95%, H14: ≥99.995% U15: ≥99.9995%.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: See table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

Test: 100% individually scanned in accordance with EN 1822.

Mounting system: Integrated suspension eyes.

Fire rating: UL 900, FM 4920 approval on request.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow/nominal pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
15300001	MD13-HD10-610*610-01/02	610 x 610 x 110	H13	9.7	603/130	13	0.07
15300002	MD13-HD10-914*610-01/02	914 x 610 x 110	H13	14.6	903/125	16	0.11
15300003	MD13-HD10-1219*610-01/02	1219 x 610 x 110	H13	19.5	1205/125	19	0.15
15300004	MD13-HD10-600*600-01/02	600 x 600 x 110	H13	9.4	583/130	13	0.07
15300005	MD13-HD10-905*600-01/02	905 x 600 x 110	H13	14.2	880/130	16	0.11
15300006	MD13-HD10-1210*600-01/02	1210 x 600 x 110	H13	19.1	1176/125	19	0.15
15300101	MD14-HD10-610*610-01/02	610 x 610 x 110	H14	9.7	603/155	13	0.07
15300102	MD14-HD10-914*610-01/02	914 x 610 x 110	H14	14.6	903/155	16	0.11
15300103	MD14-HD10-1219*610-01/02	1219 x 610 x 110	H14	19.5	1205/155	19	0.15
15300104	MD14-HD10-600*600-01/02	600 x 600 x 110	H14	9.4	583/155	13	0.07
15300105	MD14-HD10-905*600-01/02	905 x 600 x 110	H14	14.2	880/155	16	0.11
15300106	MD14-HD10-1210*600-01/02	1210 x 600 x 110	H14	19.1	1176/155	19	0.15
15300201	MD15-HD10-610*610-01/02	610 x 610 x 110	U15	11.3	603/160	13	0.07
15300202	MD15-HD10-914*610-01/02	914 x 610 x 110	U15	17.1	903/160	16	0.11
15300203	MD15-HD10-1219*610-01/02	1219 x 610 x 110	U15	22.7	1205/160	19	0.15
15300204	MD15-HD10-600*600-01/02	600 x 600 x 110	U15	11	583/160	13	0.07
15300205	MD15-HD10-905*600-01/02	905 x 600 x 110	U15	16.6	880/160	16	0.11
15300206	MD15-HD10-1210*600-01/02	1210 x 600 x 110	U15	22.2	1176/160	19	0.15
15300401	MX14-HD10-610*610-01/02	610 x 610 x 133	H14	13.2	603/110	15	0.09
15300402	MX14-HD10-914*610-01/02	914 x 610 x 133	H14	19.9	903/110	19	0.13
15300403	MX14-HD10-1219*610-01/02	1219 x 610 x 133	H14	26.6	1205/110	22	0.18
15300404	MX14-HD10-600*600-01/02	600 x 600 x 133	H14	12.8	583/110	15	0.09

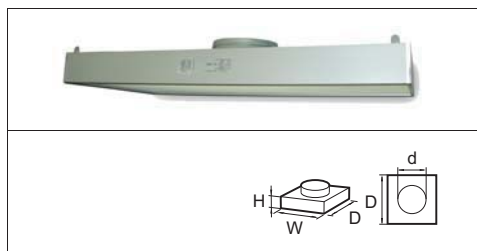
* Other sizes are available on request.

HEPA/ULPA Panels

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow/nominal pressure drop m ³ /h/Pa	Unit weight kg	unit volume m ³
15300405	MX14-HD10-905*600-01/02	905 x 600 x 133	H14	19.4	880/110	19	0.13
15300406	MX14-HD10-1210*600-01/02	1210 x 600 x 133	H14	25.9	1176/110	22	0.18
15300501	MX15-HD10-610*610-01/02	610 x 610 x 133	U15	15.2	603/130	15	0.09
15300502	MX15-HD10-914*610-01/02	914 x 610 x 133	U15	22.8	903/130	19	0.13
15300503	MX15-HD10-1219*610-01/02	1219 x 610 x 133	U15	30.5	1205/130	22	0.18
15300504	MX15-HD10-600*600-01/02	600 x 600 x 133	U15	14.7	583/130	15	0.09
15300505	MX15-HD10-905*600-01/02	905 x 600 x 133	U15	22.2	880/130	19	0.13
15300506	MX15-HD10-1210*600-01/02	1210 x 600 x 133	U15	29.7	1176/130	22	0.18
15300701	MG14-HD10-610*610-01/02	610 x 610 x 155	H14	17.1	603/80	18	0.1
15300703	MG14-HD10-1219*610-01/02	1219 x 610 x 155	H14	34.7	1205/80	26	0.21
15300801	MG15-HD10-610*610-01/02	610 x 610 x 155	U15	18.3	603/100	18	0.1
15300803	MG15-HD10-1219*610-01/02	1219 x 610 x 155	U15	37.3	1205/95	26	0.21
15301001	MD13-HD12- 610*610-01/02	610 x 610 x 110	H13	9.7	603/130	13	0.07
15301002	MD13-HD12- 914*610-01/02	914 x 610 x 110	H13	14.6	903/125	16	0.11
15301003	MD13-HD12-1219* 610-01/02	1219 x 610 x 110	H13	19.5	1205/125	19	0.15
15301004	MD13-HD12- 600*600-01/02	600 x 600 x 110	H13	9.4	583/130	13	0.07
15301005	MD13-HD12- 905*600-01/02	905 x 600 x 110	H13	14.2	880/130	16	0.11
15301006	MD13-HD12-1210* 600-01/02	1210 x 600 x 110	H13	19.1	1176/125	19	0.15
15301101	MD14-HD12- 610*610-01/02	610 x 610 x 110	H14	9.7	603/155	13	0.07
15301102	MD14-HD12- 914*610-01/02	914 x 610 x 110	H14	14.6	903/155	16	0.11
15301103	MD14-HD12-1219*610-01/02	1219 x 610 x 110	H14	19.5	1205/155	19	0.15
15301104	MD14-HD12- 600*600-01/02	600 x 600 x 110	H14	9.4	583/155	13	0.07
15301105	MD14-HD12 905*600-01/02	905 x 600 x 110	H14	14.2	880/155	16	0.11
15301106	MD14-HD12-1210*600-01/02	1210 x 600 x 110	H14	19.1	1176/155	19	0.15
15301201	MD15-HD12-610*610-01/02	610 x 610 x 110	U15	11.3	603/160	13	0.07
15301202	MD15-HD12-610*610-01/02	914 x 610 x 110	U15	17.1	903/160	16	0.11
15301203	MD15-HD12-1219*610-01/02	1219 x 610 x 110	U15	22.7	1205/160	19	0.15
15301204	MD15-HD12-600*600-01/02	600 x 600 x 110	U15	11	583/160	13	0.07
15301205	MD15-HD12-905*600-01/02	905 x 600 x 110	U15	16.6	880/160	16	0.11
15301206	MD15-HD12-1210*600-01/02	1210 x 600 x 110	U15	22.2	1176/160	19	0.15
15301401	MX14-HD12 610*610-01/02	610 x 610 x 133	H14	13.2	603/110	15	0.09
15301402	MX14-HD12 914*610-01/02	914 x 610 x 133	H14	19.9	903/110	19	0.13
15301403	MX14-HD12-1219*610-01/02	1219 x 610 x 133	H14	26.6	1205/110	22	0.18
15301404	MX14-HD12 600*600-01/02	600 x 600 x 133	H14	12.8	583/110	15	0.09
15301405	MX14-HD14 905*600-01/02	905 x 600 x 133	H14	19.4	880/110	19	0.13
15301406	MX14-HD12-1210*600-01/02	1210 x 600 x 133	H14	25.9	1176/110	22	0.18
15301501	MX15-HD12-610*610-01/02	610 x 610 x 133	U15	15.2	603/130	15	0.09
15301502	MX15-HD12-914*610-01/02	914 x 610 x 133	U15	22.8	903/130	19	0.13
15301503	MX15-HD12-1219*610-01/02	1219 x 610 x 133	U15	30.5	1205/130	22	0.18
15301504	MX15-HD12-600*600-01/02	600 x 600 x 133	U15	14.7	583/130	15	0.09
15301505	MX15-HD12-905*600-01/02	905 x 600 x 133	U15	22.2	880/130	19	0.13
15301506	MX15-HD12-1210*600-01/02	1210 x 600 x 133	U15	29.7	1176/130	22	0.18
15301701	MG14-HD12-610*610-01/02	610 x 610 x 155	H14	17.1	603/80	18	0.1
15301703	MG14-HD12-1219*610-01/02	1219 x 610 x 155	H14	34.7	1205/80	26	0.21
15301801	MG15-HD12-610*610-01/02	610 x 610 x 155	U15	18.3	603/100	18	0.1
15301803	MG15-HD12-1219*610-01/02	1219 x 610 x 155	U15	37.3	1205/95	26	0.21

* Other sizes are available on request.

Silent Hood HL - H13 to U15



Advantages

- Compact filter-diffuser for clean room
- Ready to install
- Quiet: LW = 35 dB
- Laminarity +/- 20%

Application: Final filtration for clean rooms.

Type: Ready to install HEPA/ULPA filter diffuser.

Frame: Extruded and anodised aluminium, galvanised steel cover.

Gasket: Endless PU.

Media: Glass fibre paper.

Separator: Hot melt beads.

Sealant: Polyurethane.

Terminal: Collar with outer dia. 305 mm (12in) or 250 mm (10in) depending on the model.

Faceguard: Expanded metal powder coated RAL 9016.

EN 1822:2009 filter class: H13, H14, U15.

MPPS efficiency: H13: ≥99.95%, H14: ≥99.995%, U15: ≥99.9995%.

Recommended final pressure drop: 500 Pa.

Maximum flow rate: See table, use nominal values otherwise a reduction in efficiency may occur.

Temperature: 70°C maximum in continuous service.

Test: 100% individually scanned in accordance with EN 1822.

Mounting system: Integrated suspension eyes.

Fire rating: UL 900, FM 4920 approval on request.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
15401001	MD13-HL10-610*610-01/02	610 x 610 x 110	H13	9.9	603/130	13	0.09
15401002	MD13-HL10-914*610-01/02	914 x 610 x 110	H13	14.9	903/125	16	0.18
15401003	MD13-HL10-1219*610-01/02	1219 x 610 x 110	H13	19.9	1205/125	19	0.18
15401004	MD13-HL10-600*600-01/02	600 x 600 x 110	H13	9.6	583/130	13	0.09
15401005	MD13-HL10-905*600-01/02	905 x 600 x 110	H13	14.5	880/130	16	0.18
15401006	MD13-HL10-1210*600-01/02	1210 x 600 x 110	H13	19.4	1176/125	19	0.18
15401101	MD14-HL10-610*610-01/02	610 x 610 x 110	H14	9.9	603/155	13	0.09
15401102	MD14-HL10 914*610-01/02	914 x 610 x 110	H14	14.9	903/155	16	0.18
15401103	MD14-HL10-1219*610-01/02	1219 x 610 x 110	H14	19.9	1205/155	19	0.18
15401104	MD14-HL10 600*600-01/02	600 x 600 x 110	H14	9.6	583/155	13	0.09
15401105	MD14-HL10 905*600-01/02	905 x 600 x 110	H14	14.5	880/155	16	0.18
15401106	MD14-HL10-1210*600-01/02	1210 x 600 x 110	H14	19.4	1176/155	19	0.18
15401201	MD15-HL10-610*610-01/02	610 x 610 x 110	U15	11.5	603/160	13	0.09
15401202	MD15-HL10-914*610-01/02	914 x 610 x 110	U15	17.3	903/160	16	0.18
15401203	MD15-HL10-1219*610-01/02	1219 x 610 x 110	U15	23.1	1205/160	19	0.18
15401204	MD15-HL10-600*600-01/02	600 x 600 x 110	U15	11.2	583/160	13	0.09
15401205	MD15-HL10-905*600-01/02	905 x 600 x 110	U15	16.9	880/160	16	0.18
15401206	MD15-HL10-1210*600-01/02	1210 x 600 x 110	U15	22.6	1176/160	19	0.18
15401401	MX14-HL10 610*610-01/02	610 x 610 x 133	H14	13.4	603/110	13	0.09
15401402	MX14 HL10 914*610-01/02	914 x 610 x 133	H14	20.2	903/110	16	0.18
15401403	MX14-HL10-1219*610-01/02	1219 x 610 x 133	H14	24.0	1205/110	19	0.18
15401404	MX14-HL10 600*600-01/02	600 x 600 x 133	H14	13.1	583/110	13	0.09
15401405	MX14-HL10 905*600-01/02	905 x 600 x 133	H14	19.7	880/110	16	0.18
15401406	MX14-HL10-1210*600-01/02	1210 x 600 x 133	H14	26.3	1176/110	19	0.18
15401501	MX15- HL10-610*610-01/02	610 x 610 x 133	U15	15.4	603/130	13	0.09

* Other sizes are available on request.

HEPA/ULPA Panels

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow / pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
15401502	MX15- HL10-914*610-01/02	914 x 610 x 133	U15	23.2	903/130	16	0.18
15401503	MX15- HL10-1219*610-01/02	1219 x 610 x 133	U15	31.0	1205/130	19	0.18
15401504	MX15- HL10-600*600-01/02	600 x 600 x 133	U15	14.9	583/130	13	0.09
15401505	MX15 -HL10-905*600-01/02	905 x 600 x 133	U15	22.5	880/130	16	0.18
15401506	MX15- HL10-1210*600-01/02	1210 x 600 x 133	U15	30.2	1176/130	19	0.18
15403001	MD13-HL12-610*610-01/02	610 x 610 x 110	H13	9.9	603/130	13	0.09
15403002	MD13-HL12-914*610-01/02	914 x 610 x 110	H13	14.9	903/125	16	0.18
15403003	MD13-HL12-1219*610-01/02	1219 x 610 x 110	H13	19.9	1205/125	19	0.18
15403004	MD13-HL12-600*600-01/02	600 x 600 x 110	H13	9.6	583/130	13	0.09
15403005	MD13-HL12-905*600-01/02	905 x 600 x 110	H13	14.5	880/130	16	0.18
15403006	MD13-HL12-1210*600-01/02	1210 x 600 x 110	H13	19.4	1176/125	19	0.18
15403101	MD14-HL12 610*610-01/02	610 x 610 x 110	H14	9.9	603/155	13	0.09
15403102	MD14-HL12 914*610-01/02	914 x 610 x 110	H14	14.9	903/155	16	0.18
15403103	MD14-HL12-1219*610-01/02	1219 x 610 x 110	H14	19.9	1205/155	19	0.18
15403104	MD14-HL12 600*600-01/02	600 x 600 x 110	H14	9.6	583/155	13	0.09
15403105	MD14-HL12 905*600-01/02	905 x 600 x 110	H14	14.5	880/155	16	0.18
15403106	MD14-HL12-1210*600-01/02	1210 x 600 x 110	H14	19.4	1176/155	19	0.18
15403201	MD15-HL12-610*610-01/02	610 x 610 x 110	U15	11.5	603/160	13	0.09
15403202	MD15-HL12-914*610-01/02	914 x 610 x 110	U15	17.3	903/160	16	0.18
15403203	MD15-HL12-1219*610-01/02	1219 x 610 x 110	U15	23.1	1205/160	19	0.18
15403204	MD15-HL12-600*600-01/02	600 x 600 x 110	U15	11.2	583/160	13	0.09
15403205	MD15-HL12-905*600-01/02	905 x 600 x 110	U15	16.9	880/160	16	0.18
15403206	MD15-HL12-1210*600-01/02	1210 x 600 x 110	U15	22.6	1176/160	19	0.18
15403401	MX14-HL12 610*610-01/02	610 x 610 x 133	H14	13.4	603/110	13	0.09
15403402	MX14-HL12 914*610-01/02	914 x 610 x 133	H14	20.2	903/110	16	0.18
15403403	MX14-HL12-1219*610-01/02	1219 x 610 x 133	H14	27	1205/110	19	0.18
15403404	MX14-HL12 600*600-01/02	600 x 600 x 133	H14	13.1	583/110	13	0.09
15403405	MX14-HL12 905*600-01/02	905 x 600 x 133	H14	19.7	880/110	16	0.18
15403406	MX14-HL12-1210*600-01/02	1210 x 600 x 133	H14	26.3	1176/110	19	0.18
15403501	MX15 -HL12-610*610-01/02	610 x 610 x 133	U15	15.4	603/130	13	0.09
15403502	MX15 -HL12-914*610-01/02	914 x 610 x 133	U15	23.2	903/130	16	0.18
15403503	MX15- -HL12-1219*610-01/02	1219 x 610 x 133	U15	31	1205/130	19	0.18
15403504	MX15 -HL12-600*600-01/02	600 x 600 x 133	U15	14.9	583/130	13	0.09
15403505	MX15- -HL12-905*600-01/02	905 x 600 x 133	U15	22.5	880/130	16	0.18
15403506	MX15- -HL12-1210*600-01/02	1210 x 600 x 133	U15	30.2	1176/130	19	0.18

* Other sizes are available on request.

Summary Molecular Filtration



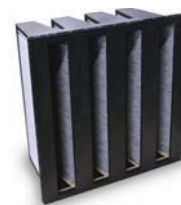
Compact 2 in 1 solution
CityPleat
Page 105



Compact 2 in 1 solution
CityFlo
Page 106



Compact 2 in 1 solution
CityCarb®
Page 107



Compact Molecular Filters
CitySorb
Page 108



Compact Molecular Filters
Riga-Carb
Page 109



Loose-Filled Panels
CamSure
Page 111



Loose-Filled Cylinders
CamCarb Green
Page 113



Loose-Filled Cylinders
CamCarb Metal
Page 114



Loose-Filled Cylinders
CamCarb Mounting Frames
(Baseplates)
Page 115



Loose-Filled Modules
CamPure® GDM Green
Disposable Modules
Page 116



AMC Control
Gigapleat XPC/XPH
Page 117



AMC Control
Gigapleat NXPP
Page 118



AMC Control
Gigapleat NXPH
Page 119



AMC Control
Gigapleat NXPC
Page 120

Why Molecular Filtration?

Air pollution caused by traffic, manufacturing, power plants, agriculture and even forest fires is a growing problem in our industrialized world.

Molecular gaseous compounds are invisible and all around us. Some of these compounds are so toxic, and yet so hard for us to detect, that they can do us harm with our even realizing we have been exposed.

Unfortunately we are routinely being subjected to such hazardous compounds in our offices, our homes, our cities and even during our leisure time.

The impact of such exposure can be significant. High ozone or volatile organic compound (VOC) levels represent a serious health threat for all of us. At the same time air pollution can damage everything from valuable artifacts in museums to exposed surfaces in our homes and offices.

In manufacturing environments Airborne Molecular Contamination (AMC) can cause a variety of problems. In semiconductor manufacturing, for example, AMC can reduce product yield, corrode valuable optical components and damage a wide range of process equipment.

In other industries, as products and processes become more complex and more sensitive to all types of contamination, the control of AMC will become an ever more critical part of ensuring product quality and improving process yield rates.

Additional services

Camfil offers a wide range of AMC focused services that allow our customers to remain focused on their core business. These services include filter life time analysis, real time online measurement of contaminants and passive sampling to precisely determine the type and concentration of the problem compounds.

Once local analysis has been completed our AMC experts can propose comprehensive AMC solutions based on the minimum possible Life Cycle Cost available to meet customer needs.

Camfil is the only filter company equipped with a full size filter test facility designed to performance test not just filter media samples but also full size filters under precisely simulated conditions. This full size filter testing is the basis for all our published technical data and can be used to test filter performance against wide and varied range of AMC challenges under precise temperature, humidity and air flow conditions.

This type of performance data can be invaluable when it comes to determining the optimal solution for any specific AMC challenge.



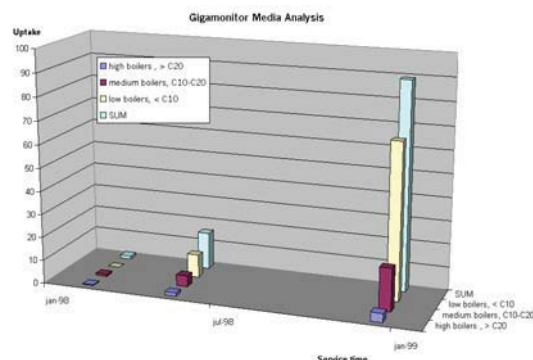
Filter test rig in Camfil Tech Center, Sweden



Gigacheck



Campure Coupon



Example: Rest capacity check of a molecular filter in operation

Ozone rating



Camfil introduce an ozone removal efficiency classification for molecular filters.

Ozone may be removed from air by molecular filters. To help customers assess the effectiveness of different products, Camfil introduce an ozone removal efficiency rating system. This is a first in the filtration industry.

Ozone

Ozone is a naturally occurring gas that is widely present in our environment at ground level. The ozone molecule is composed of three oxygen atoms, rather than the two atoms of normal oxygen. Ozone is formed by the interaction of other gaseous pollutants such as oxides of nitrogen and volatile organic compounds (VOCs) under the influence of ultraviolet (UV) light. City centre levels of ozone increase during periods of high sunlight. Ozone is classed as an oxidising agent, and has the potential to damage or destroy other molecules.

Ozone and human health

Ozone is an extremely reactive gas and inhalation of ozone can be harmful to human health. The presence of ozone in air may be readily correlated to hospital admission rates relating to respiratory illness. Symptoms of ozone exposure include; throat irritation, aggravation of asthma, decrease in lung function and increased susceptibility to respiratory infection. Ambient ozone levels and high alerts may be available on local government websites in many parts of the world.

Removing ozone from the air

Molecular filters reduce ozone levels in the air through processes of adsorption and decomposition.

Measuring ozone removal efficiency

Camfil use a unique test rig to measure ozone removal efficiency. Temperature and relative humidity conditioned air is blown through full size production filters. Ozone is injected into the airstream and sensitive ozone detectors measure the concentration upstream and downstream of the filter. Filter efficiency is readily calculated from the up-and downstream ozone concentrations.

Camfil are market leaders in the validation of performance of molecular filters. Filters can be challenged with many different gases and vapours. Using temperatures between 5 and 50 deg C and relative humidity values between 30% and 90%, we can determine the performance of our filters under the conditions present in our customer applications.



Filter Type	Average Ozone Removal Efficiency	Ozone Rating
City-Flo XL	35%	3
CityPleat 200 2"	50%	5
CityPleat 480 4"	65%	6
CitySorb	70%	7
City-Flo	80%	8
CityCarb	90%	9

(i) All filters tested at 2.5 m/s face velocity (500 fpm);
(ii) Ozone challenge = 150 – 450 ppb;
(iii) Temperature = 22 deg C; iv) Relative humidity = 50%)

All the filters use a high quality broad spectrum adsorbent, based on activated carbon to destroy the ozone molecules. Laboratory tests show that filters based on the use of potassium permanganate, which is itself a strong oxidising agent are unlikely to be as effective.

Our "City" - Products

Sick-Building-Syndrome

Sick-Building-Syndrome is the negative impact on health of human beings caused by harmful substances.

The sources of harmful substances are outside e.g. traffic, power plants, industrial manufacturing, forest fires and bacteria. Inside of buildings e.g. furniture's, coatings, carpets and detergents.

All these chemical, harmful substances together can cause headache, fatigue, allergy and decreasing concentration.

Our 2-in-1 principle

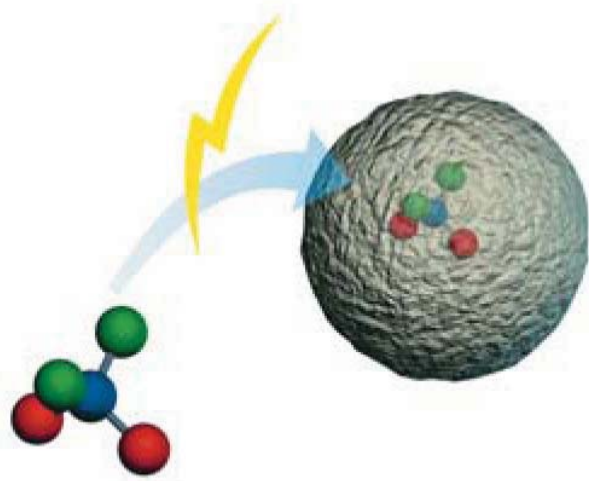
Our CityPleat, CityFlo and CityCarb filter are able to remove particles, bacteria, spores, air pollution and smell. As a result the indoor air quality (IAQ) index is significantly improved.

This improvement is due to:

1. High efficiency particle filtration: filter class F7 / F9 according EN 779.
2. Adsorption of volatile organic compounds (VOC) including smell, sulfur dioxide and ozone: High efficiency through RAD principle.

RAD Principle

RAD stands for Rapid Adsorption Dynamics and is the basis for high efficiency gas filtration. Our filters are able to remove effectively smell and gaseous air pollutants. Ozone for instance is removed with an efficiency higher than 90% thanks to the high efficiency media used in Citycarb. Camfil is using best-in class media to achieve a relative long life time of the filters.



Easy installation

Our filters can be easily installed due to the customer friendly HF frame set. The "City" filters can be normally installed in the existing bag filter frames.

Active against dust, air pollution and smell with only one filter!



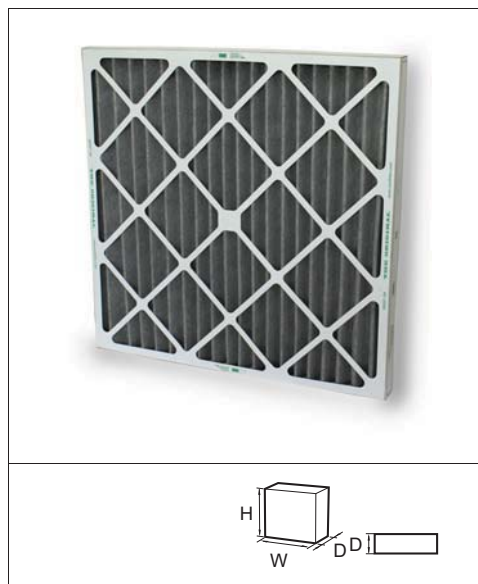
Molecular media selection chart

Target molecule	No. of carbon atoms & performance indicator											Camfil molecular media	Formula	Molecular weight	Boiling point (°C)	Vapour pressure (mmHg @ 20°C)		
	C1	C2	C3	C4	C5	C6	C7	C8	C9	>C9	non C							
Alkanes																		
Methane														CH ₄	16.0	-161.5	33,903	
Ethane														C ₂ H ₆	30.1	-88.6	28,127	
Propane														C ₃ H ₈	44.1	-42.1	6,274	
Butane													LGS	C ₄ H ₁₀	58.1	-0.6	1,557	
Pentane													LGS	C ₅ H ₁₂	72.2	36.1	424.2	
Hexane													LGS	C ₆ H ₁₄	86.2	68.7	123.0	
Heptane													LGS	C ₇ H ₁₆	100.2	98.4	47.3	
Octane													LGS	C ₈ H ₁₈	114.2	125.5	12.1	
Nonane													LGS	C ₉ H ₂₀	128.3	150.6	3.60	
Decane											#		LGS	C ₁₀ H ₂₂	142.3	173.8	20.3	
Dodecane													LGS	C ₁₂ H ₂₆	170.3	216.3	0.98	
Eicosane (n)													LGS	C ₂₀ H ₄₂	282.6	343.0	0.98	
Cyclohexane						#							LGS	C ₆ H ₁₂	84.2	80.7	78.0	
Alkenes																		
Ethylene		#											C8	C4	C ₂ H ₄	28.1	-103.7	26,627
Propylene															C ₃ H ₆	42.1	-47.7	7,628
Butene															C ₄ H ₈	56.1	-6.3	1,910
Pentene													LGS		C ₅ H ₁₀	70.1	30.0	548.8
Hexene													LGS		C ₆ H ₁₂	84.2	63.0	160.1
Heptene													LGS	CEX	C ₇ H ₁₄	98.2	94.0	47.1
Octene													LGS	CEX	C ₈ H ₁₆	112.2	121.0	14.4
Nonene													LGS	CEX	C ₉ H ₁₈	126.2	146.9	3.30
Decene											#		LGS	CEX	C ₁₀ H ₂₀	140.3	170.0	1.28
1,3-Butadiene													LGS		C ₄ H ₆	54.1	-6.6	1,838
1,3-Hexadiene													LGS		C ₆ H ₁₀	82.1	59.0	173
Phene (a)													LGS	CEX	C ₁₂ H ₁₈	136.2	156.2	3.53
Arenes (Aromatics)																		
Benzene													LGS	CEX	C ₆ H ₆	78.1	80.1	75.8
Toluene													LGS	CEX	C ₇ H ₈	92.1	110.6	21.7
Ethylbenzene													LGS	CEX	C ₈ H ₁₀	106.2	136.2	6.98
Styrene													LGS*	CEX*	C ₈ H ₈	104.1	145.0	4.65
Xylene													LGS	CEX	C ₈ H ₁₀	106.2	144.4	6.00
Trimethylbenzene													LGS	CEX	C ₉ H ₁₂	120.2	164.7	1.88
Naphthalene											#		LGS	CEX	C ₁₀ H ₈	128.2	218.0	0.08
Biphenyl													LGS	CEX	C ₁₂ H ₁₀	154.2	255.9	0.00
Alcohols																		
Methanol															CH ₃ OH	32.0	64.7	97.7
Ethanol													LGS		C ₂ H ₅ OH	46.1	78.5	44.3
Isopropanol													LGS		C ₃ H ₇ OH	60.1	82.2	34.6
Butanol													LGS		C ₄ H ₉ OH	74.1	117.0	5.70
Pentanol													LGS	CEX	C ₅ H ₁₁ OH	88.2	138.0	4.50
Hexanol													LGS	CEX	C ₆ H ₁₃ OH	102.2	158.0	0.98
Heptanol													LGS	CEX	C ₇ H ₁₅ OH	116.2	175.8	0.11
Octanol													LGS	CEX	C ₈ H ₁₇ OH	130.2	195.0	0.14
Nonanol													LGS	CEX	C ₉ H ₁₉ OH	144.3	214.0	0.01
Decanol											#		LGS	CEX	C ₁₀ H ₂₁ OH	158.3	232.9	0.01
Ethylene glycol													LGS		C ₂ H ₄ O ₂	62.1	198.0	0.08
Phenol													LGS	CEX	C ₆ H ₅ OH	94.1	101.7	0.16

Target molecule	No. of carbon atoms & performance indicator											Camfil molecular media	Formula	Molecular weight	Boiling point (°C)	Vapour pressure (mmHg @ 20°C)			
	C1	C2	C3	C4	C5	C6	C7	C8	C9	>C9	non C								
Nitriles																			
Acetonitrile												LGS		C ₂ H ₃ N	41.1	81.0	72.7		
Acrylonitrile												LGS*		C ₃ H _{3.5} N	53.1	77.5	93.0		
Organic acids																			
Formic acid	+											CEX A6	CEX A3	LGS	CH ₂ O ₂	46.0	100.5	32.43	
Acetic acid												CEX A6	CEX A3	LGS	CH ₃ COOH	60.1	118.2	11.37	
Propanoic acid				+								CEX A6	CEX A3	LGS	C ₃ H ₇ O ₂	74.1	141.0	9.16	
Butyric acid						+						CEX A6	CEX A3	LGS	C ₄ H ₉ O ₂	88.1	164.0	7.81	
Benzoic acid								+				CEX A6	CEX A3	LGS	C ₇ H ₆ O ₂	122.1	249.8	10.00	
Acid gases																			
Hydrogen fluoride											+	CEX A3	CEX A6	LGS	HF	20.0	19.5	675	
Hydrogen sulfide											+	CEX A1	CEX A3	C15	H ₂ S	34.1	40.3	13,576	
Hydrogen chloride											+	CEX A3	CEX A6	LGS	HCl	36.5	40.0	31,525	
Sulfur dioxide											+	CEX A3	C15	LGS	SO ₂	64.1	-10.0	2,479	
Chlorine											+	CEX A3	C5	LGS	Cl ₂	70.9	-34.1	5,049	
Hydrogen cyanide											+	CEX A6			HCN	27.02	25.6	621	
Nitrogen dioxide											+	CEX A6	LGS		NO ₂	46.0	21.2	720	
Ammonia and Amines																			
Ammonia												+	CEX B1		NH ₃	17.0	-33.4	6,430	
Methylamine	+											+	CEX B1		CH ₃ N	31.1	-6.9	2,280	
Trimethylamine			+									+	CEX B1		C ₃ H ₉ N	59.1	3.0	1,365	
Pyridine					+							+	CEX B1	LGS	CEX	C ₅ H ₅ N	79.1	115.0	15
Trimethylpyridine												+	LGS	CEX	CEX B1	C ₇ H ₉ N	99.1	202.0	1.95
Triethylamine							+					+	CEX B1	LGS	CEX	C ₆ H ₁₅ N	101.2	89.0	53.3
Toluidine												+	LGS	CEX	CEX B1	C ₇ H ₉ N	107.2	203.0	0.30
Nicotine												+	LGS	CEX	CEX B1	C ₁₀ H ₁₁ N	162.2	246.0	0.08
Tributylamine											+	+	CEX B1	LGS	CEX	C ₁₂ H ₂₇ N	185.4	216.5	0.18
Hydrazine											+	+	CEX B1			N ₂ H ₄	32.1	113.5	15.8
Miscellaneous compounds																			
Carbon monoxide												+	CEX B1			CO	28.0	-191.5	-
Carbon dioxide												+	CEX B1			CO ₂	44.0	-78.5	42,971
Acetylene												+	CEX B1			C ₂ H ₂	26.0	-81.5	32,568
Radon												+	CEX B1			Rn	222.0	-61.7	10,230
Dimethyl sulfide				+								+	C8	C4		C ₂ H ₆ S	62.1	37.0	420
Ethyl mercaptan				+								+	CEX A1	CEX A3	C8	C ₂ H ₅ SH	62.1	35.0	439
Hexamethyldisiloxane (HMDSO)												+	LGS	CEX		C ₆ H ₁₈ OSi ₂	162.4	101.0	39.9
Toluene-2, 4-disocyclo-octene (TDO)												+	LGS	CEX		C ₁₀ H ₁₆ O	174.2	251.0	0.010
Di-cyclopentyl phthalate (DCP) or DCP												+	LGS	CEX		C ₂₀ H ₃₀ O ₄	390.6	385.0	18.8
Diisooctyl phthalate (DIOP)												+	LGS	CEX		C ₂₄ H ₄₀ O ₄	418.6	244.0	1.00
Diisododecyl phthalate (DDIP)												+	LGS	CEX		C ₂₈ H ₄₈ O ₄	466.7	250.0	1.11
Mercury vapour											+	+	CEX A4	CEX A3		Hg	200.6	356.7	0.0015
Hydrogen peroxide											+	+	LGS	CEX		H ₂ O ₂	34.0	150.2	5.70
Ozone											+	+	LGS	CEX		O ₃	48.0	-111.9	0

Target molecule	No. of carbon atoms & performance indicator											Camfil molecular media	Formula	Molecular weight	Boiling point (°C)	Vapour pressure (mmHg @ 20°C)	
	C1	C2	C3	C4	C5	C6	C7	C8	C9	>C9	non C						
Esters																	
Methyl acetate												LGS		C ₄ H ₈ O ₂	74.1	57.1	186.2
Ethyl acetate												LGS		C ₄ H ₈ O ₂	88.1	77.0	72.6
Vinyl acetate												LGS		C ₄ H ₆ O ₂	86.1	72.7	93.3
Methyl acrylate												LGS		C ₅ H ₈ O ₂	86.0	80.0	66.9
Allyl acetate												LGS	CEX	C ₅ H ₈ O ₂	100.1	103.0	30.8
Methyl methacrylate												LGS	CEX	C ₆ H ₁₀ O ₂	100.1	100.0	22.0
Ethyl acrylate												LGS	CEX	C ₆ H ₁₀ O ₂	100.1	99.0	32.6
Propyl acetate												LGS	CEX	C ₇ H ₁₂ O ₂	102.1	102.0	28.4
Ethyl butate												LGS	CEX	C ₈ H ₁₆ O ₂	118.1	154.0	1.65
Ethyl methacrylate												LGS	CEX	C ₈ H ₁₆ O ₂	114.1	118.5	25.4
Isopropyl acrylate												LGS	CEX	C ₈ H ₁₆ O ₂	114.1	110.0	20.4
Butyl acetate												LGS	CEX	C ₈ H ₁₆ O ₂	116.2	127.0	8.03
Propylene glycol methyl ether acetate												LGS	CEX	C ₈ H ₁₆ O ₃	132.2	146.0	3.68
Butyl acrylate												LGS	CEX	C ₉ H ₁₈ O ₂	128.2	145.0	4.43
Pentyl acetate												LGS	CEX	C ₉ H ₁₈ O ₂	130.2	149.0	7.30
Ethylene acrylate												LGS	CEX	C ₈ H ₁₆ O ₂	170.2	67.0	-
Ethers																	
Ethylene oxide												LGS		C ₂ H ₄ O	44.1	11.0	1,088
Propylene oxide												LGS		C ₃ H ₆ O	58.1	34.3	443
Diethyl ether												LGS		C ₄ H ₁₀ O	74.1	34.6	464.0
Dimethoxyethane												LGS		C ₄ H ₁₀ O ₂	90.1	85.0	55.7
Dioxane												LGS		C ₆ H ₁₀ O	88.1	101.1	28.2
Anisole												LGS		C ₇ H ₈ O	108.1	154.0	1.63
Tetrahydrofuran												LGS		C ₄ H ₈ O	72.1	67.0	190
Diphenyl ether												LGS	CEX	C ₁₂ H ₁₀ O	170.2	257.9	0
Aldehydes																	
Formaldehyde	+											C8	CEX J2	CH ₂ O	30.0	-19.3	3,315
Acetaldehyde		+										C8	CEX J2	CH ₃ CHO	44.1	20.2	833
Acrolein												LGS		C ₃ H ₂ CHO	56.1	52.5	248.3
Propanal												LGS		C ₃ H ₆ O	58.1	48.8	255
Butanal												LGS		C ₄ H ₈ O	72.1	75.7	90
Pentanal												LGS		C ₅ H ₁₀ O	86.1	103.0	30
Hexanal												LGS		C ₆ H ₁₂ O	100.2	128.0	7.5
Benzaldehyde												LGS	CEX	C ₇ H ₆ O	106.1	179.0	0.98
Heptanal												LGS	CEX	C ₈ H ₁₆ O	114.2	153.0	2.63
Nonanal												LGS	CEX	C ₁₀ H ₁₈ O	142.3	93.0	0.92
Ketones																	
Acetone												LGS*		C ₃ H ₆ O	58.1	56.0	209.3
Methyl ethyl ketone												LGS*		C ₅ H ₁₀ O	72.1	78.2	79.5
Cyclohexanone												LGS*	CEX*	C ₆ H ₁₀ O	98.1	156.0	2.99
Alkyl halides (Halogenated)																	
Dichloromethane												LGS		CH ₂ Cl ₂	84.9	40.7	352.5
Chloroform												LGS		CHCl ₃	119.4	61.7	159.8
Carbon tetrachloride												LGS		CCl ₄	153.8	76.7	89.6
Vinyl chloride														CH ₂ CHCl	62.5	-13.4	2,555
Ethyl chloride												LGS		C ₂ H ₅ Cl	64.5	12.0	1,013
Trichloroethylene												LGS		C ₂ HCl ₃	131.4	87.0	58.0
Tetrachloroethylene												LGS		C ₂ Cl ₄	165.8	121.4	14.2

CityPleat



Advantages

- Compact "2 in 1" solution
- Double action: particle and odour filtration
- Ideal for filtering most low concentration interior and exterior pollutants
- 100% incinerable
- Can be used to upgrade existing installations
- Range of standard sizes

Application: High efficiency particle filtration for deodorisation and removal of gas pollutants, used for filtration in offices, airports.

Type: Prefilter for gas and particles removal.

Frame: Moisture resistant cardboard.

Media: Synthetic fibre and broad spectrum carbon.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

Recommended temperature: 0 - 40°C.

Recommended relative humidity: 30 - 70%.

Recommended final pressure drop: 250 Pa.

Maximum final pressure drop: 350 Pa.

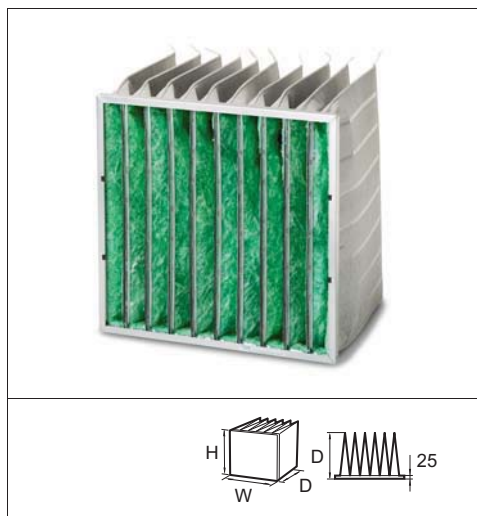
Ozone removal efficiency: 50 - 70% depending on model and air flow.

All values are +15%.

Model	Width	Height	Depth	Filter Class	Air flow m ³ /h	Pressure drop	Volume m ³	Weight kg
CityPleat-100-594x594x44	594	594	44	G4	1900	135	0,019	1
CityPleat-100-289x594x44	289	594	44	G4	900	135	0,01	0,5
CityPleat-200-594x594x44	594	594	44	G4	3175	135	0,019	1,8
CityPleat-200-289x594x44	289	594	44	G4	1500	135	0.10	0,9
CityPleat-200-594x594x95	594	594	95	G4	3185	110	0.039	2
CityPleat-200-289x594x95	289	594	95	G4	1500	110	0.019	1
CityPleat-480-594x594x95	594	594	95	G4	3185	90	0.039	3,8
CityPleat-480-289x594x95	289	594	95	G4	1500	90	0.019	1,9

*Full size test in Camfil molecular filtration test rig.

City-Flo



Advantages

- Double action: particle and molecular filtration
- Range of standard sizes
- Can be used to upgrade existing installations
- Ideal for filtering most low concentration interior and exterior pollutants
- Robust metal header frame

Application: Particle and odour removal in Hospitals, Offices, Airports etc.

Type: Multi pocket particle and molecular filter.

Frame: Galvanised steel.

Media: Glass fibre and broad spectrum carbon.

EN779:2012 efficiency: F7.

Temperature: 50°C maximum in continuous service.

Humidity: 70% RH maximum.

Holding frames: Front and side access holding frames are available: Type 8, Type L and FC Housings.



Width	Height	Depth	Filter class	Air flow m ³ /h	Pressuredrop	Bags	area m ²	Volume m ³	Weight kg	Initial eff. %	ME %	Energy class	Energy consumption kWh/y
592	592	534	F7	3400	140	10	6,2	0,2	6	62	55	D	1823
490	592	534	F7	2700	140	8	5	0,2	4,6			D	
287	592	534	F7	1700	140	5	3,1	0,1	3,5			D	

* ME%: Minimum efficiency ref. to EN779:2012

* Energy Consumption, kWh/year: Calculated according to Eurovent Guideline 4/11

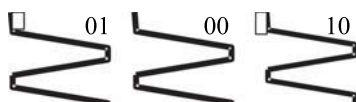
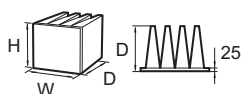
* Energy class: Calculated according to Eurovent 4/11

Industry leading bag filter construction is available with an additional molecular filtration media layer to provide gas filtration and enhanced IAQ.

City-Flo is the ultimate solution when a high performance bag filter and a high performance molecular (gas, odour) filter must be installed in a single location. City-Flo filter can easily be fitted into new or existing standard filter frames. High performance Camfil glass fibre media is combined with an exclusive "Broad Spectrum" carbon media that exploits the benefits of "Rapid Adsorption Dynamics" (RAD) to remove a very wide range of VOCs and odours. Molecular pollutants are released from both external sources (traffic fumes, power generation, industry) and internal sources (building construction and finish materials, wooden materials, carpets, cleaning agents etc.).

The filter should be replaced when the pressure loss exceeds the maximum allowable value for the ventilation system or after a maximum of one year. In accordance with good practice, used City-Flo filters should be bagged immediately after removal and disposed of by the appropriate route.

CityCarb®



Advantages

- Double function: particle and molecular filtration
- Ideal for filtering low concentrations of most external and internal source pollutants
- 100% incinerable
- Can be used to upgrade existing installations
- Range of standard sizes
- Compact “2 in 1” solution

Application: Particle and odour removal in Offices, Hospitals, Airports etc.

Type: Compact particle and molecular filter.

Frame: Polystyrene.

Media: Synthetic fibre and broad spectrum carbon.

ASHRAE 52.2:2007 filter class: MERV 13.

Maximum flow rate: 4000m³/h.

Mounting system: Front and side access holding frames are available: Type 8, Type L and FC housings.

Width	Height	Depth	Filter class	Air flow m ³ /h	Pressure drop	Bags	area m ²	Volume m ³	Weight kg	Initial eff. %	ME %	Energy class	Energy consumption kWh/y
592	592	292	MERV 13	3400	120		8	0,1	11,8			G	>1550
592	490	292	MERV 13	2800	120		6,6	0,1	8,5			G	
592	287	292	MERV 13	1500	120		3,5	0,05	6			G	

* ME%: Minimum efficiency ref. to EN779:2012

* Energy Consumption, kWh/year: Calculated according to Eurovent Guideline 4/11

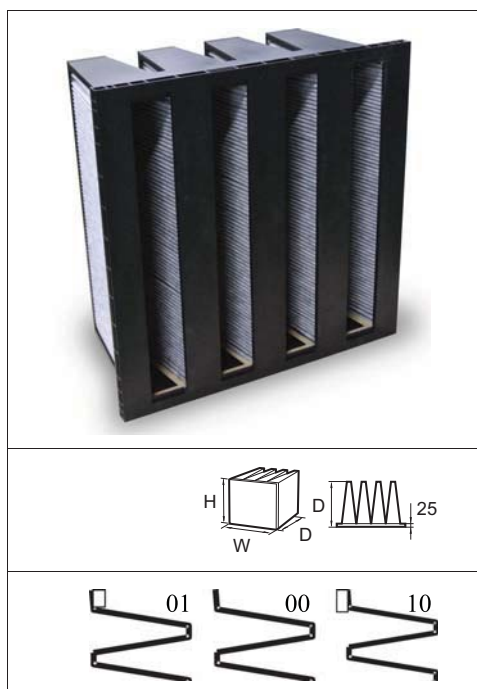
* Energy class: Calculated according to Eurovent 4/11

A compact filter with an additional molecular filtration media layer to provide enhanced IAQ through combined particle filtration and gas filtration.

CityCarb is the ultimate solution when a high performance compact filter and a high performance molecular (gas, odour) filter must be installed in a single location. CityCarb filter can easily be fitted into new or existing standard filter frames. Particle filtration media is combined with an exclusive “Broad Spectrum” carbon media that exploits the benefits of “Rapid Adsorption Dynamics” (RAD) to remove a very wide range of VOCs and odours. Molecular pollutants are released from both external sources (traffic fumes, power generation, industry) and internal sources (building construction and finish materials, wooden materials, carpets, cleaning agents etc).

The filter should be replaced when the pressure loss exceeds the maximum allowable value for the ventilation system or after a maximum of one year. In accordance with good practice, used CityCarb filters should be bagged immediately after removal and disposed of by the appropriate route.

CitySorb



Advantages

- Ideal for filtering low concentrations of most molecular pollutants from external and internal sources.
- 100% incinerable
- Range of standard sizes
- High efficiency
- Large air flow capacity
- Compact filtration solution

Application: Adsorption of odours and gasses in air conditioning applications.

Type: Rigid pleated filter.

Case: Polystyrene.

Media: Multilayer carbon media.

Sealant: Polyurethane.

Gasket: One piece PU gasket.

Recommended temperature range: 0-40°C.

Recommended relative humidity: < 70% RH.

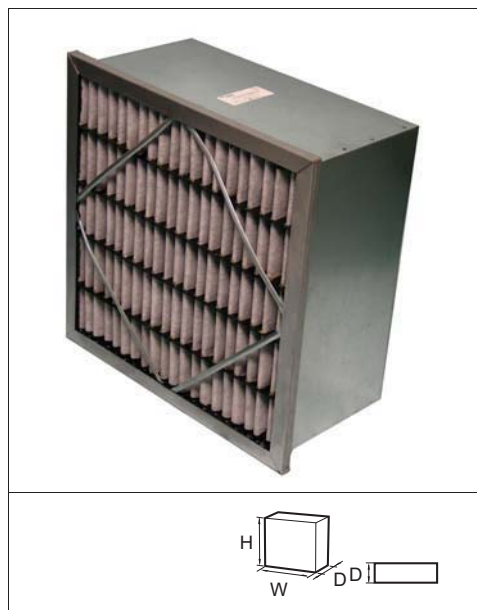
Holding frames: Front and side access housings and frames are available, Type 8, Type L and FC Housings.

Width	Height	Depth	Air flow m ³ /h	Pressure drop	Area m ²	Volume m ³	Weight kg
592	592	292	3400	80	8.0	0.1	10.8
592	490	292	2800	80	6.6	0.1	9.2
592	287	292	1500	80	3.5	0.05	5.4

A compact molecular filter to provide enhanced IAQ in buildings. CitySorb is the ultimate solution when a high performance molecular filter must be installed in the ventilation system and there is existing pre-filtration. CitySorb filter can easily be fitted into new or existing standard filter frames. "Broad Spectrum" carbon media that exploits the benefits of "Rapid Adsorption Dynamics" (RAD) is used to remove a very wide range of VOCs and odours. Molecular pollutants are released from both external sources (traffic fumes, power generation, industry etc.) and internal sources (building construction and finish materials, wooden materials, carpets, cleaning agents etc).

The filter should be replaced when the pressure loss exceeds the maximum allowable value for the ventilation system or after a maximum of one year. In accordance with good practice, used CitySorb filters should be bagged immediately after removal and disposed of by the appropriate route.

Riga-Carb



Advantages

- Standard design for removal of acids, alkalines, organic smells and condensable organics.
- Compact solution with low pressure drop
- Available as single or double header

Application: Adsorption of gases for industrial application such as harddisk facilities.

Type: Disposable carbon filter.

Frame: Galvanised steel (other on request). BH: Double Header, PH: Single Header.

Media: Type 202: nonwoven fiber material with impregnated carbon for removal of acids. Type 204: nonwoven fiber material with impregnated carbon for removal of alkalines.

Recommended temperature: 0 - 40°C.

Recommended relative humidity: 30 - 70%.

Model	WxHxD mm	Media area m²	Air flow / pressure drop m³/h/Pa	Unit weight kg	Unit volume m³
Riga-Carb CSRC-202-242412-BH	592 x 592 x 292	6	3400/75	15	0.1
Riga-Carb CSRC-202-241212-BH	287 x 592 x 292	3.2	1700/75	8	0.05
Riga-Carb CSRC-202-242412-PH	592 x 592 x 292	6	3400/75	15	0.1
Riga-Carb CSRC-202-241212-PH	287 x 592 x 292	3.2	1700/75	8	0.05
Riga-Carb CSRC-204-242412-BH	592 x 592 x 292	6	3400/75	15	0.1
Riga-Carb CSRC-204-241212-BH	287 x 592 x 292	3.2	1700/75	8	0.05
Riga-Carb CSRC-204-242412-PH	592 x 592 x 292	6	3400/75	15	0.1
Riga-Carb CSRC-204-241212-PH	287 x 592 x 292	3.2	1700/75	8	0.05

BH: Double Header; PH: Single Header

Activated Carbon and Campure Media

Effective molecular filtration media

A comprehensive range of molecular filtration medias for the control of corrosive gases, toxic gases, odours and other gaseous pollutants. The medias may be used as part of original equipment packages or as replacement for spent media.

The campure media range comprises chemically impregnated adsorbents based on activated alumina which may be used on their own or blended with activated carbon.



such as hydrogen sulphide, sulphur dioxide, chlorine and oxides of nitrogen may cause serious damage to key electrical equipment essential to process management. Other applications include the control of acidic and odorous gases in waste water treatment applications and the protection of sensitive artefacts in museums and art galleries.



Demanding applications

Campure medias are designed for the most difficult and demanding applications in industrial and commercial environments. The principal areas of use include the control of acidic gases in pulp and paper, oil refining, and steel production industries. If left untreated, acidic gases

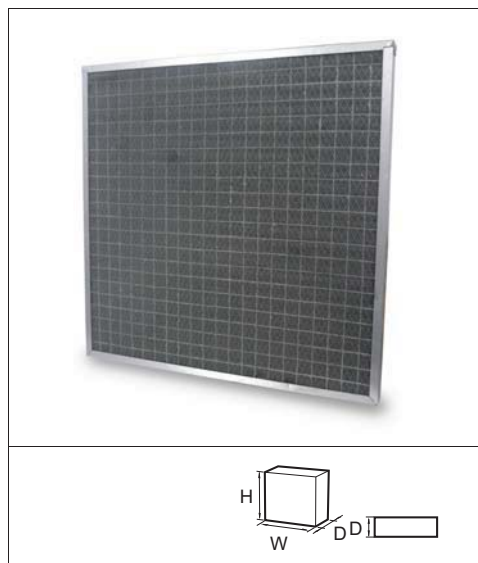
Flexible filtration solutions and support services

Activated carbon and campure medias may be deployed in a range of Camfil hardware systems. These allow standard and custom, solutions for all industrial and commercial applications using various media amounts and bed depths. Activated carbon and campure medias may be re-filled directly into other manufacturers hardware.

These medias are supported by a comprehensive range of technical support services including: media life analysis, corrosion monitoring coupons, on-line monitoring and media handling.

Media	Target gases	Media type
CEX003 CEX004	VOCs, hydrocarbons, general odours	Extruded activated carbon, 3 and 4mm diameter (coal based)
LGS036 LGS048	Light VOCs, hydrocarbons, general odours	Granular activated carbon (coconut shell based)
Impregnated Carbon	Acids, Alkalines, etc.	A wide range of impregnation is available.
Campure 4	H ₂ S, SO ₂ , NOX, formaldehyde, ethylene, light VOCs, Blow mol. Wt. aldehydes and organic acids	H ₂ S, SO ₂ , NOX, formaldehyde, ethylene, light VOCs, low mol. Wt. aldehydes and organic acids
Campure 5	Halogens, halogen acids and organic halides	Activated alumina with chemical impregnation
Campure 8	Enhanced removal of H ₂ S, SO ₂ , NOX, formaldehyde, ethylene, acid gases	Activated alumina with chemical impregnation
Campure 15	H ₂ S, SO ₂ , mercaptans, acid gases, chlorine	Activated alumina and activated carbon with chemical impregnation
Blends	Any of the Campure medias may be blended with either of the activated carbon based medias to provide an adsorption system that combines broad spectrum and highly specific characteristics. The usual blend ratio is 50/50 by volume.	
See individual data sheets for grade specifications		

CamSure



Advantages

- Range of standard and non standard sizes
- High performance
- Suitable for a wide range of air volumes

Application: Adsorption of odours and gases in air conditioning applications.

Type: Loose fill adsorbent panels.

Frame: Galvanised steel.

Media: Campure or activated carbon based materials.

Temperature: 40°C maximum in continuous service.

Recommended relative humidity: 30 - 70%.

Mounting systems: Front and side access housings and frames are available.

Model	Dimensions (WxHxD) mm	Air flow / pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
RS80D-LGS048	594 x 594 x 47	850/70	7.5	0.017
RS80D-LGS048	594 x 289 x 47	425/70	4	0.0083
CamSure-LGS048	600 x 600 x 24	680/125	9.0	0.0086
CamSure-LGS048	300 x 600 x 24	340/125	4.5	0.0043

Above are sample sizes, filters are available in a comprehensive range of sizes, please specify.

Also available with stainless steel case.

Efficient gas filtration with CamCarb

Advanced, high capacity media is used in the CamCarb cylinders to remove smell, corrosive and toxic gases as well as organics in make-up and exhaust air applications.

CamCarb design

Camfil offers a wide range of high efficient media tailored to the customer requirements. Camfil experts select the right CamCarb model and the best suitable media based on lowest cost-of-ownership to fulfill customer requirements. .

Non impregnated activated carbon is typically used to remove volatile organic compounds (VOC) including smell whereas typically impregnated activated carbon is used to remove acidic, caustic and corrosive gases.

Multiple gas filtration with one, two or three filter stages in series can be achieved in applications with unknown gas mix or when for instance VOC's acids and bases are present in the same air stream. Media blends are also available

A special designed holding plate system is used as installation frame for the CamCarb cylinders (CamCarb and CamCarb green). The system is available in three different standard sizes.

It is recommended to use a F7 pre-filter to protect the CamCarb system against particle contamination. Particles in the air block the micro pores of the high efficient activated carbon resulting in rapid performance decrease.

Enforcement of the holding plates is required in big scale CamCarb installations (e.g. make-up air unit). Camfil offers the right stabilization solution with the RZA/MZA modular frame set.

CamCarb refill service for better operational cost and to protect the environment

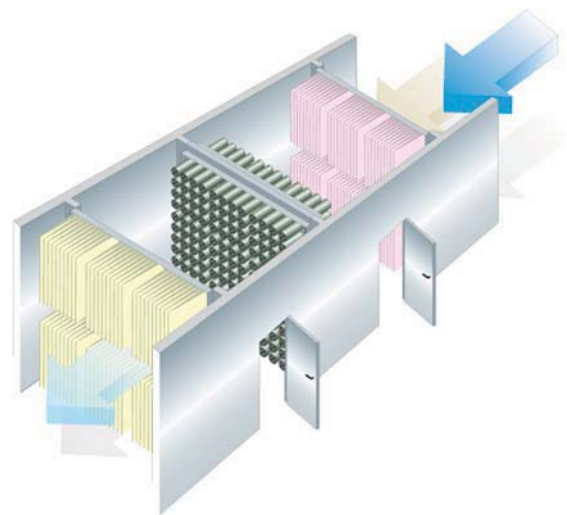
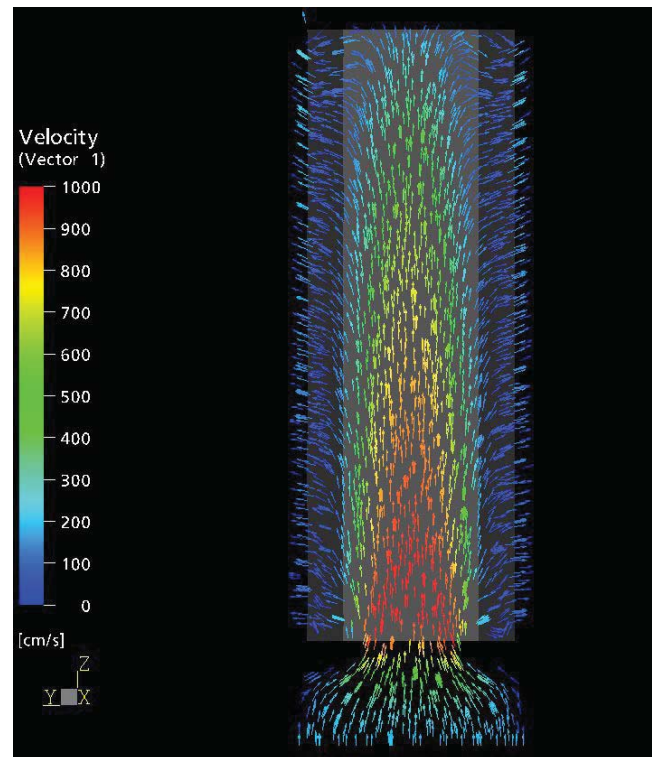
The CamCarb cylinders can be emptied and refilled with new media. This service offers lower operational cost compared to the replacement of the whole cylinder.

Camfil guarantees the same performance of the CamCarb cylinder after the refill service due to special filling technology as well as in-house QA.

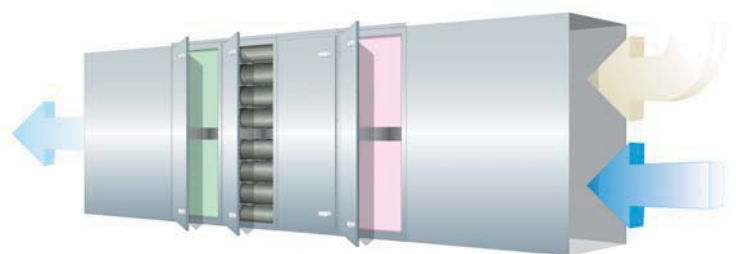
A spare set of cylinders is required to maintain the system operation during the filling process

CamCarb air flow distribution

Camfil did CFD (Computer Fluid Dynamics) simulations to design the Camcarb cylinder to achieve a uniform air flow distribution through the media resulting in longer life time compared to competitor products.



Example of RZA/MZA modular frame set system



Application in make-up air unit

CamCarb Green



Advantages

- Leak-free installation ensures maximum possible efficiency
- 360 degree geometry and even air distribution ensures maximum possible lifetime
- High level of product cleanliness
- Rapid bayonet fitting system and integral dual TPE gaskets
- Totally corrosion resistant
- Reduced weight compared to Metal version
- Modular and flexible assembly
- May be filled with a wide range of molecular filtration medias

Application: The most reliable molecular filter for high efficiency and long-term control of molecular contaminants in sensitive buildings and process industries.

Type: Cylindrical molecular filter cartridge manufactured from engineering grade resins.

Filtration media: Broad Spectrum activated carbon for control of odours

Cleanliness: Internal scrim protection.

Temperature: 40°C maximum in continuous service.

Mounting system: Dedicated base plate in 3 standard sizes (see separate page).

Model	Diameter mm	Length mm	Carbon Type	Rated Airflow m ³ /hr *	Pressure loss Pa **	Unit Weight kg	Unit volume-unpacked m ³
CCG-R 1300	148	240	CEX003	1250	65	1.55	0.005
CCG-R 2600	148	452	CEX003	2500	100	2.85	0.01
CCG-R 3500	148	595	CEX003	3400	150	3.75	0.013

* Per set of 16 cylinders on a 610 x 610 baseplate

** At rated flow. Pressure drop may vary depending on direction of installation and space in the air handling unit.

CamCarb Green filters are filled with high quality activated carbon or CamPure media and are used for high efficiency removal of molecular contaminants from supply air, recirculation air and exhaust air ventilation systems in sensitive building and process applications.

CamCarb Green filters eliminate customer problems with different categories of airborne molecules, including; odours, irritants, toxic gases and corrosives (acidic gases).

The molecular filtration media is deployed in an annular pattern with uninterrupted 360 degree geometry along the entire length of the filter. This arrangement ensures even air distribution over the entire filter area and maximizes filter lifetime.

Filters mount onto a dedicated baseplate using integrated bayonet fastenings without the need for specialized tools. Three standard sizes of the modular baseplate allow the filter installation to be accommodated in any size air handling unit, duct or plenum.

CamCarb Metal



Advantages

- Leak-free installation ensures maximum possible efficiency
- 360 degree geometry and even air distribution ensures maximum possible lifetime
- May be re-filled, lowest possible Life Cycle Cost (LCC)
- Rapid bayonet fitting system and integral dual TPE gaskets
- Stainless steel construction
- Modular and flexible assembly

Application: The most reliable molecular filter for high efficiency and long-term control of molecular contaminants in sensitive buildings and process industries.

Type: Cylindrical molecular filter cartridge manufactured from stainless steel.

Filtration media: Broad Spectrum activated carbon for control of odours

Temperature: 40°C maximum in continuous service.

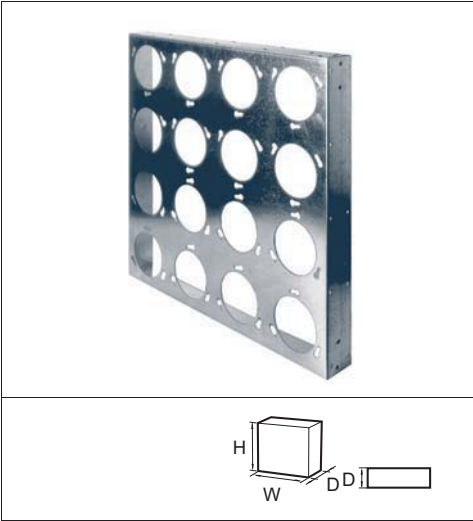
Mounting system: Dedicated base plate in 3 standard sizes (see separate page).

Model	Diameter mm	Length mm	Carbon Type	Rated Airflow m ³ /hr *	Pressure loss Pa **	Unit Weight kg	Unit volume-unpacked m ³
CC 2600	147	450	CEX003 ***	2500	100	3.9	0.01
CC 3500	147	600	CEX003	3400	150	5.2	0.14

* Per set of 16 cylinders on a 610 x 610 baseplate.

** At rated flow. Pressure drop may vary depending on direction of installation and space in the air handling unit.

CamCarb Mounting Frames (Baseplates)



Advantages

- Modular design adaptable for all types of installations
- Rapid fitting system via bayonet fitting
- Quick and easy service
- Three standard sizes
- Assembly by bolting, rivets, welding

Application: Dedicated mounting frames to ensure leak-free installation of CamCarb molecular filters in AHUs, ducts and plenums.

Applicable filters: CamCarb Metal and CamCarb Green in 2600 and 3500 sizes. (Note always specific filter type when ordering as base plate thickness may vary to accommodate different weights of filters).

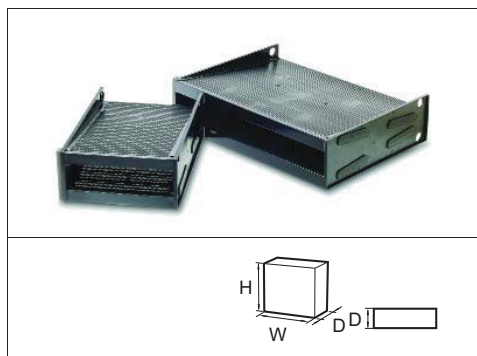
Material: Galvanised steel or stainless steel (specify with order)

Model	Width mm	Height mm	Depth mm	Cylinder capacity	Indicative weight kg	Approx. Unit volume m ³
G8	305	610	70	8	5.0	0.02
G12	457	610	70	12	5.7	0.03
G16	610	610	70	16	6	0.04



As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

CamPure® GDM Green Disposable Modules



Advantages

- Completely incinerable
- Low pressure drop
- Various medias available dependent upon the contaminant(s) of concern
- Retrofit of existing installations

Description: Disposable plastic adsorber module designed to remove corrosive gases from industrial or commercial environments.

Typical application: Existing side-access housings or built up bank assemblies.

Efficiency: Media selection dependent, consult factory.

Adsorbent: "Broad Spectrum" activated carbon, adsorption of odours, ozone and organic gases. Impregnated activated carbon or campure impregnated alumina for adsorption of both organic and inorganic gases.

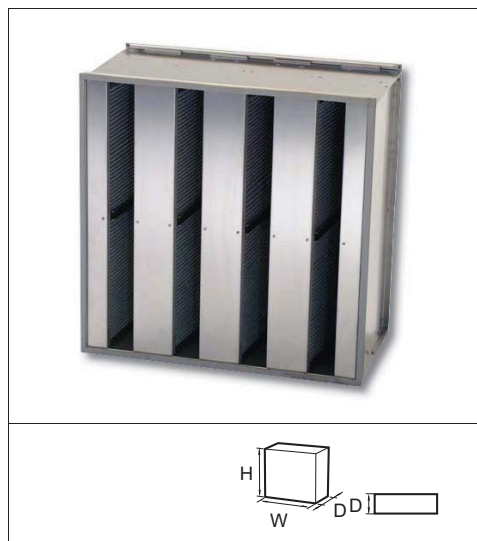
Temperature: Maximum continuous operating temperature of 50°C.

Recommended relative humidity: 30 - 90%.

Model	Dimensions (WxHxD) mm	Air flow / pressure drop m ³ /h/Pa	Media volume	Application
GDM 300F	600x295x300	425/75	27L	Make up air-handling units (MUA), recirculation air handling units, exhaust.
GDM 300H	300x295x300	212/75	13.5L	Make up air-handling units (MUA), recirculation air handling units, exhaust.
GDM 440F	600x145x440	700/50	13.5L	Make up air-handling units (MUA), recirculation air handling units, exhaust.
GDM 440H	300x145x440	350/50	6.75L	Make up air-handling units (MUA), recirculation air handling units, exhaust.

*Housings are available on request.

Gigapleat XPC/XPB



Advantages

- Reduced waste through re-usable housing
- Exchangeable panels
- Up to 2 media types can be combined into the same filter
- Compact solution
- High media cleanliness

Application: Clean room recirculation air and clean room make up air.

Type: Compact filter with exchangeable panels.

Housing: Stainless steel. Removable sheet metal profiles for panel replacement.

Gasket: Position: 01 - downstream, 10 - upstream.

Sealant: Polyurethane.

Configuration XPC: 2 layers of 8 panels / full size housing.

Configuration XPH: 1 layer of 8 panels / full size housing.

Recommended temperature range: 10 - 40°C.

Recommended relative humidity: 30 - 70%.

Particle cleanliness: ISO Class 6.

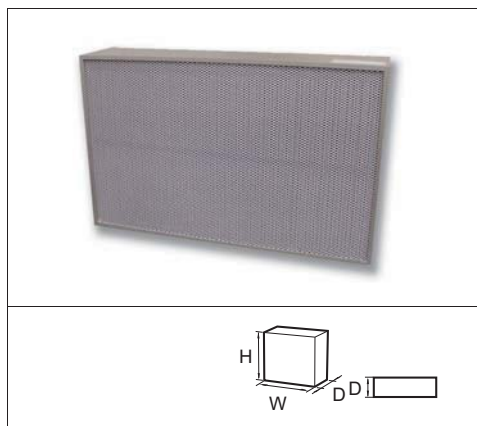
Outgassing: Individually outgassing tested for VOC emissions on request

Product	Type	Material	Width	Height	Depth	Number of panels per layer	Number of panels per housing	Appr. Weight with panels kg	Volume m ³
Box Housing	XPC 610x610x292	Stainless Steel	610	610	292	8	16	28	0,13
Box Housing	XPC 305x610x292	Stainless Steel	305	610	292	4	8	16	0,06
Header Housing	XPH 592x592x292	Stainless Steel	592	592	292	8	8	17	0,13
Header Housing	XPH 287x592x292	Stainless Steel	287	592	292	4	4	9	0,06

Panel	Fit Housing Width	Fit Housing Height	Fit Housing Depth	Air flow m ³ /h	Pressure drop Pa +15%
XPC A3	610/305	610	292	2600/1100	95
XPC B2	610/305	610	292	2600/1100	95
XPC C3	610/305	610	292	2600/1100	95
XPC L3	610/305	610	292	2600/1100	95
XPH A3	592/287	592	292	2600/1100	60
XPH B2	592/287	592	292	2600/1100	60
XPH C3	592/287	592	292	2600/1100	60
XPH L3	592/287	592	292	2600/1100	60

AMC removal vs filter model	L3	B2	A3	C3
Acids				YES
Bases		YES	YES	
Condensables (B.Pt > 150 deg. C)	YES		Yes	Yes
Dopants (Organophosphates)	YES		Yes	Yes
Dopants (BF ₃)				YES
Organics (B.Pt < 150 deg. C)	YES			
Ozone	YES		Yes	Yes
For specific contaminants, please contact Camfil				

Gigapleat NXPP



Advantages

- Extremely low pressure drop
- High media cleanliness
- Individually VOC outgassing tested
- Extremely small form factor
- Wide range of dimensions
- Multiple media types can be combined into the same filter

Application: For clean room ceiling, Fan Filter Units, mini-environment or process equipment.

Type: Panel filter.

Frame: Anodized aluminium.

Available filter depth without knife edge: 66, 90, 110, 150, 172 and 200 mm.

Available filter depth with knife edge: 66 (+38), 90 (+38), 110 (+38), 150 (+15) mm.

Knife: KU facing up, KD facing down.

Sealant: Polyurethane.

Gasket: 01=Downstream gasket, 10=Upstream, 11=2 gaskets.

Faceguard: 02: Downstream faceguard; 20: Upstream faceguard, 22: 2 faceguards.

Recommended temperature range: 10 - 40°C.

Recommended relative humidity: 30 - 70%.

Particle cleanliness: ISO Class 6.

Outgassing: Individually outgassing tested for VOC emissions.

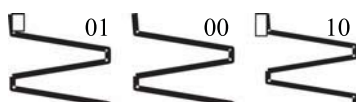
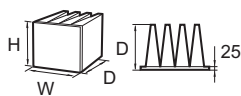
Type	Width	Height	Depth	Air flow m ³ /h	Pressure drop Pa +/-15%	Appr. Weight kg	Volume m ³
NXPP A3	610	610	90	535	15	5	0,04
NXPP A3	1220	610	90	1070	15	10	0,04
NXPP B2	610	610	90	535	15	5	0,04
NXPP B2	1220	610	90	1070	15	10	0,04
NXPP C3	610	610	90	535	15	5	0,04
NXPP C3	1220	610	90	1070	15	10	0,04
NXPP L3	610	610	90	535	15	5	0,04
NXPP L3	1220	610	90	1070	15	10	0,04
NXPP B2C3L3	610	610	150	535	50	14	0,06
NXPP B2C3L3	1220	610	150	1070	50	28	0,06

Other dimensions and media combinations available on request. Adapter frames for FFU installation available on request.

AMC removal vs filter model	L3	B2	A3	C3
Acids				YES
Bases		YES	YES	
Condensables (B.Pt > 150 deg. C)	YES		Yes	Yes
Dopants (Organophosphates)	YES		Yes	Yes
Dopants (BF3)				YES
Organics (B.Pt < 150 deg. C)	YES			
Ozone	YES		Yes	Yes

For specific contaminants, please contact Camfil

Gigapleat NXPB



Advantages

- Low pressure drop
- Low weight
- High media cleanliness
- Incinerable

Application: Clean room recirculation air, clean room make up air.

Type: Compact filter with header.

Frame: ABS.

Sealant: Polyurethane.

Gasket: 01= downstream, 10 = upstream.

Recommended temperature range: 10 - 40°C.

Recommended relative humidity: 30 - 70%.

Particle cleanliness: ISO Class 6.

Outgassing: Individually outgassing tested for VOC emissions on request.

Type	Width	Height	Depth	Air flow m ³ /h	Pressure drop Pa +-15%	Appr. Weight kg	Volume m ³
NXPB A3	592	592	292	3300	60	12	0,13
NXPB A3	592	287	292	1600	60	6,5	0,06
NXPB B2	592	592	292	3300	50	12	0,13
NXPB B2	592	287	292	1600	50	6,5	0,06
NXPB C3	592	592	292	3300	60	12	0,13
NXPB C3	592	287	292	1600	60	6,5	0,06
NXPB L4	592	592	292	3300	60	12	0,13
NXPB L4	592	287	292	1600	60	6,5	0,06

AMC removal vs filter model	L3	B2	A3	C3
Acids				YES
Bases		YES	YES	
Condensables (B.Pt > 150 deg. C)	YES		Yes	Yes
Dopants (Organophosphates)	YES		Yes	Yes
Dopants (BF ₃)				YES
Organics (B.Pt < 150 deg. C)	YES			
Ozone	YES		Yes	Yes
For specific contaminants, please contact Camfil				

Gigapleat NXPC



MOLECULAR

Advantages

- Low pressure drop
- High media cleanliness
- Wide range of dimensions

Application: Clean room recirculation air, clean room make up air.

Type: Compact filter.

Frame: GI, aluminium or stainless steel.

Sealant: Polyurethane.

Gasket: 01 = downstream, 10 = upstream.

Recommended temperature range: 10 - 40°C.

Recommended relative humidity: 30 - 70%.

Particle cleanliness: ISO Class 6.

Outgassing: Individually outgassing tested for VOC emissions on request

Type	Width	Height	Depth	Air flow m ³ /h	Pressure drop Pa +15%	Appr. Weight kg	Volume m ³
NXPC A3	610	610	292	2600	60	15	0,13
NXPC A3	305	610	292	1100	60	8	0,06
NXPC A3	595	595	292	2600	60	15	0,13
NXPC A3	289	595	292	1100	60	8	0,06
NXPC A3	592	592	292	2600	60	15	0,13
NXPC A3	287	592	292	1100	60	8	0,06
NXPC B2	610	610	292	2600	60	15	0,13
NXPC B2	305	610	292	1100	60	8	0,06
NXPC B2	595	595	292	2600	60	15	0,13
NXPC B2	289	595	292	1100	60	8	0,06
NXPC B2	592	592	292	2600	60	15	0,13
NXPC B2	287	592	292	1100	60	8	0,06
NXPC C3	610	610	292	2600	60	15	0,13
NXPC C3	305	610	292	1100	60	8	0,06
NXPC C3	595	595	292	2600	60	15	0,13
NXPC C3	289	595	292	1100	60	8	0,06
NXPC C3	592	592	292	2600	60	15	0,13
NXPC C3	287	592	292	1100	60	8	0,06
NXPC L3	610	610	292	2600	60	15	0,13
NXPC L3	305	610	292	1100	60	8	0,06
NXPC L3	595	595	292	2600	60	15	0,13
NXPC L3	289	595	292	1100	60	8	0,06
NXPC L3	592	592	292	2600	60	15	0,13
NXPC L3	287	592	292	1100	60	8	0,06

For media choice, please refer to Gigapleat NXPH

Summary Frames, Housings and Speciality Filters



**Housings & Frames -
Terminal Filter Housings**
PHAP® Pharmaseal AP
Page 124



**Housings & Frames -
Terminal Filter Housings**
Pharmaseal Exhaust AP
Page 126



**Housings & Frames -
Terminal Filter Housings**
Slimline RSR
Page 127



**Housings & Frames - Filter
Containment Systems**
CamSafe 2: Safe change
filter casing BIBO
Page 128



**Housings & Frames - Filter
Containment Systems**
CamBox
Page 129



**Housings & Frames - Filter
Containment Systems**
CamContain
Page 130



**Housings & Frames - Filter
Housing**
CamCube HF, filter housings
for bag filters
Page 131



**Housings & Frames - Filter
Housing**
FCBS-A
Page 133



**Housings & Frames - Filter
Housing**
FCBL-CC
Page 134



**Housings & Frames - Filter
Holding Frames**
Absolute Filter Holding Frame
Page 135



**Housings & Frames - Filter
Holding Frames**
Universal Holding Frames
Page 136



**Speciality Filters - High
Temperature**
Termikfil 2000
Page 137



**Speciality Filters - High
Temperature**
Airopac® HT-HF
Page 141



**Speciality Filters - High
Temperature**
Absolute® 1FRK
Page 138



**Speciality Filters - High
Temperature**
Absolute® 1FRSI
Page 139



**Speciality Filters - High
Temperature**
Sofilair HT 120 - H13
Page 140





Speciality Filters - Gas Turbines
30/30 GT
Page 142



Speciality Filters - Gas Turbines
30/30[®] WR
Page 143



Speciality Filters - Gas Turbines
CamClose Compact
Page 144



Speciality Filters - Gas Turbines
CamClose G4 - M6
Page 145



Speciality Filters - Gas Turbines
Hi-Cap[®] GT
Page 146



Speciality Filters - Gas Turbines
Cam-Flo XMGT
Page 147



Speciality Filters - Gas Turbines
Cam-Flo XLGT
Page 148



Speciality Filters - Gas Turbines
Cam GT[®] Green
Page 149



Speciality Filters - Gas Turbines
Cam GT[®] Box Type Green II
Page 150



Speciality Filters - Gas Turbines
CamGT 4V-300
Page 151



Speciality Filters - Gas Turbines
CamGT 3V-600
Page 152



Speciality Filters - Gas Turbines
Campulse GTC
Page 153



Speciality Filters - Gas Turbines
Campulse GTD
Page 154



Speciality Filters - Gas Turbines
CamPulse GT Polytech HE
Page 155



Speciality Filters - Gas Turbines
Tenkay GTC/GTD/PolyTech HE
Page 156



Air Purifiers
CamCleaner 300
Page 157



Air Purifiers
CamCleaner 300 Concealed
Page 158



Air Purifiers
CamCleaner 800
Page 159



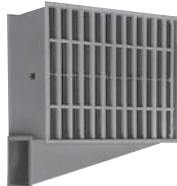
Air Purifiers
CamCleaner 2000
Page 160



Air Purifiers
CamCleaner 6000
Page 161



Air Purifiers
CamCleaner CITY
Page 164



Air Pollution Control - Dust collectors and filters
Dynavane
Page 165



Air Pollution Control - Dust collectors and filters
Gold Series®
Page 166



Air Pollution Control - Dust collectors and filters
Gold Series® Camtain
Page 168



Air Pollution Control - Dust collectors and filters
Zephyr III Portables
Page 169

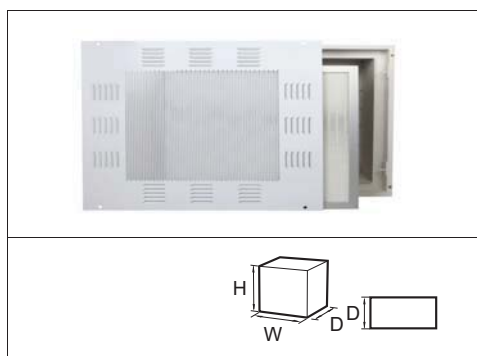


Air Pollution Control - Dust collectors and filters
HemiPleat® Gold Cone®
Page 170



Air Pollution Control - Dust collectors and filters
HemiPleat® Retrofit
Page 171

PHAP[®] Pharmaseal AP



Advantages

- Includes all essentials features for pharmaceutical and health care applications.
- Quick filter change, quick upstream aerosol injection & dispersion, quick aerosol sampling and pressure test.
- In-situ scanning with local penetration $\leq 0.01\%$ (typically) is guaranteed.
- Heavy duty aluminium fully welded to ensure air-tight housing.

Application: Non-unidirectional (turbulent) airflow clean rooms in pharmaceutical and health care applications.
Type: Ceiling-mount ducted, room-side operable air supply module with gel-seal HEPA/ULPA filters and butterfly damper.

Construction: Casing of 2.8 mm extruded aluminium with fully welded joints, powder coated as standard.

Filter seal: Self-healing, non-flowing silicon gel approved by Camfil for pharmaceutical applications..

Duct connection: Mould drawn one piece, seamless aluminium inlet collar sealed airtight to the back plate.

Damper: Room side adjustable heavy duty butterfly assembly with air diffusion disk for even airflow distribution.

Challenge aerosol: Quick-connect airtight nickel-plated brass port at room side. Integrated aerosol-dispersion assembly for even aerosol distribution.

Upstream aerosol sampling and pressure measurement: At room side, a quick-connecting airtight port for pressure drop measurement and upstream aerosol quick sampling to determine if the upstream aerosol concentration is sufficient for filter scanning test downstream.

Faceguard: Stainless steel or aluminium diffuser with swirling blades, perforated style diffuser available as option, powder-coated if required.

Installation: Suspended by 4 lifting eyes or rested on ceiling grid.

HEPA Supply Module

Reference	Model	Housing size (W x H x D) mm	Inlet size(mm)	Air flow / Pressure drop m ³ /h / Pa	In-situ scanning local min. efficiency @ 0.3µm	Volume m ³	Weight kg
Aluminum diffuser in center perforated and 4-way blades style							
4130005C	PHAP-476x476-A-TS-C10-A11-O-BS-A-P	476x476x254	250	500/205	99.99%	0.12	17.5
4130006C	PHAP-635x635-A-TS-C12-A11-O-BS-A-P	635x635x254	305	1000/205	99.99%	0.21	23
4130007C	PHAP-695x695-A-TS-C12-A11-O-BS-A-P	695x695x254	305	1250/205	99.99%	0.24	24.5
4130008C	PHAP-756x756-A-TS-C14-A11-O-BS-A-P	756x756x254	350	1500/205	99.99%	0.28	27
4130009C	PHAP-867x867-A-TS-C16-A11-O-BS-A-P	867x867x254	405	2000/210	99.99%	0.36	33
Aluminum diffuser in swirling style							
4130010C	PHAP-476x476-A-TS-C10-A31-O-BS-A-P	476x476x254	250	500/205	99.99%	0.12	17.5
4130011C	PHAP-635x635-A-TS-C12-A31-O-BS-A-P	635x635x254	305	1000/205	99.99%	0.21	23
4130012C	PHAP-695x695-A-TS-C12-A31-O-BS-A-P	695x695x254	305	1250/205	99.99%	0.24	24.5
4130013C	PHAP-756x756-A-TS-C14-A31-O-BS-A-P	756x756x254	350	1500/205	99.99%	0.28	27
4130014C	PHAP-867x867-A-TS-C16-A31-O-BS-A-P	867x867x254	405	2000/210	99.99%	0.36	33
Aluminum diffuser in fully perforated style; used at air velocity ≤ 0.5 m/s							
4130015C	PHAP-476x476-A-TS-C10-A21-O-BS-A-P	476x476x254	250	500/205	99.99%	0.12	17.5
4130016C	PHAP-635x635-A-TS-C12-A21-O-BS-A-P	635x635x254	305	1000/205	99.99%	0.21	23
4130017C	PHAP-695x695-A-TS-C12-A21-O-BS-A-P	695x695x254	305	1250/205	99.99%	0.24	24.5
4130018C	PHAP-756x756-A-TS-C14-A21-O-BS-A-P	756x756x254	350	1500/205	99.99%	0.28	27
4130019C	PHAP-867x867-A-TS-C16-A21-O-BS-A-P	867x867x254	405	2000/210	99.99%	0.36	33
SS304 diffuser in swirling style							
4120151C	PHAP-476x476-A-TS-C10-S30-O-BS-A-P	476x476x254	250	500/205	99.99%	0.12	19
4130001C	PHAP-635x635-A-TS-C12-S30-O-BS-A-P	635x635x254	305	1000/205	99.99%	0.21	26
4130002C	PHAP-695x695-A-TS-C12-S30-O-BS-A-P	695x695x254	305	1250/205	99.99%	0.24	28
4130003C	PHAP-756x756-A-TS-C14-S30-O-BS-A-P	756x756x254	350	1500/205	99.99%	0.28	31
4130004C	PHAP-867x867-A-TS-C16-S30-O-BS-A-P	867x867x254	405	2000/210	99.99%	0.36	38

1) Tolerance of pressure drop is $\pm 15\%$

2) Other dimensions are available on request

3) Only Ø305 and Ø350 inlet collars are mould drawn one-piece

*Note: Please refer to the next 2 tables of "Model number system" for model selection per detail options.'

Housings & Frames - Terminal Filter Housings

Model Number System for HEPA Supply Module

PHAP-	695 X 695-	A-	TS-	C12-	S	1	0-	0-	BS-	A-	P-
1	2	3	4	5	6	7	8	9	10	11	12

Naming Description

1. Product :	Pharmaseal AP HEPA supply module				
2. Hood standard size: (Length x Width (mm) (excl. trim)*if other sizes, please state)	476x476	635x635	695x695	756x756	867x867
3. Hood construction material:	A = Heavy duty extruded Aluminium (standard)	S = Stainless Steel 304# (optional)			
4. Inlet location:	TS=Top Side(standard)	SS=Side			
5. Inlet style and size: Mould-drawn top Inlet collar and top plate of one-piece aluminium (standard):	C12=Round, → 12"=305mm	C14=Round, →14"=350mm	Other sizes are fully welded instead of mould-drawn one piece		
6. Outlet diffuser material:	A = Aluminium	S = Stainless steel 304			
7. Diffuser style:	1= center perforated and 4-way blades surrounded	2= Fully perforated style	3= Swirling	4= Other style (specify separately)	
8. Diffuser surface treatment:	1= Powder coated (standard color RAL9016 or specify)	0 = No coating			
9. Diffuser location:	I= Inside the hood (within)	O= Outside the hood (extended)			
10. Damper:	BS= Butterfly damper, Stainless steel 304	NO= No damper			
11. Aerosol injection and dispersion:	A= Yes (air tight quick connect)	N= No			
12. Upstream aerosol sampling:	P= Yes (air tight quick-connect)	N= No			

Filter Element

Reference	Model	PHF size (A x B x H) mm	Housing size (W x H x D) mm	Air flow / Pressure drop m ³ /h / Pa	Efficiency	Volume m ³	Weight kg
15218202C	PHF-LSS- 416x416- 01/22	416x416x110	476x476x254	500 / 205	H14	0.02	4.1
15218215C	PHF-LSS- 575x575- 01/22	575x575x110	635x635x254	1000 / 205	H14	0.04	6.5
15218208C	PHF-LSS- 635x635- 01/22	635x635x110	695x695x254	1250 / 205	H14	0.04	7.6
15218213C	PHF-LSS- 696x696x 01/22	696x696x110	756x756x254	1500 / 205	H14	0.05	8.8
15218232C	PHF-LSS- 807x807- 01/22	807x807x110	867x867x254	2000 / 210	H14	0.07	12.2

1)Tolerance of pressure drop is +/-15%

2)Other dimensions are available on request

*Note: Please refer to the next 2 tables of "Model number system" for model selection per detail options.

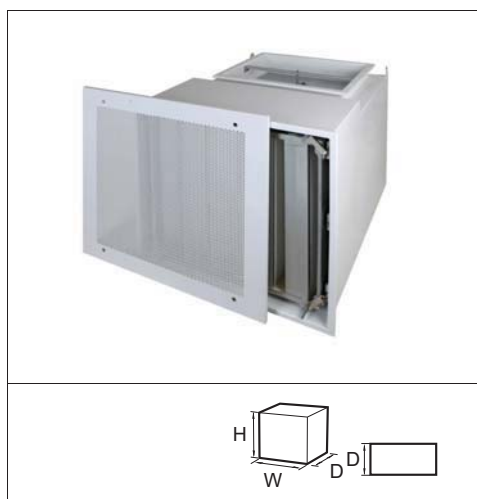
Model Number System for Filter Element

PHF-	LSS-	635X635-	01/	22
1	2	3	4	5

Naming description

1. Product	Pharmaseal-AP filter element					
2. Seal between filter and hood:	LSS: Liquid Seal, Special (Silicon gel)					
3. Filter standard size (width x height) mm:	416 x 416	575x575	635 x 635	696x696	807x807	Other odd sizes required, please specify.
4.Seal groove location:	01: Air outlet side(standard)	10: Air inlet side				
5. Face guard:	22: Both sides (standard)					

Pharmaseal Exhaust AP



Advantages

- Includes all essential functions for pharmaceutical and bio-cleanroom applications.
- In-situ efficiency 99.97% or higher is guaranteed.
- High capacity "V"-bank HEPA filter inside results in low pressure drop, low energy cost and long service life.
- Heavy duty aluminium or stainless steel fully welded to ensure the air-tight robust construction
- All ports of injection and samplings are of air tight quick-connection design.

Application: Exhaust/return air system for pharmaceutical and bio-cleanroom applications.

Type: Wall-mount, room side operatable, efficiency tested exhaust/return air housing with Sofilair filters.

Construction: Aluminium or stainless steel 304 fully welded, powder coated if required.

Filter seal: Endless PU gasket on filter.

Outlet connection: Flanged rectangular duct connection.

Damper: Room-side adjustable butterfly damper assembly, stainless steel #304.

Room-side grill: Stainless steel 304, or aluminium painted.

Auxiliary test shroud: Movable room-side, functions for upstream aerosol injection and dispersion, upstream & downstream aerosol sampling.

Accessory: Downstream sampling kit along with every housing supplied.

Installation: Side wall mounted with site-made metal brackets (instructed but not supplied by Camfil).

Reference	Model	Housing Dimensions (W x H x D) mm	Outlet size mm	HEPA size mm	Prefilter size mm	Volume m ³	Weight kg
4200007C	PWAP- 670x670- S- A21- BS	670x670x880	500x400	610x610x292	594x594x45	0.46	26
4200008C	PWAP- 670x365- S- A21- BS	365x670x880	250x400	305x610x292	289x594x45	0.29	17

Note: Tolerance of the pressure drop data within +/-20% as standard. Please refer to next table "Model Number System" for model selection per detail options.

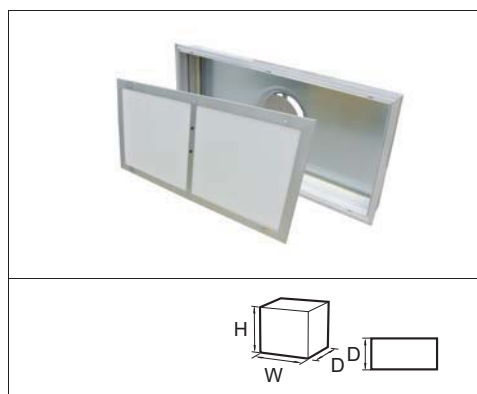
Model Number System

PWAP-	670x670-	S-	S	2	0	BS-
1	2	3	4	5	6	7

Naming description

1. Product :	Pharmaseal AP Wall Mount Exhaust/Return Air HEPA Housing
2. Housing standard 2 sizes: Width x Height (excl. trim) x Depth (mm)	670 x 670 x 880 (with Sofilair filter 610x610x292mm) 670 x 365 x 880 (with Sofilair filter 305x610x292mm)
3. Outlet location:	S = Side outlet (for upwards or downwards), standard B = Back outlet
4. Diffuser material:	S = Stainless steel #304 A = Aluminium
5. Diffuser style:	2 = Fully perforated, standard
6. Diffuser surface coating:	0 = No treatment or coating 1 = Powder coated, RAL9016, for other color, please separately 2 = Other style, please state separately
7. Damper at outlet:	BS = Butterfly damper, stainless steel #304 NO = No damper

Slimline RSR



Advantages

- Low profile
- Room side replaceable HEPA filter module
- Housing can be installed from room and top side
- Gap free, architecturally pleasing room side surface
- Adjustable room side diffusion disc
- Gel seal between filter and housing
- Noise reducing rounded collar
- Welded housing

Filter:

Application: Microelectronic, hospitals, life science.

Type: HEPA filter panel with fluid seal.

Frame: Anodized extruded aluminium.

Gel: Polyurethane gel.

Media: Glass fibre.

Separator: Hot-melt.

Sealant: Polyurethane.

Faceguard: Expanded metal, powder coated, white RAL 9016.

Gasket: Neoprene or poron.

EN 1822:2009 filter class: H13.

MPPS efficiency: H13: $\geq 99.95\%$.

DOP efficiency: $\geq 99.99\%$.

Max. temperature: 70°C.

Fire rating: UL 900.

Housing:

Frame: Extruded aluminium.

Back plate: Hot dipped galvanized steel.

Filter

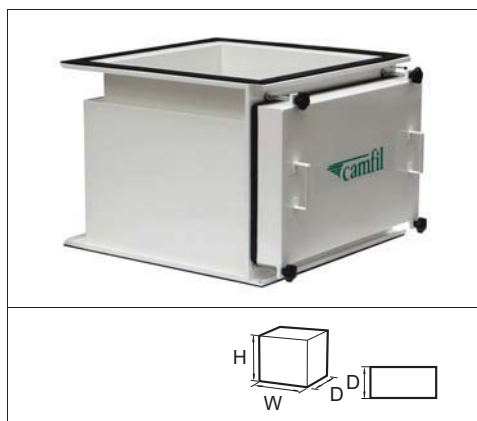
Reference	Model	Dimensions(WxH)mm	Filter Classification EN 1822:2009	Media area m ²	Airflow/pressure drop m ³ / hr / Pa	Unit Weight kg	Unit Volume m ³
15290001	Slimline RSR - 600*600	600 x 600	H13	8	435/130	4.7	0.04
15290002	Slimline RSR - 905*600	905 x 600	H13	12.4	680/128	6.6	0.06
15290003	Slimline RSR - 1210*600	1210 x 600	H13	16.8	947/130	7.9	0.08

Housing

Reference	Type	Nominal dimensions (WxHxD) mm	Collar size ø	Media area m ²	Unit Weight kg	Unit Volume m ³
4109001	SLM Housing 600*600 ø250	600 x 600 x 133	250	8	8.9	0.09
4109002	SLM Housing 905*600 ø305	905 x 600 x 133	305	12.4	9.8	0.13
4109003	SLM Housing 1210*600 ø305	1210 x 600 x 133	305	16.8	10.7	0.17

* Other dimensions, finishes and different options are available on request.

CamSafe 2: Safe change filter casing Bag In Bag Out (BIBO) - painted version



Advantages

- Contact free filter change
- Automatic tension regulating filter clamping device
- Fast secure filter installation, lever operated
- Optional filter seal seating test as per DIN 1946, Part 4
- Sealed, welded, solid design
- Tightness class B as per EN 1866 at 5000 Pa
- Ready flanged
- CamSafe connecting pieces can be supplied in various designs
- CREO Approved

Application: CamSafe chambers are used when filtering radioactive, toxic or bacterial particles and gasses and provide maximum safety for the operator. Areas of use include laboratories, isolation wards and the pharmaceutical industry. The casings can be joined together so that multi-stage filter systems with a volume flow of up to 24,000 m³/h can be achieved.

Epoxy coated casing: Epoxy resin coating in RAL 9010 which is capable of being decontaminated, clamping device made from high grade steel 1.4301.

Steel casing: Manufactured in high grade steel 1.4301.

Standard design: Material thickness 2mm, flange drilled ready for operation, service cover with male thread hand knobs, changing bag, support shelf for contact free filter changing, automatic tension regulating filter clamping device.

Options: Filter seal seating test device in accordance with DIN 1946 Part 4, pressure compensation device and pressure check points.

Filter cartridges:

Prefilter P1: 610x610x47mm .

Prefilter P2: 610x610x292mm.

Main filter: 610x610x292mm.

All main filters come equipped with straps to aid the handling, enabling them to be changed easily.

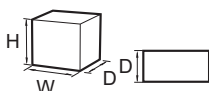
The filters can be supplied with a variety of gaskets to suit the application.

The casing is suitable for different classes of filter, suitable for dealing with glasses or particle contamination.

Accessories: Safe change bags, manometers and material for the flanged joints supplied on request.

Model	Type	Size (WxHxD*) mm	Filters 1st row	Filters terminal	Flange mm	Weight kg	Volume m ³
CamSafe 2	Painted Housing 450	730x535x510	-	305x610x292	730x420	0.2	38
CamSafe 2	Painted Housing P1/450	730x790x510	305x610x48	305x610x292	730x420	0.3	60
CamSafe 2	Painted Housing 1000	730x535x815	-	610x610x292	730x725	0.4	44
CamSafe 2	Painted Housing P1/1000	730x790x815	610x610x48	610x610x292	730x725	0.5	69

CamBox



APPROVED

Advantages

- Simple filter installation
- Available with safe change bag for contact-free filter change
- Available for different types of filters and sizes
- Available with screw or hinged inspection hatch
- Available in full or half-size module

Application: For the removal of hazardous dust and gas in laboratories, radiology departments and isolation wards.

Filter housings, painted: Epoxy resin coating, RAL 7037, clamping device made of stainless steel SS2333.

Filter housing stainless: Manufactured in AISI 304 stainless steel.

Filter housing stainless: Manufactured in AISI 316 corrosion-resistant stainless steel.

Standard: Connection for Ø315 mm or Ø200 mm flexible duct.

Optional: Ø 315 mm welded flange with connector for pressure drop measurement.

Door: Flat service cover.

Optional: Inspection hatch or special door for contamination-free change of changing bag.

Note: * Inspection hatch have separate article numbers.

Filter: Absolute or Micretain model 450 and 1000, filter class E11-H14 according to EN 1822. Also Airopac model 3CPM-122412 and 3CPM-242412, filter class M6, F8 according to EN779:2012.

Type	Dimension (WxHxD) mm
Cambox 450, painted 200 mm duct	310x710x610
Cambox 1000, painted/ 315 mm duct	615x710x610
Cambox 450, painted/flanges	310x710x610
Cambox 1000, painted/flanges	615x710x610
Cambox 1000, stainless/duct	615x710x610
Cambox 1000, stainless/flanges	615x710x610

Accessories / options:

Inspection hatch/painted

Inspection hatch/stainless

Service door/painted

Service door/stainless

Safe change bag/painted

Safe change bag/stainless

Manometers

Rubber ring for a safe change bag

Safe change bag, standard, without the rubber ring

Safe change bag Nuclear

Swivel joint wrench 10/11

CamContain



Advantages

- Complete self-contained air filtration systems for removal of hazardous contaminants
- Performance matched and optimized components

Typical applications: Hospital isolation rooms/wards and Intensive Care Units (ICUs) for the control of airborne pathogens, viral contaminants and infectious organisms.

Construction: Matched components can include bag-in/bag-out section, prefilter section, testing section and an optimized fan section.

Filters: Absolute® filters and various grades of ASHRAE grade filters for prefiltration.

Additional data: Consult factory or Product Sheet 3424 for additional information.

Advancing the Industry with Secure Containment Technology

- As a non-intrusive filter validation system (NIFV), an automatic scanning system allows for validation tests to be conducted while labs are operational, eliminating downtime and minimizing the risk of exposure to maintenance personnel or contamination to adjacent spaces. This results in a significantly lower Total Cost of Ownership (TCO).

- With a fully welded, pressure decay tested construction, CamContain ABS is 40 percent smaller than conventional filtration systems, greatly reducing the amount of space required for installation while still ensuring a uniform aerosol challenge distribution. The innovative configurable design allows for CamContain ABS to be positioned horizontally or vertically, and manipulated to accommodate a variety of duct combinations.

- The integrated platform of CamContain ABS incorporates a 360° rotatable, bubble-tight fitting option that can be configured for any type of inlet or outlet orientation.

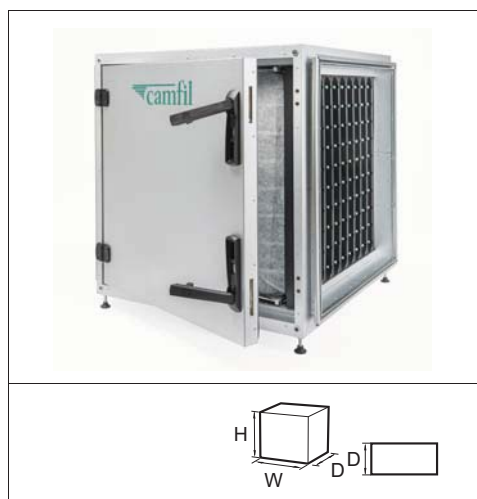
- Linear bio-seal dampers have been designed to ensure the long-term integrity of the system. Certified to be bubble-tight after 15,000 cycles, the dampers require 27.1 Newton Meters (20 Pound Feet) of torque to seal, a reduction of approximately 70 percent compared to conventional filtration dampers.

- The unique design of the CamContain ABS filtration housing ensures uniform particle distribution during the filtration cycle, and allows for effective decontamination in preparation of filter changes.



The CamContain Filter Validation System (FVS) is an integrated and intelligent auto-scanning software package that allows for validation tests to occur while labs are still active. Innovative in design, and configurable to meet proprietary requirements, the CamContain FVS increases the quality and accuracy of revalidation procedures by reducing exposure to test personnel and adjacent environments, while increasing the speed of in situ tests.

CamCube HF, filter housings for bag filters



Advantages

- Heat and condensation insulated
- Corrosivity class C4
- Leakage class C
- Easy to service
- Short delivery time

Filter housing materials: Zinc aluminium. On request in stainless steel (EN1.4301 SS).

Filter: Bag filters such as Hi-Flo XL and City-Flo XL. Compact filters such as Opakfil. See the relevant page in the catalogue for the technical data about filters

Air flow: The recommended air flow in a full module filter (592 x 592 mm) is 3,400 m³/h. See the relevant page in the catalogue for further information

Note: Left-hinged service hatch, can be changed on site

Accessories:

Adjustable feet (4 per set) reference 550902

Nipples for pressure drop supplied separately (2 per set) reference 550901

Nipples for pressure drop factory mounted (2 per set) reference 550900

Lockable handles

Flange connection

Prefilter mounting rail 50 or 100 mm

Product description

CamCube-HF is a flexible and compact range of filter housings for bag filters and other filter types with a 25 mm frame. Two stage filtration is available as an option with a prefilter mounting rail for panel filters. The cover is a sandwich design with 45 mm heat and condensation insulation, covered with aluzink sheet metal inside and outside (corrosivity class C4). The service hatch is hinged mounted. The endless gasket on the inside of the service hatch ensures a high degree of airtightness. The filter housing has a leakage class of C according to EN 15727.

When the service hatch is closed the newly developed clamping device ensures the clamping of the filter.

As standard the casing has M8 threads for mounting. The filter housing is supplied with a guide connection, and a flange connection is available as an option.

Descriptive text example:

Filter housing: CamCube HF-1010. Supplier, Camfil Svenska AB

Design: Sandwich construction with 45 mm heat and condensation insulation, covered with double aluzink sheet metal (corrosivity class C4). Leakage class C

Filter: 1 x Cityflo XL-592x592x640 F7

Accessories: One set of adjustable feet. Nipples for pressure drop, factory mounted.

Classification:

Leakage class C, according to the EN 15727:2010 standard. Leakage class L1 according to the EN 1886:2007 standard

Mechanical performance: D1 according to the EN 1886:2007 standard

Filterbypass test, highest class according to the EN 1886:2007 standard, up to filter class F9



M8 threads for mounting

Guide connection as standard



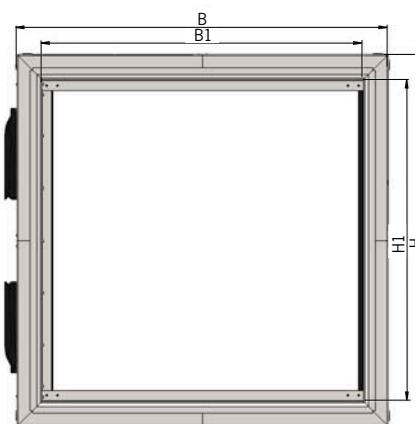
Endless gasket in the service hatch



Newly developed filter clamping

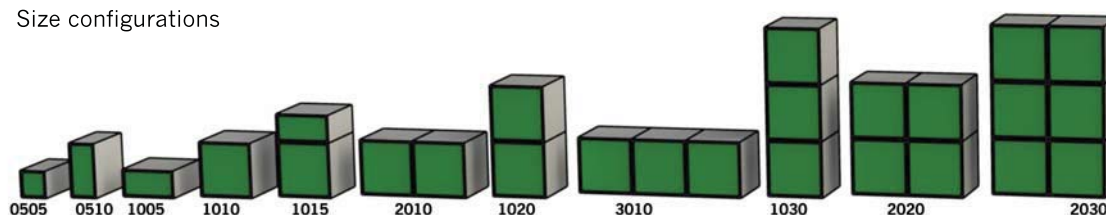
Adjustable feet as an option

Housings & Frames - Filter Housing



Part number	Type	External dimensions (BxH) mm	Connection dimensions (B1xH1) mm	Number of filters 592x592 mm	Number of filters 287x592 mm	Number of filters 592x287 mm	Number of filters 287x287 mm	Unit weight kg
550001	CamCube HF-0505	392x392	300x300				1	24
550002	CamCube HF-0510	392x692	300x600		1			34
550003	CamCube HF-1005	692x392	600x300			1		34
550004	CamCube HF-1010	692x692	600x600	1				43
550005	CamCube HF-1015	692x992	600x900	1		1		55
550006	CamCube HF-1020	692x1292	600x1200	2				64
550007	CamCube HF-1025	692x1592	600x1500	2		1		76
550008	CamCube HF-1030	692x1892	600x1800	3				85
550009	CamCube HF-1510	992x692	900x600	1	1			53
550010	CamCube HF-1515	992x992	900x900	1	1	1	1	66
550011	CamCube HF-1520	992x1292	900x1200	2	2			76
550012	CamCube HF-1525	992x1592	900x1500	2	2	1	1	89
550013	CamCube HF-1530	992x1892	900x1800	3	3			99
550014	CamCube HF-2010	1292x692	1200x600	2				62
550015	CamCube HF-2015	1292x992	1200x900	2		2		77
550016	CamCube HF-2020	1292x1292	1200x1200	4				86
550017	CamCube HF-2025	1292x1592	1200x1500	4		2		100
550018	CamCube HF-2030	1292x1892	1200x1800	6				109
550019	CamCube HF-2510	1592x692	1500x600	2	1			74
550020	CamCube HF-2515	1592x992	1500x900	2	1	2	1	89
550021	CamCube HF-2520	1592x1292	1500x1200	4	2			98
550022	CamCube HF-2525	1592x1592	1500x1500	3	2		1	113
550023	CamCube HF-2530	1592x1892	1500x1800	6	3			123
550024	CamCube HF-3010	1892x692	1800x600	3				83
550025	CamCube HF-3015	1892x992	1800x900	3		3		99
550026	CamCube HF-3020	1892x1292	1800x1200	6				108
550027	CamCube HF-3025	1892x1592	1800x1500	6		3		124
550028	CamCube HF-3030	1892x1892	1800x1800	9				134

Size configurations



FCBS-A



Advantages

- Easy to Install
- Modular construction
- No tools needed to change filters
- Gasket to seal between door and filter housing
- Easy servicing
- Stable and secure design

Housing: Galvanised steel.

Filters: Absolute, AIROPAC, MICRETAIN and SOFILAIR.

Alternative: Possibility to switch the housings 180° (flexibility to access from left or right side).

Please note: Stainless steel version is also available.

Type	Exterior dimensions (WxHxD) mm	Interior dimensions WxH mm	Number of filters 592x592 mm	Number of filters 287x592 mm	Unit volume m ³	Unit weight kg
FCBS-A 0510	399x744x500	309x614	-	1	0.15	20
FCBS-A 1005	704x439x500	614x309	-	1	0.16	20
FCBS-A 1010	704x744x500	614x614	1	-	0.27	26
FCBS-A 1015	704x1055x500	614x925	1	1	0.38	41
FCBS-A 1020	704x1360x500	614x1230	2	-	0.49	46
FCBS-A 1025	704x1670x500	614x1540	2	-	0.6	59
FCBS-A 1030	704x1975x500	614x1845	3	-	0.71	68
FCBS-A 1510	1013x744x500	923x614	1	-	0.39	37
FCBS-A 1520	1013x1360x500	923x1230	2	2	0.7	62
FCBS-A 1530	1013x1975x500	923x1845	3	3	1.03	88
FCBS-A 2010	1318x744x500	1228x614	2	-	0.5	42
FCBS-A 2015	1318x1055x500	1228x925	2	2	0.71	68
FCBS-A 2020	1318x1360x500	1228x1228	4	-	0.92	72
FCBS-A 2025	1318x1670x500	1228x1540	4	2	1.13	95
FCBS-A 2030	1318x1975x500	1228x1845	6	-	1.33	101
FCBS-A 2510	1677x744x500	1537x614	2	1	0.64	51
FCBS-A 2520	1677x1360x500	1537x1230	4	2	1.17	89
FCBS-A 2530	1677x1975x500	1537x1845	6	3	1.7	126
FCBS-A 3010	1982x744x500	1842x614	3	-	0.76	59
FCBS-A 3015	1982x1055x500	1842x925	3	3	1.07	89
FCBS-A 3020	1982x1360x500	1842x1230	6	-	1.38	98
FCBS-A 3025	1982x1670x500	1842x1540	6	3	1.7	130
FCBS-A 3030	1982x1975x500	1842x1842	9	-	2	138

Other dimensions and arrangements available on request

FCBL-CC



Advantages

- Easy to Install
- No tools needed to change filters
- Gasket to seal between door and filter housing
- Stable and secure design
- Modular construction
- Easy servicing
- CREO Approved

Housing: Galvanised steel.

Filters: Carbon cylinders 1000, 2000 or 2600.

Carbon CM05: For odours and VOC's.

Carbon CM07: For gases as H₂S, SO₂, NH₃.

Alternative: Possibility to switch the housings 180° (flexibility to access from left or right side).

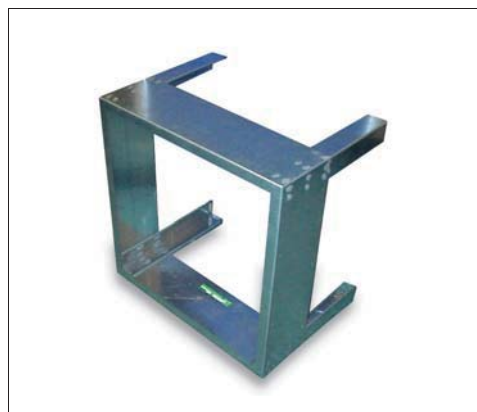
Please note: Stainless steel version is also available



Type	Exterior dimensions (WxHxD) mm	Interior dimension (WxH) mm	Number of cylinders	Unit volume m ³	Unit weight kg
FCBL-CC 0510	399x744x750	309x610	8	0.23	25.5
FCBL-CC 1005	704x439x750	614x309	8	0.24	25.5
FCBL-CC 1010	704x744x750	614x614	16	0.4	33
FCBL-CC 1015	704x1055x750	614x925	24	0.57	49.5
FCBL-CC 1020	704x1360x750	614x1230	32	0.73	58.5
FCBL-CC 1025	704x1670x750	614x1540	40	0.9	75
FCBL-CC 1030	704x1975x750	614x1845	48	1.06	82.5
FCBL-CC 1510	1013x744x750	923x614	24	0.58	45
FCBL-CC 1520	1013x1360x750	923x1230	48	1.05	75
FCBL-CC 1530	1013x1975x750	923x1845	72	1.53	110
FCBL-CC 2010	1318x744x750	1228x614	32	0.75	53
FCBL-CC 2015	1318x1055x750	1228x925	48	1.06	80.5
FCBL-CC 2020	1318x1360x750	1228x1228	64	1.37	91.5
FCBL-CC 2025	1318x1670x750	1228x1540	80	1.68	118
FCBL-CC 2030	1318x1975x750	1228x1845	96	1.99	128.5
FCBL-CC 2510	1677x744x750	1537x614	40	0.95	65
FCBL-CC 2520	1677x1360x750	1537x1230	80	1.74	111
FCBL-CC 2530	1677x1975x750	1537x1845	120	2.53	157.5
FCBL-CC 3010	1982x744x750	1842x614	48	1.13	72.5
FCBL-CC 3015	1982x1055x750	1842x925	72	1.6	111
FCBL-CC 3020	1982x1360x750	1842x1230	96	2.06	124.5
FCBL-CC 3025	1982x1670x750	1842x1540	120	2.53	161.5
FCBL-CC 3030	1982x1975x750	1842x1842	144	2.99	175

Other dimensions and arrangements available on request

Absolute Filter Holding Frame



Advantages

- Modular design adaptable for all types of installations
- Location dimples in frame ensure correct filter fitting
- Pre drilled for easy assembly
- Filter holding clips can be easily replaced as required

Application: Mounting very high efficiency filters in air conditioning units and systems.

Type: Front access filter holding frame.

Construction: Galvanised steel or stainless steel.

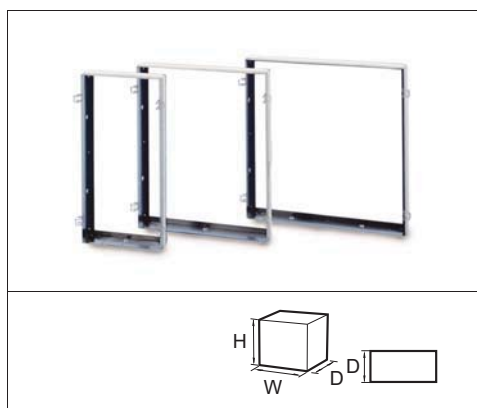
Filter Types: Absolute and Micretain very high efficiency filters.

Filter fixing: Using 4 corner mounted clips.

Reference	Type	Exterior dimensions (WxHxD) mm	Filter dimension (WxHxD) mm	Unit weight kg	Unit volume m ³
5107.06.01	Galvanised steel	626x626x335	610x610x292	12.5	0.13
5107.24.01	Galvanised steel	626x321x335	610x305x292	10.0	0.07
5107.60.01	Galvanised steel	610x610x335	595x595x292	12.3	0.12
5107.50.01	Galvanised steel	610x305x335	595x290x292	9.9	0.06
5107.06.02	Stainless steel	626x626x335	610x610x292	12.5	0.13
5107.24.02	Stainless steel	626x321x335	610x305x292	10.0	0.07
5107.60.02	Stainless steel	610x610x335	595x595x292	12.3	0.12
5107.50.02	Stainless steel	610x305x335	595x290x292	9.9	0.06

Other dimensions and arrangements available on request.

Universal Holding Frames



Advantages

- Robust rigid construction
- Pre drilled for easy assembly
- Filter holding clips can be easily replaced as required
- Modular design adaptable for all types of installations
- Location dimples in frame ensure correct filter fitting

Application: Mounting air filters in air conditioning systems.

Type: Front access filter holding frame.

Construction: Galvanised steel.

Gasket: Type 4: endless PU; Type 8: PU foam.

Filter Types: Pre-filters and header frame type filters.

Filter fixing: Using 4 corner mounted clips, to suit the installed filter.

Note: Remember to order the frame and the appropriate clips.

Frame

Reference	Type	Exterior dimensions (WxH) mm	Clips included	Unit weight kg	Unit volume m ³
4300001	Frame 4SPXM	608x608x76	Yes	3	0.028
4300003	Frame 4URZO	303x608x76	Yes	2.2	0.014
430F-4300104	Type 8 Holding Frame 24x12"	303x608x68	No	2,2	0.014
430F-4300101	Type 8 Holding Frame 24x24"	608x608x68	No	3	0.028

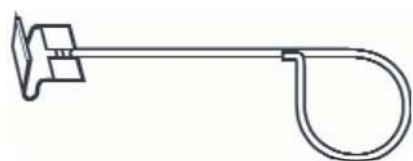
* Stainless steel is available on request.

Clips

Reference	Type	Model	Exterior dimensions (WxH) mm	Clips included	Unit weight kg	Unit volume m3
6999-10001	Clip	C70	-	-	-	-
6999-10002	Clip	C78-3	-	-	-	-
6999-10003	Clip	C78-4	-	-	-	-
6999-10004	Clip	C78-5	-	-	-	-

Recommended clips for Type 8 frame

Prefilter	Secondary filter	Recommended clip	Number of clips required
1"	None	C70	4
2"	None	C70	4
4"	None	C78-4	4
None	With 25 or 20mm header	C70	4
1"	With 25 or 20mm header	C70	4
2"	With 25 or 20mm header	C78-3	4
4"	With 25 or 20mm header	C78-5	4

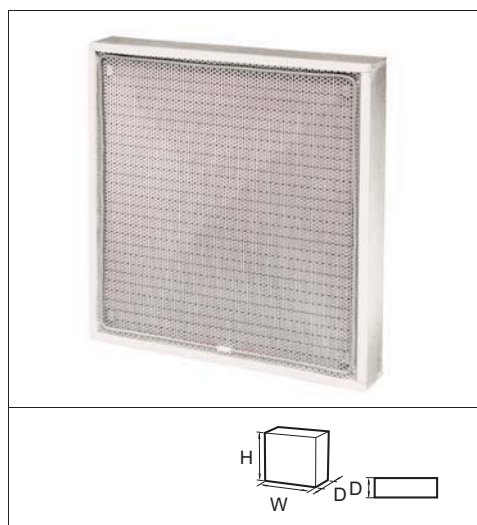


C- 78 SERIES



C-70

Termikfil 2000



Advantages

- Meets FDA requirements
- Maximum continuous operating temperature 350°C, efficiency 99,99% at 0,3 µm
- Ceramic frame
- Efficiency tested after precuring
- Exclusive precuring process at 300°C carried out in the plant

Application: Protection of ultra-clean processes at high temperature, sterilisation tunnels in the pharmaceutical industry.

Type: Very high efficiency panel resistant to 350°C in continuous service.

Frame: Composite ceramic.

Gasket: Rolled glass fibre paper + 6mm dia glass braid.

Media: Glass fibre.

Separator: Glass strands.

Sealant: Ceramic.

Faceguard: Upstream and downstream in stainless steel.

DOP efficiency: ≥ 99.99%.

Maximum local penetration: 0.01% conforming to FDA requirements.

Recommended final pressure drop: 350 Pa.

Temperature: Up to 350°C in continuous service.

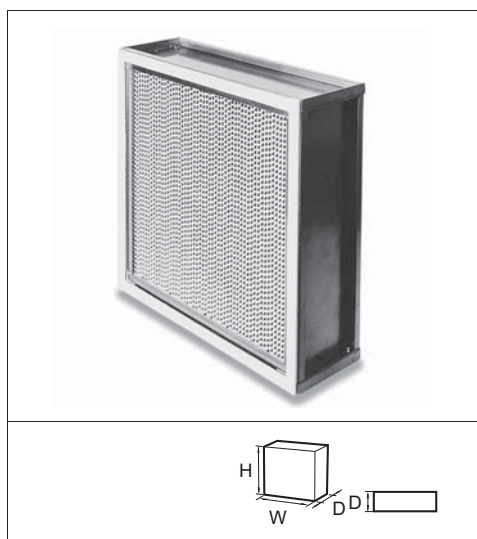
Test: 100% after thermal treatment at 300°C.

Mounting: A stainless steel adaptor frame can be supplied to reach the thickness of 150mm or 292mm.

NB: To reduce fume emission when starting up, TERMIKFIIL undergoes a specific precuring cycle in the factory at 300°C using an exclusive CAMFIL FARR process.

References	Type	Model	Dimensions (WxHxD) mm	Efficiency at 0.30µm %	Media area m ²	Air flow/pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
3415.07.00	TERMIKFIIL	4P4	457x457x84	99.9	5.0	675/250	3	0.04
3415.06.00	TERMIKFIIL	3P3	305x305x84	99.9	2.9	300/250	2	0.01
3415.01.00	TERMIKFIIL	3P6	305x610x84	99.9	5.9	600/250	4	0.02
3415.02.00	TERMIKFIIL	6P6	610x610x84	99.9	12.1	1200/250	5	0.04
3415.05.00	TERMIKFIIL	4P6	457x610x84	99.9	8.9	900/250	4	0.03
3415.03.00	TERMIKFIIL	7P6	762x610x84	99.9	15.3	1500/250	6	0.05
3415.04.00	TERMIKFIIL	9P6	915x610x84	99.9	18.5	1800/250	8	0.06

Absolute® 1FRK



Advantages

- Temperature resistant up to 350°C
- High air flow
- 99,95% at MPPS with DEHS

Application: Protection for clean processes at high temperature

Type: HEPA-Filter

Frame: Stainless steel

Gasket: Glass fibre, cord seal

Media: Glass fibre

Separators: Aluminium

Sealant: Ceramic

Efficiency acc. EN 1822:2009: H13

MPPS efficiency acc. EN 1822:2009: ≥99,97% at 0,3µm, ≥99,95% at MPPS, measured at 20°C with DEHS

Recommended final pressure drop: 500 Pa

Temperature / Humidity: 350°C / 100% RH

Filter packed in plastic film. Due to the different thermal expansion coefficients of the individual filter components the ceramic potting may form cracks during the tempering process. At operating temperature (350°C) these filters have an overall efficiency of 99,97% at 0,3µm, leakages are possible.

Model	Width	Height	Depth	Filter class	Air flow m ³ /h	Pressure drop	Area m ²	Volume m ³	Weight kg
1FRK- 220-1W	305	610	150	H13	580	250	5,40	6,00	0,040
1FRK- 300-1W	457	457	150	H13	660	250	5,90	8,00	0,050
1FRK- 350-1W	457	610	150	H13	920	250	8,50	10,00	0,070
1FRK- 600-1W	610	610	150	H13	1245	250	11,40	12,00	0,070
1FRK- 980-1W	914	610	150	H13	1925	250	17,10	16,00	0,110
1FRK- 450-1W	305	610	292	H13	980	250	10,40	9,00	0,060
1FRK- 725-1W	610	457	292	H13	1500	250	16,40	13,00	0,080
1FRK-830-0	762	610	292	H13	1500	250	13,50	14,50	0,120
1FRK-1000-1W	610	610	292	H13	2050	250	22,50	17,00	0,120
1FRK-1250-1W	762	610	292	H13	2650	250	28,40	21,00	0,170

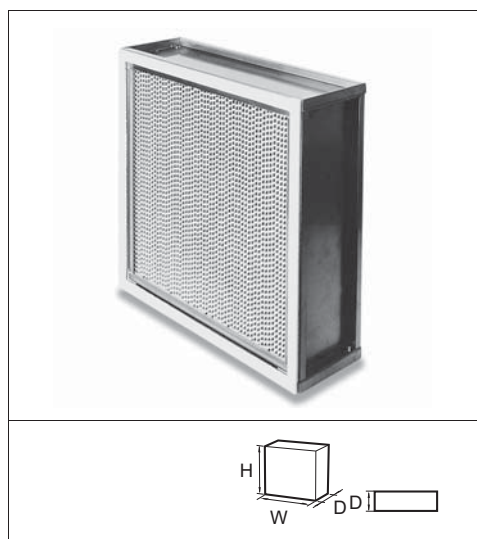
Modell -1W = Gasket upstream (standard)

Modell -01W = Gasket downstream

Modell -2W = Gasket both sides

Modell -0 = no gasket

Absolute® 1FRSI



Advantages

- 99.97% DOP
- High temperature resistant (up to 250°C)

Application: Protection of ultra-clean processes at high-temperatures.

Frame: Stainless steel.

Gasket: High temperature silicone.

Media: Glass fibre.

Separator: Aluminium.

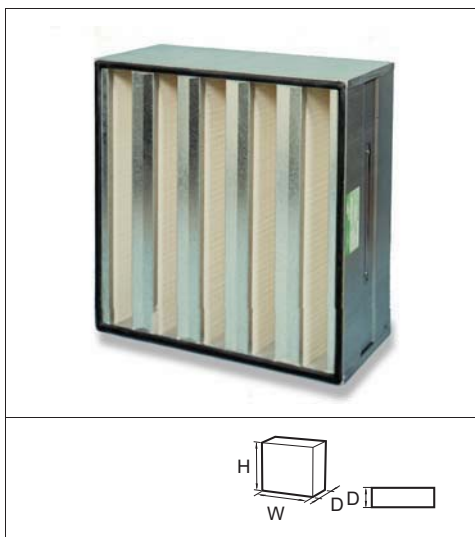
Sealant: High temperature silicon.

DOP efficiency: 99.97%.

Temperature: ≤250°C.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN 1822:2009	Media area m ²	Air flow/ pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
162610GBC	1FRSI-25-1SIHT	203x203x78	H13	0.5	50/250	1.3	0.01
162610LBC	1FRSI-50-1SIHT	203x203x150	H13	0.9	90/250	2.5	0.01
162610QBC	1FRSI-110-1SIHT	305x305x150	H13	2.4	250/250	3.8	0.02
162610WBC	1FRSI-200-1SIHT	305x305x292	H13	5.1	410/250	7.5	0.03
162611HBC	1FRSI-300-1SIHT	457x457x150	H13	5.9	620/250	5.8	0.03
162611WBC	1FRSI-450-1SIHT	305x610x292	H13	10.4	900/250	10	0.03
162614ABC	1FRSI-600-1SIHT	610x610x150	H13	10.9	1180/250	7.5	0.06
162616PBC	1FRSI-725-1SIHT	457x610x292	H13	16.3	1420/250	13	0.05
162617HBC	1FRSI-830-1SIHT	762x610x150	H13	13.7	1500/250	9	0.07
162618ABC	1FRSI-980-1SIHT	915x610x150	H13	16.8	1800/250	11	0.08
162618HBC	1FRSI-1000-1SIHT	610x610x292	H13	22.5	1960/250	15	0.11
162619ABC	1FRSI-1250-1SIHT	762x610x292	H13	28.4	2500/250	16	0.14
162612ABC	1FRSI-457x457x292-1SIHT	457x457x292	H13	12.8	1030/250	11	0.06
162615ABC	1FRSI-610x457x150-1SIHT	610x457x150	H13	8.2	860/250	6.5	0.05
162616ABC	1FRSI-610x762x292-1SIHT	610x762x292	H13	28.2	2500/250	16	0.14

Sofilair HT 120 - H13



Advantages

- High air flow rates
- Withstand high temperature up to 120°C
- High filter surface area offers low pressure drop for energy savings and longer life
- Large media area

Applications: Industry and hospitals.

Type: HEPA filter with high airflow.

Frame: Galvanized steel with handle.

Media: Glassfiber paper.

Separator: Glassfiber threads.

Sealant: Polyurethane.

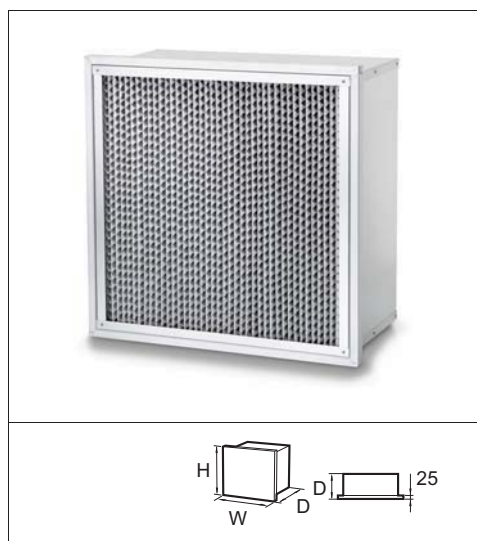
Gasket: Half-round neoprene Ø 15 mm moulded in one piece, ≥99.995% MPPS (H13 according to EN 1822), ≥ 99.99 % 0.3μ

Temperature: 120°C maximum continuous.

Mounting systems: FCBL-A housing.

Article Number	Model	Dimensions (WxHxD) mm	Media area m ²	Air flow/ Pressure drop m ³ /hr/Pa	Unit weight kg	Unit volume m ³
1561.02.00	SFR120-E-4000-H13	610 x 610 x 292	40	4000/250	23	0.11
1561.01.00	SFR120-E-3400-H13	610 x 610 x 292	33	3400/250	20	0.11
1564.01.00	SFR120-E-2500-H13	610 x 610 x 292	24	2500/25	19	0.11
1566.01.00	SFR120-E-1500-H13	305 x 610 x 292	16	1500/250	13	0.06
1567.01.50	SFR120-E-3200-H13	595 x 595 x 292	38	3200/250	22	0.11
1568.01.50	SFR120-E-1300-H13	289 x 595 x 292	16	1300/250	12	0.06

Airopac® HT-HF



Advantages

- High efficiency
- 260°C/385°C max operating temperature
- Silicon free construction
- Compact design

Application: Paint bake ovens and other high temperature applications.

Type: High efficiency, high temperature, silicon free compact filter.

Frame: Galvanised steel.

Gasket: Glass fibre.

Media: Glass fibre paper.

Separator: Corrugated aluminium.

Sealant: Glass fibre .

Grille: Galvanised steel upstream and downstream.

EN779:2012 filter class: M6, F8.

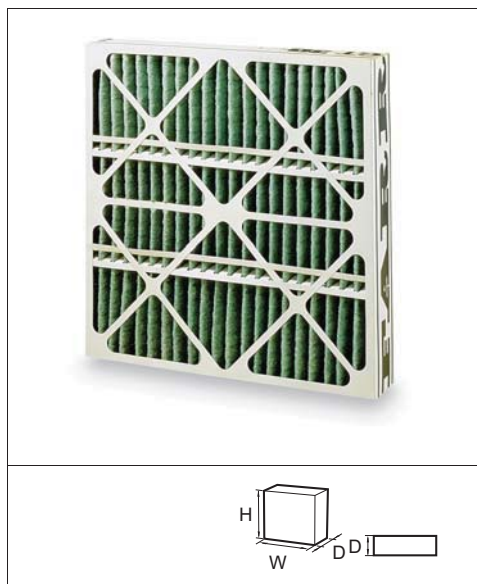
ASHRAE 52.2:2007 filter class: MERV 11, MERV 14.

Recommended final pressure drop: 250 Pa.

Temperature: 260°C maximum continuous, 385°C peak during 1 hour.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media surface m ²	Air flow/nominal pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
2180001	3CPM-HT-122412-60	305 x 610 x 292	M6	7.7	1700/80	5.6	0.062
2180002	3CPM-HT-242412-60	610 x 610 x 292	M6	15.9	3400/75	9.5	0.124
2180004	3CPM-HT-242406-60	610 x 610 x 150	M6	7.8	1700/30	5.6	0.124
2180005	3CPM-HT-122403-60	305 x 610 x 78	M6	2.4	750/30	2	0.02
2180006	3CPM-HT-242403-60	610 x 610 x 78	M6	4.9	1500/30	4	0.039
2181001	3CPM-HT-122412-90	305 x 610 x 292	F8	7.7	1700/120	5.6	0.062
2181002	3CPM-HT-242412-90	610 x 610 x 292	F8	15.9	3400/110	9.5	0.124
2181004	3CPM-HT-242406-90	610 x 610 x 150	F8	7.8	1700/65	5.6	0.072
2181005	3CPM-HT-122403-90	305 x 610 x 78	F8	2.4	750/80	2	0.02
2181006	3CPM-HT-242403-90	610 x 610 x 78	F8	4.9	1500/80	4	0.039
2181007	3CPM-HT-305*610*52-90	305 x 610 x 52	F8	2.7	750/90	1.8	0.015
2181008	3CPM-HT-610*610*52-90	610 x 610 x 52	F8	5.4	1500/90	3.6	0.035
2181009	3CPM-HT-480*480*78-90	480 x 480 x 78	F8	2.3	800/80	2.1	0.023
2181010	3CPM-HT-915*457*78-90	915 x 457 x 78	F8	5.7	2000/100	4.5	0.04
2181011	3CPM-HT-762*457*78-90	762 x 457 x 78	F8	3.6	1250/80	3.8	0.04
2190001	3CPM-HT-HF-242412-60	592 x 592 x 292	M6	13.3	3000/105	8.3	0.124
2191001	3CPM-HT-HF-242412-90	592 x 592 x 292	F8	13.3	3000/150	8.3	0.124

30/30 GT



Advantages

- Low initial pressure drop
- High dust holding capacity
- Low resistance to airflow over the service life of the filter
- Incinerable

Application: Prefilter to extend the service life of final filters.

Type: High performance disposable pleated panel filter.

Frame: High strength beverage board with diagonal supports.

Media: Blended cotton & polyester.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 8.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Unit volume m ³
540F-FG070205001	30/30 GT CL2 24x24x4	594x594x95	G4	2.5	3400/68	0.03
* 540F-FG402312001	30/30 GT CL2 24x24x4	594x594x95	G4	2.5	3400/68	0.03

* With gasket.

30/30® WR



Advantages

- Two-in-one performance - keeps out water and dirt.
- A multi-layered non-cellulose media, repels water, captures dust, lint, pollen and other particulate contaminants.
- Media bonded to the frame to eliminate air bypass
- Water resistant beverage board frame
- Large media surface

Applications: Primary filter for medium efficiency applications.

Type: High performance pleated panel filter.

Frame: High strength moisture resistant beverage board.

Media: Glass fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

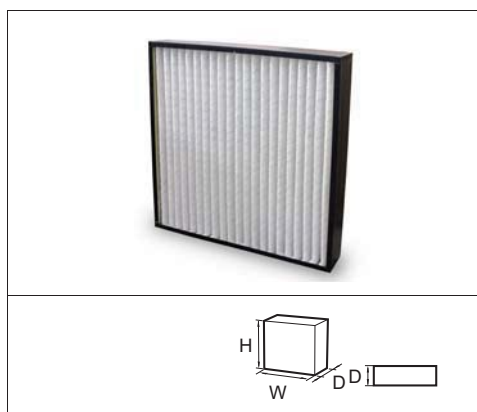
Recommended final pressure drop: 250 Pa.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Fire rating: UL 900.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m²	Air Flow / pressure drop m³/hr/Pa	Unit volume m³
125343005	30/30 WR 24x24x2	595x595x44	G4	2.61	3400/60	0.02
125343006	30/30 WR 24x12x2	289x595x44	G4	1.27	1700/60	0.01
402137001	30/30 WR 24x24x4	595x595x95	G4	4.24	3400/55	0.03
402137002	30/30 WR 24x12x4	289x595x95	G4	4.24	1700/55	0.02

CamClose Compact



Advantages

- High water removal efficiency
- High strength ABS frame
- High dust holding capacity
- Fully incinerable

Application: Pre-filter with high efficiency removal of water and mist with medium efficiency removal of airborne particulates.

Frame: ABS plastic.

Media: Synthetic, wire backed.

EN779:2012 filter class: G4.

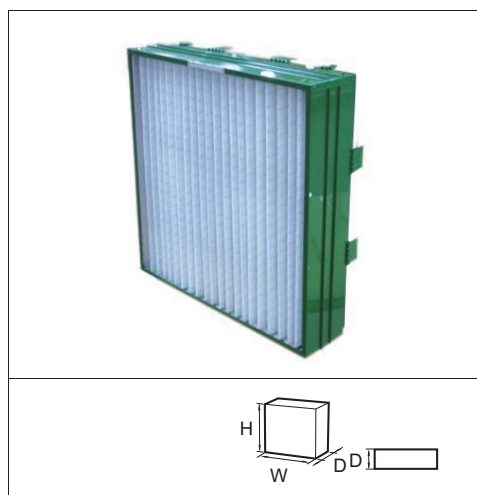
ASHRAE 52.2:2007 filter class: MERV 7.

Recommended final pressure drop: 450 Pa.

Fire rating: DIN 53438.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow/ pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
5302001	Camclose Compact-592*592*96-G4	592*592*96	G4	2.281	3400/43	1.765	0.03

CamClose G4 - M6



Advantages

- Low initial pressure drop
- High dust holding capacity
- Easy installation
- Incinerable
- Clips onto CamGT or Turbopac
- Low resistance to airflow over the service life of the filter

Application: Snap-on prefilter designed for use with Cam-GT and Opakfil GT(A) or Turbopac.

Frame: ABS.

Gasket: PU Foam.

Media: White synthetic media with downstream pleat separators are used to ensure optimum operation.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

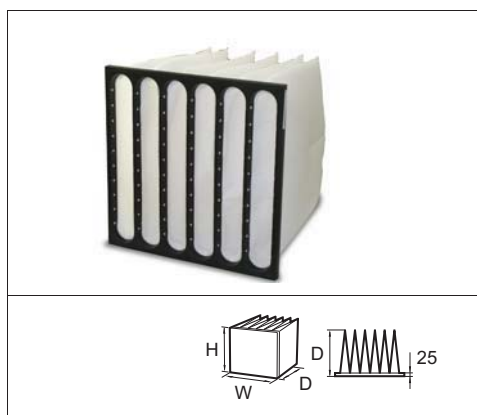
Recommended final pressure drop: 400 Pa.

Fire rating: DIN 53438.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow / pressure drop m ³ /hr/Pa	Dust holding capacity	Unit weight kg	Unit volume m ³
540F-FG402312002	CamClose GT 592*592*130-G4	592x592x130	G4	2.46	4250/77	780g	2.3	0.06
5301001	Camclose M6-592*592*130-02	592*592*130	M6	12.28	3400/95	313	5.42	0.04

*Note: Outermost dimension is 598x598mm at clip or guide location.

Hi-Cap® GT



Advantages

- Rigid self supporting pockets
- Robust plastic header frame
- High mechanical strength
- Welded pocket construction
- High dust holding capacity
- No metal parts

Application: Comfort air conditioning applications, gas turbines.

Type: Multi pocket bag filter.

Header frame: Plastic.

Media: Polyester fibre.

EN779:2012 filter class: G4.

ASHRAE 52.2:2007 filter class: MERV 7.

Recommended final pressure drop: 250 Pa.

Temperature: 70°C maximum in continuous service.

Holding frames: Front and side access housings and frames are available, Type 8 and FC Housings.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Number of pockets	Media area m²	Air flow / pressure drop m³/hr/Pa	Unit weight kg	Unit volume m³
3204013	Hi-Cap GT-287*592-3*360-G4	287 x 592 x 360	G4	3	1.3	1700/50	1.4	0.02
3204012	HiCap GT-592*592-6*360-G4	592 x 592 x 360	G4	6	2.6	3400/50	2.2	0.04
3204011	Hi-Cap GT-287*592-3*580-G4	287 x 592 x 580	G4	3	2.1	1700/30	2	0.025
3204009	Hi-Cap GT-592*592-6*580-G4	592 x 592 x 580	G4	6	4.2	3400/30	3.2	0.05

Cam-Flo XMGT



Advantages

- Improved synthetic media
- High dust holding capacity
- New design for better air distribution
- High mechanical strength

Application: Installations exposed to turbulence and/or recurrent high humidity.

Type: Bag filter.

Frame: Galvanized steel.

Media: Synthetic fiber.

Gasket: Neoprene.

Other: Available in reinforced version, with glued turbine lists.

EN779:2012 efficiency: M6, F7, F9.

ASHRAE 52.2.2007 filter class: Eq. to MERV 12, 13, 15.

Recommended final pressure drop: 450 Pa / 1.8"wg.

Temperature: 70° C / 158° F max. operating temperature.

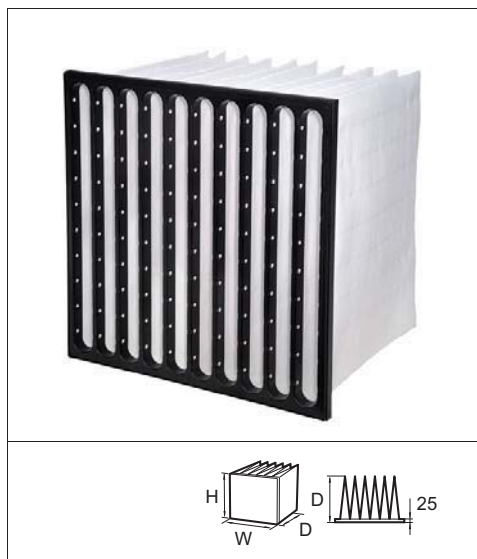
Width	Height	Depth	Filter class	Air Flow m³/h	Pressure drop	Number of pockets	Media area m²	Volume m³	Weight kg	Initial eff. %	ME %*	Energy class*	kWh/year*
592	592	640	M6	3400	60	10	7,5	0,060	3,00	26	21,0	C	1 047
592	592	640	F7	3400	90	10	7,5	0,060	3,00	60	58,0	A	1 120
592	592	640	F9	3400	106	10	7,5	0,060	3,00	72	71,0	A	1 317

* ME%: Minimum efficiency ref. to EN779:2012

* Energy Consumption, kWh/year: Calculated according to Eurovent Guideline 4/11

* Energy class: Calculated according to Eurovent

Cam-Flo XLGT



Advantages

- Improved synthetic media
- High dust holding capacity
- New design for better air distribution
- High mechanical strength

Application: Installations exposed to turbulence and/or recurrent high humidity.

Type: Bag filter.

Frame: Plastic.

Media: Synthetic multi layer media.

Gasket: Continuous PU or Neoprene.

EN779:2012 efficiency: M6, F7, F9.

ASHRAE 52.2.2007 filter class: Eq. to MERV 12, 13, 15.

Recommended final pressure drop: 450 Pa / 1.8"wg.

Temperature: 70° C / 158° F max. operating temperature.

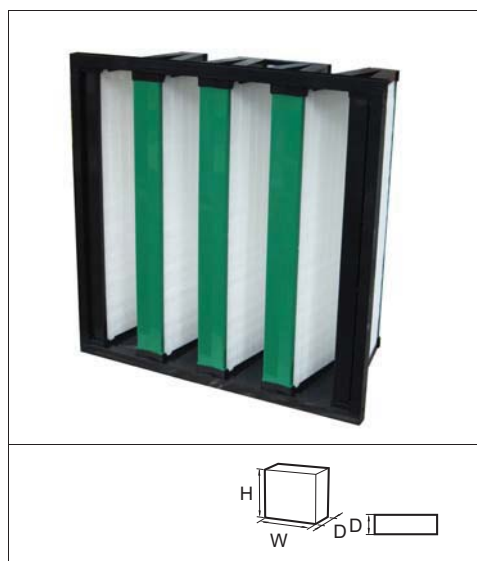
Width	Height	Depth	Filter class	Air Flow m³/h	Pressure drop	Number of pockets	Media area m²	Volyme m³	Weight kg	Initial eff. %	ME %*	Energy class*	kWh/year*
592	592	640	M6	3400	60	10	7,5	0,060	3,00	26	21,0	C	1 047
592	592	640	F7	3400	90	10	7,5	0,060	3,00	60	58,0	A	1 120
592	592	640	F9	3400	106	10	7,5	0,060	3,00	72	71,0	A	1 317

* ME%: Minimum efficiency ref. to EN779:2012

* Energy Consumption, kWh/year: Calculated according to Eurovent Guideline 4/11

* Energy class: Calculated according to Eurovent

Cam GT[®] Green



Advantages

- Can be used to upgrade existing installations
- Patented integrated water drainage
- Max burst pressure 7500 Pa
- Very robust construction
- Suitable for high humidity conditions
- Corrosion resistant

Application: Air intake for gas turbines compressors and large engines.

Type: High efficiency incinerable compact filter.

Frame: ABS.

Gasket: Endless polyurethane placed on the downstream side (code 01)

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Grid: Glass fibre reinforcement grid placed downstream.

EN 779:2012 filter class: F7, F8.

EN 1822:2009 filter class: E10.

ASHRAE 52.2:2007 filter class: MERV 13, MERV 14.

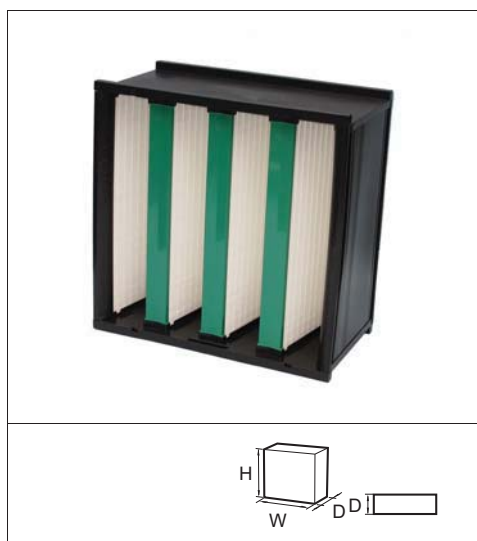
Recommended final pressure drop: 600 Pa.

Temperature: 80°C maximum in continuous service.

N.B: Burst pressure: ≥ 7500 Pa.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow/pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
2460001	CAM GT-242412-F7-01	592x592x292	F7	19	4250/120	7	0.11
2460002	CAM GT-241212-F7-01	592x287x292	F7	9	2125/145	5	0.05
2461002	CAM GT-242412-F8-01	592x592x292	F8	19	4250/140	7	0.11
2461003	CAM GT-241212-F8-01	592x287x292	F8	9	2125/170	5	0.05
2460003	CAM GT-242412-F9-01	592x592x292	F9	19	4250/165	7	0.11
2460004	CAM GT-241212-F9-01	592x287x292	F9	9	2125/180	5	0.05
2460005	CAM GT-242412-E10-01	592x592x292	E10	19	4250/230	7	0.11
2460006	CAM GT-241212-E10-01	592x287x292	E10	9	2125/250	5	0.05

Cam GT[®] Box Type Green II



Advantages

- Suitable for high humidity conditions
- Can be used to upgrade existing installations
- Burst pressure = 7500 Pa
- Corrosion resistant
- Very robust construction

Application: Air intake for gas turbines, compressors and large engines.

Type: High efficiency, incinerable compact filter.

Frame: High Impact PS and ABS.

Gasket: Endless polyurethane placed on the upstream side.

Media: Glass fibre paper.

Separator: Hot-melt beads.

Sealant: Polyurethane.

Grid: Glass fibre reinforcement grid placed downstream.

EN779:2012 filter class: F7, F9.

EN 1822:2009 filter class: E10.

ASHRAE 52.2:2007 filter class: MERV 13, MERV 15, MERV 16.

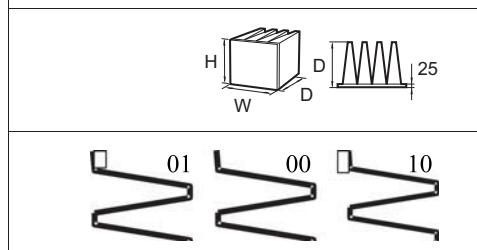
Recommended final pressure drop: 600 Pa.

Temperature: 80°C maximum in continuous service.

N.B: Burst pressure: ≥ 7500 Pa.

Reference	Model	Dimensions (WxHxD) mm	Filter classification EN779:2012	Media area m ²	Air flow/ pressure drop m ³ /h/Pa	Unit weight kg	Unit volume m ³
2472001	Cam GT Box Green II 592*592*315-F7-01	592*592*315	F7	19	4250/140	7.466	0.11
2472004	Cam GT Box Green II 592*592*315-F9-01	592*592*315	F9	19	4250/200	7.709	0.11
2472007	Cam GT Box Green II 592*592*315-E10-01	592*592*315	E10	19	4250/240	7.9	0.11
2472010	Cam GT Box Green II 592*592*315-F7-01 (XL)	592*592*315	F7	25	4250/135	9.575	0.11
2472013	Cam GT Box Green II 592*592*315-F9-01 (XL)	592*592*315	F9	25	4250/190	9.88	0.11
2472016	Cam GT Box Green II 592*592*315-E10-01 (XL)	592*592*315	E10	25	4250/220	10.13	0.11

CamGT 4V-300



Advantages

- Ensures water drainage
- High filtration efficiency
- Low pressure drop also in wet conditions
- Resistant to turbulence and extreme pressure drop
- Easy mounting
- Meets the industry's latest and most stringent requirements
- Water resistant media

Application: All installations where safety/reliability is important.

Type: Compact pleated filter.

Frame: Injection moulded plastic.

Media: Pleated water resistant glass fiber media.

Others: Also available in reverse flow version, half size version and 3/4 size version.

EN779:2012 efficiency: F7, F8, F9.

EN1822:2009 efficiency: E10, E11, E12.

ASHRAE 52.2:1999 filter class: MERV 13, 14, 15, 16.

Recommended final pressure drop: 600 Pa / 2.4"wg. (Recommended final pressure drop for most economical change point is normally lower than 600 Pa)

Temperature: 70° C / 158° F max. operating temperature.

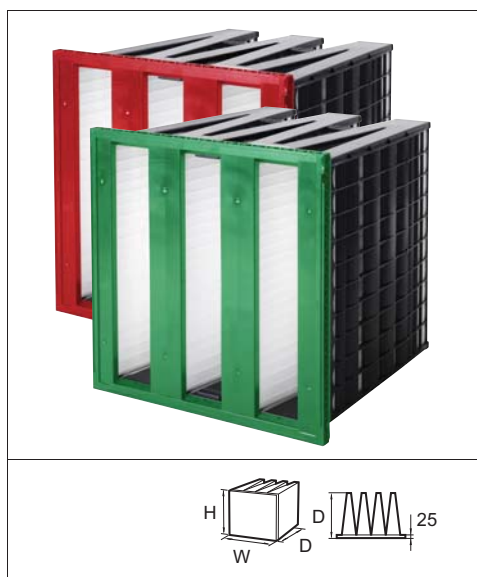
Fire rating: Also available with DIN4102 class b2 rating on request.

Burst strength: >6250 Pa in continuous operation

Model	Width	Height	Depth	Filterclass	AirFlowm³/h	Pressure drop	Mediaaream²	Volyme m³	Weight kg	Initial eff. %	MPPS %	ME %*
4V300	592	592	290	F7	4250	120	19	0,11	8,5	55		55,0
4V300 XL	592	592	290	F7	4250	112	26	0,11	8,5	55		55,0
4V300	592	592	290	F8	4250	130	19	0,11	8,5	70		70,0
4V300 XL	592	592	290	F8	4250	119	26	0,11	8,5	70		70,0
4V300	592	592	290	F9	4250	163	19	0,11	8,5	81		81,0
4V300 XL	592	592	290	F9	4250	152	26	0,11	8,5	81		81,0
4V300	592	592	290	E10	4250	196	29	0,11	8,5		93	
4V300	592	592	290	E11	4250	215	29	0,11	8,5		95,3	
4V300	592	592	290	E12	4250	300	30	0,11	8,5		99,8	

* ME%: Minimum efficiency ref. to EN779:2012

CamGT 3V-600



Advantages

- Lowest air resistance (dP) for optimal economy
- Ensures water drainage
- High filtration efficiency
- Low air resistance also in wet conditions
- Solid HEPA frame eliminates air bypass
- Resistant to high and extreme pressure drops
- Designed for all environments
- Most reliable filter on the market

Application: All installations where safety/reliability is important in combination with low air resistance

Type: Compact pleated filter

Frame: Injection moulded plastic

Media: Pleated water resistant glass fiber media

EN779:2012 efficiency: F8- F9

EN1822:2009 efficiency: E10- E12

ASHRAE 52.2:1999 filter class: MERV 13-16

Recommended final pressure drop: 600 Pa / 2.4"wg (Recommended final pressure drop for most economical change point is normally lower than 600 Pa)

Temperature: 70° C / 158° F max. operating temperature

Others: Other versions on request

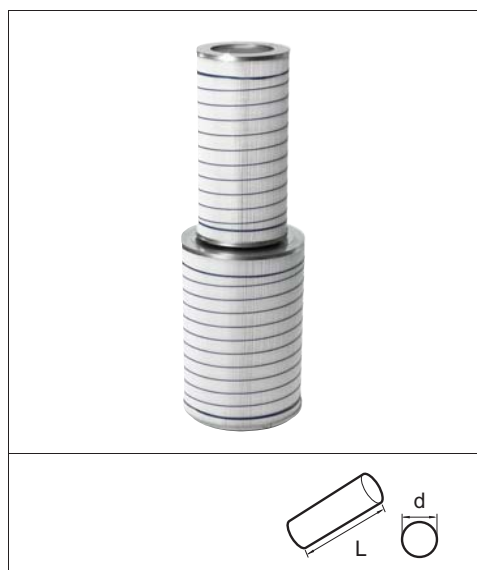
Model	Width	Height	Depth	Filterclass	AirFlowm³/h	Pressure drop	Mediaaream²	Volyme m³	Weight kg	Initial eff. %	MPPS %	ME%*
3V600	592	592	600	F8	4250	100	41	0,22	15,0	67		67
3V600	592	592	600	F9	4250	115	37,8	0,22	15,0	82		82
3V600	592	592	600	E10	4250	135	45,3	0,22	15,0		94,88	
3V600	592	592	600	E11	4250	140	47,8	0,22	15,0		96,95	
3V600	592	592	600	E12	4250	190	(50)	0,22	15,0		>99,5	

* ME%: Minimum efficiency ref. to EN779:2012

* Energy Consumption, kWh/year: Calculated according to Eurovent Guideline 4/11

* Energy class: Calculated according to Eurovent

Campulse GTC



Advantages

- Patented HemiPleat™ technology- proven open pleat solution
- New synthetic media
- Non discharging F9
- Water resistant media
- Improved dust release
- 2 in 1 package - saves space & money for opt. logistics
- Optimal ability to handle daily fog and humidity

Application: For humid/desert/dry/ heavy dust load areas.

Type: Single stage pulse cleaning cartridges.

End caps: Galvanized, stainless steel or powder coated.

Media: Synthetic.

Liners: External helical cords and internal screen secure the filter element from movement without obstruction to the pulse.

Gasket: Continous PU.

Others: Our recommended choice for one-stage self cleaning air intake systems. Also available in other sizes and/or in Tenkay version.

EN779:2012 efficiency: F9.

ASHRAE 52.2.2007 filter class: MERV 16.

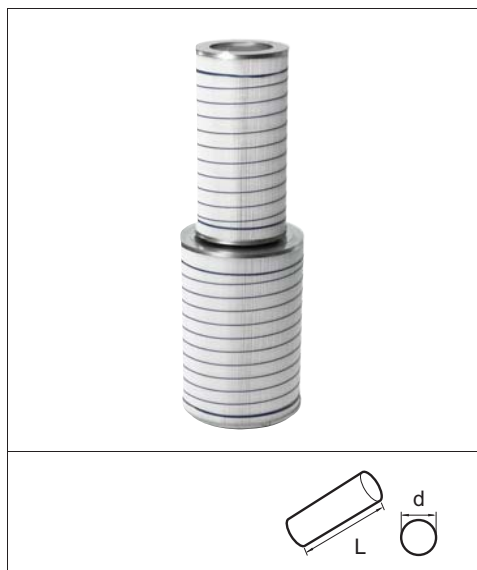
Temperature: 71° C / 160° F max. operating temperature.

Model	Pleat	Length 1	Diameter 1	Length 2	Diameter 2	Filter class	AirFlow m³/h	Pressure drop	Media area m²	Volyme m³	Weight kg	Initialeff. %	ME %*
CyCy*	HemiPleat	660	324	660	445	F9	2500	142	34,7	0,15	12,0	75	74,0
CoCy**	HemiPleat	660	324	660	445	F9	2500	157	34,7	0,15	12,0	75	74,0

* CyCy = Large Cylindrical, Small cylindrical

**CoCY= Large Conical, Small Cylindrical

Campulse GTD



Advantages

- Patented HemiPleat™ technology- proven open pleat solution
- New synthetic media
- Non discharging F9
- Improved dust release
- Water resistant
- 2 in 1 package - saves space & money for opt. logistics

Application: For desert/dry/ heavy dust load areas.

Type: Single stage pulse cleaning cartridges.

End caps: Galvanized, stainless steel or powder coated.

Media: Synthetic.

Liners: External helical cords and internal screen secure the filter element from movement without obstruction to the pulse.

Gasket: Continuous PU.

Other: Available in other sizes on request, also available in Tenkay design.

EN779:2012 efficiency: F9.

ASHRAE 52.2.2007 filter class: MERV 16.

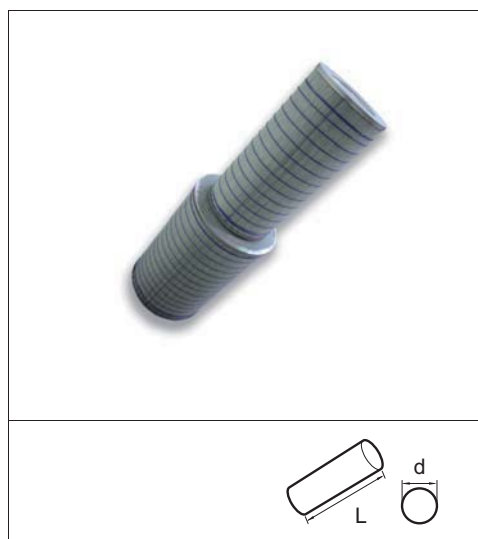
Other: Tested according to ARAMCO spec. 32-SAMSS-008.

Temperature: 71° C / 160° F max. operating temperature.

Model	Pleat	Length 1	Diameter 1	Length 2	Diameter 2	Filter class	AirFlow m³/h	Pressure drop	Media area m²	Volume m³	Weight kg	Initialeff. %	ME %*
CyCy	HemiPleat	660	324	660	445	F9	2500	160	34,7	0,15	13,0	88	75,0
CoCy	HemiPleat	660	324	660	445	F9	2500	175	34,7	0,15	13,0	88	75,0

* CyCy = Large Cylindrical, Small cylindrical
 **CoCY= Large Conical, Small Cylindrical

CamPulse GT Polytech HE



Advantages

- Patented HemiPleat™ technology- proven open
- Water repellent media protected by metal liners
- Each filter set is shipped together in one carton
- Galvanized metal finish
- Self-cleaning air filter cartridges
- Improved air distribution
- Suitable also in high humidity conditions
- Suitable as prefilter for filter class E10, E12
- Increased air to cloth ratio thanks to Hemi-Pleat™ technology.

Application: For desert/dry/ heavy dust load areas.

Type: Single stage pulse cleaning cartridges.

Caps: Galvanized steel, optional material.

Media: PolyTech HE (alt. PolyTech M6).

EN779:2012 efficiency: F7, Average efficiency 0,4 µm = > 95%.

ASHRAE 52.2.2007 filter class: MERV 16.

Temperature: 70° C / 158° F max. operating temperature.

Model	Pleat	Length 1	Diameter 1	Length 2	Diameter 2	Filter class	AirFlow m³/h	Pressure drop	Media area m²	Volyme m³	Weight kg	Initialeff. %	ME %*
CyCy	HemiPleat	660	324	660	445	F7	2500	140	34,7	0,15	12,8	94	35,0
CoCy	HemiPleat	660	324	660	445	F7	2500	165	34,7	0,24	12,8	94	35,0

* CyCy = Large Cylindrical, Small cylindrical
 **CoCy= Large Conical, Small Cylindrical

Tenkay GTC/GTD/PolyTech HE



Advantages

- Self-cleaning air filter cartridges
- State-of-the art pleat spacing
- Galvanized metal finish
- Water repellent media protected by metal liners
- Improved air distribution
- Available in 4 different media grades
- Suitable also in high humidity conditions

Application: For desert/dry/ heavy dust load areas

Type: Single stage pulse cleaning cartridges

Caps: Galvanized steel, optional material

Media: PolyTech HE.

EN779:2012 efficiency: F9

ASHRAE 52.2.2007 filter class: MERV 16

Temperature: 71° C / 160° F max. operating temperature

Type	Model	Pleat	Width	Height	Depth	Filter class	Air Flow	Pressure drop	Media area	Volume	Weight	Initial	ME
Tenkay GTC	Standard 34"	HemiPleat	362	864	406	F9	1150	115	16,5	0,14	8,6	75	74
Tenkay GTC	GoldCone 34"	Hemipleat	362	864	406	F9	1150	160	22,7	0,14	9,5	75	74
Tenkay GTD	Standard 34"	HemiPleat	362	864	406	F9	1150	145	16,5	0,14	8,6	88	75
Tenkay GTD	GoldCone 34"	HemiPleat	362	864	406	F9	1150	180	22,7	0,15	9,5	88	75
Tenkay PolyTech HE	Standard 34"	HemiPleat	362	864	406	F7	1150	147	16,5	0,14	8,6	94	35
Tenkay PolyTech HE	GoldCone 34"	HemiPleat	362	864	406	F7	1150	182	22,7	0,14	9,5	94	35

* ME%: Minimum efficiency ref. to EN779:2012
 * Energy Consumption, kWh/year: Calculated according to Eurovent Guideline 4/11
 * Energy class: Calculated according to Eurovent

CamCleaner 300



Advantages

- Healthier employees
- Less cleaning
- Lower energy costs
- Reduced environmental impact
- Clean products, fewer operational disruptions

Applications: Air purifiers for all types of indoor environments, for example small offices or bedrooms. Can also be used to complement larger air purifiers.

Power supply: 230 V

Filter: E11 and carbon filter

Installation: Floor or wall

Design: Stainless steel

Last update: 2013-03-13

Item no.	Type	Dimensions (WxHxD) mm	Transport dimensions (WxHxD)mm	Weight kg	Filter included in standard version *
501555	CamCleaner 300 Stainless steel	280x665x210	285x670x215	11	E11/carbon mat

* Other filter classes available on request

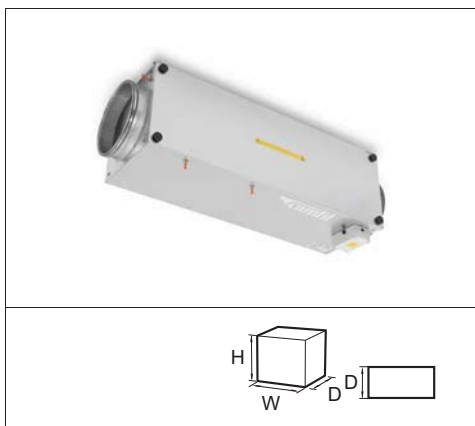
Exchange

Item no.	Type	Model	Dimensions (BxHxD) mm	Filter class compliant with EN1822	Number of filters per air purifier	Comments
204213	Carbon mat filter	Carbon	KFM (253x175x20)	carbon	1	Standard
308007	Main filter	Micretain	PL50EAL (280x195x77-00)	E11	2	Standard
027112	UK plug 230V	UK 50Hz				

* Other filter classes available on request

Air flow m³/h	Energy consumption/W	Noise level dBa	Air purification area m²	System efficiency 0,3-0,4µm (%)
82	42	31	30	>95
119	49	35	50	>95
280	82	41	100	>95

CamCleaner 300 Concealed



Advantages

- Healthier employees
- Less cleaning
- Lower energy costs
- Reduced environmental impact
- Clean products, fewer operational disruptions
- Easy to adapt ducts and diffusers
- AMC filtration

Applications: Air purifier for rooms measuring up to 100 m², for example small or medium offices. Can also be used to complement larger air purifiers.

Nominal voltage range: 200..240V

Filter: F7 and E11

Duct Connection: 2 pc Ø250mm

Capacity: Standard 316 m³/h

Installation: Wall or ceiling (built in)

Design: Galvanized sheet steel

Last update: 2013-05-23

Item no.	Type	Dimensions (WxHxD) mm	Weight kg	Air volume m ³ /h	Initial pressure drop Pa	Air purification area m ²	Power output W	Filter included in standard version *
940000011	CamCleaner 300 Concealed	1052X316X364	21,4	316	137	max 100	28	F7+E11

Upgrades / Accessories / Exchange

Art. Nr	Description
Upgrades	
940000012	Upgrade with standard MiniCarb (CEX003) and 97mm Ecopleat
940000013	Upgrade with MiniCarb for Formaldehyde (CEX004/J2) and 97 mm Ecopleat
940000014	Upgrade to H13
Accessories	
940000015	UK plug
Exchange	
	HI-FLO XLT 7 D50+ HFGX-F7-287/287/370-5-25
	MICRETAIN TRE 11-287X287X292-01
	ECOPLEAT ECO 3GPF 287X287X97-M5
	MEGAFLO MFE 13-287X287X292-01/10
	MINICARB MINICARB/CEX003/A1 d=90/80 mm L=250
	MINICARB MINICARB/CEX004/J2 d=90/80 mm L=250

CamCleaner 800



Advantages

- Healthier employees
- Less cleaning
- Lower energy costs
- Reduced environmental impact
- Clean products, fewer operational disruptions

Applications: Air purifiers for all types of indoor environments for example offices, homes, schools, public environments and where high quality air purification is required. Can be connected to outdoor air.

Power supply: 1 phase, 200..240V

Filter: E11 and Molecular filter mat.

Installation: Mobile or stationary.

Design: Stainless steel

Last update: 2014-01-21

Item no.	Type	Dimensions (WxHxD) mm	Transport dimensions (WxHxD)mm	Weight kg	Filter included in standard version *
94000022	CamCleaner 800 Stainless steel	550x638x263	655x665x365	20	E11/carbon mat
* Other filter classes available on request					

Upgrade/Accessories/Exchange

Item no.	Item name	Filter class compliant with EN1822	Number per air purifier	Comments
Upgrades				
94000023	Hepa 13 (Includes 2 pcs H13 filter)	H13		
Accessories				
94000024	Molecular box with 3 pcs Camcarb G 2600 CEX 003 PELLET	CEX003	1	
94000025	Suction side (outdoor connection)		1	
94000015	UK plug 230V, UK 50Hz		1	
Exchanges				
	Main filter Micretain MXEM 11-252x610x150-00	E11	2	Standard
	Main filter Absolute MXE 13-252X610X150-00	H13	2	
	Molecular filter mat KFM (575x245x25)		1	Standard
	Camcarb G 2600 CEX 003 PELLET	CEX003	3	
* Other filter classes available on request				

Air flow m³/h	Energy consumption /W	Noise level dBA	Air purification area m²	sfp/m3/s	System efficiency 0,3-0,4µm (%)
250	7,97	30	100	0,115	>95
347	5,8	40	140	0,164	>95
520	40,1	47	200	0,277	>95
800	124	56	300	0,557	>95

CamCleaner 2000



Advantages

- Healthier employees
- Less cleaning
- Eliminates tobacco smoke, weld smoke, construction dust, asbestos and particles of all sizes down to ultrafine.
- Reduced environmental impact
- Clean products, fewer operational disruptions
- Lower energy costs

Applications: Air purifier for dusty environments and indoor premises such as warehouses, pharmaceutical facilities, food factories, heavy industry, paper mills, welding workshops, construction sites, laundries, timber facilities, bakeries, packaging production, printing facilities, stables, processing industry and supermarkets. Also suitable in connection with construction, demolition and coating operations.

Power supply: 1 phase, 200..240V

Filter: F7, E11

Connection: 2 standard spacers, diameter 160 mm

Installation: Mobile, stationary or on wall or floor

Please note: Molecular filtration option is available

Design: Stainless steel Body

Last update 2013-08-21

Item no.	Type	Dimensions (WxHxD) mm	Weight kg, including filter	Filter included in standard version *	Number of filters per airpurifier
94000018	CamCleaner 2000 Handle	702x987x373	43	F7/E11	2 Pre + 2 Main
94000019	CamCleaner 2000 Basic	550x783x302	32	E11	2 Pre + 2 Main

* Other filter classes available on request

Upgrades/Accessories/Exchange

Item no.	Item Name	Filter class compliant with EN1822 / EN779:2012	Numbers per air purifier	Comments
Upgrades				
94000020	Extension frame with 1 pc Hepa H13 on supply side	H13		
94000028	Hepa 13 (includes 2 pcs H13 filter)	H13		
Accessories				
94000021	Molecular box with 6 pcs CamCarb G 2600	CEX003	1	
94000029	Suction side		1-2	
94000015	UK plug 230V, UK 50Hz			
Exchange				
	Prefilter Ecopleat G 3GPF (753x250x90-F7)	F7	2	Standard
	Main filter Micretain MXEM E11 (250x750x150-00)	E11	2	Standard
	Main filter Absolute MXE H13 (250x750x150-00)	H13	2	
	Absolute MXE H13 for extension frame on supply side 390x750x250	H13	1	
	Camcarb G 2600 CEX 003 PELLETS	CEX003	6	

* Other filter classes available on request

Air flow m³/h	Energy consumption/W	Noise level dBA	Air purification area m²	sfp/m3/s	System efficiency 0,3-0,4µm (%)
0-1400	0-302	0-68	max 600	0-1,356	>95

CamCleaner 6000



Advantages

- Healthier employees
- Less cleaning
- Eliminates tobacco smoke, weld smoke, construction dust, asbestos and particles of all sizes down to ultrafine.
- Lower energy costs
- Reduced environmental impact
- Clean products, fewer operational disruptions
- Reduces the average temperature in rooms with high ceilings

Applications: Air purifier for dusty environments and large indoor premises such as pharmaceutical facilities, food factories, heavy industry, paper mills, welding workshops, timber facilities, bakeries, packaging production, printing facilities, stables, processing industry, supermarkets and other specialist applications such as upgrading of clean room environments and other classified assembly environments.

Power supply: 3-phase 380-480V or 1-phase 230V

Frequency: 50Hz

Filter: F7, E11-H13

Fan: Ec fan with adjustable rotation speed and pressure

Capacity: 0 - 6000 m³/h

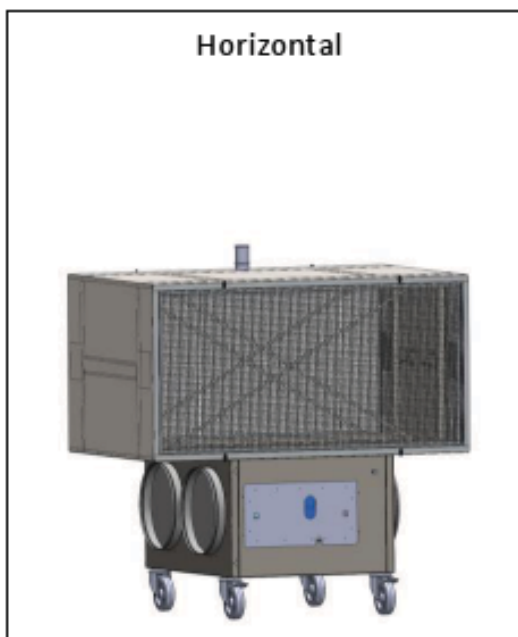
Connection: 4 standard round (diameter 315mm) or 2 standard round (diameter 315mm) and 2 round (diameter 250mm) with sound reduction

Installation: Mobile or stationary, floor, wall or ceiling mounting (with wire or suspension arms). Can be used with Camfil's filter cabinet.

Weight kg: 130,5 including filters

Last update: 2013-03-13

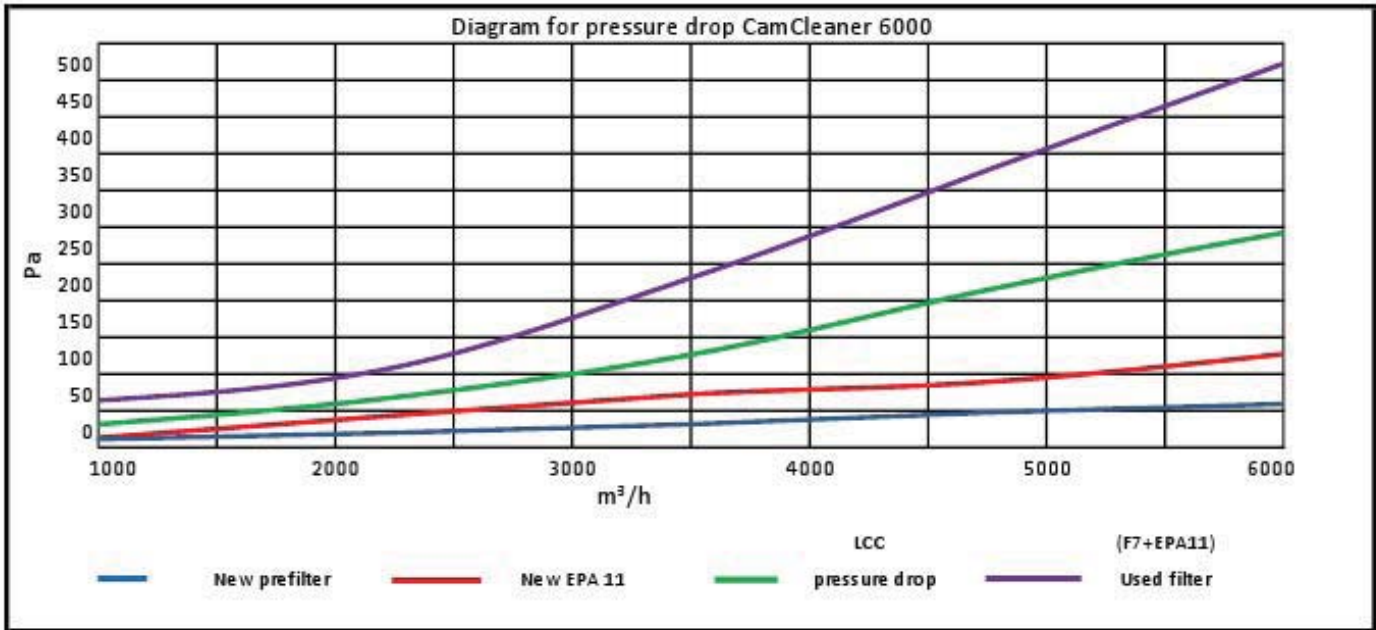
Item no.	Type	Model	Dimension (WxHxD) mm	Filter class compliant with EN1822 / EN779:2012	Number of filters per air purifier
94000001	CamCleaner 6000 230V, 1 phase	Vertical	798x1968x820	F7-E11	4 Pre + 2 Main
94000002	CamCleaner 6000 380-400V, 3 phase	Vertical	798x1968x820	F7-E11	4 Pre + 2 Main
94000003	CamCleaner 6000 230V, 1 phase	Horizontal	1262x1359x829	F7-E11	4 Pre + 2 Main
94000004	CamCleaner 6000 380-400V, 3 phase	Horizontal	1262x1359x829	F7-E11	4 Pre + 2 Main



Air Purifiers

Technical information and pressuredrop

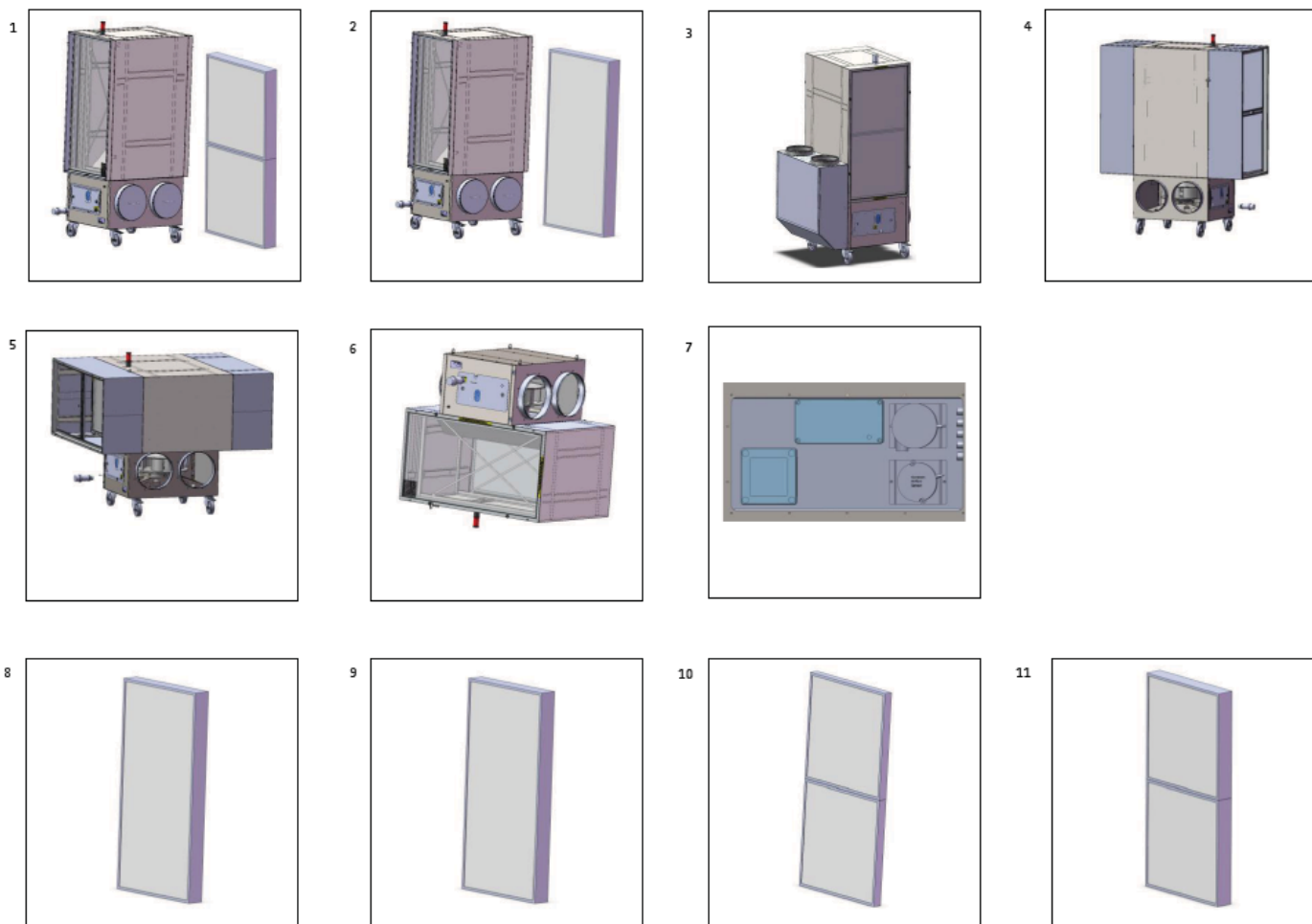
Airflow m ³ /h	Energy Consumption		dBa	m ²	System efficiency(%) Particles	
	SFP	W/(m ³ /h)			0,3-0,5µm	
3000	150W	0,05	52,3	750	99,21	
4000	312W	0,08	55,5	1000	98,93	
5000	556W	0,11	62	1250	98,89	
6000	887W	0,15	67	1500	98,67	



Air Purifiers

Upgrades /Accessories / Exchange

Art. Nr	Item number	Item Name
Upgrades		
94000008	1	Upgrade prefilter to 97mm Ecopleat
94000009	2	Upgrade mainfilter to Hepa 13
Accessories		
94000005	3	Silencer (vertical)
94000010	4-5	Ext. frame for Bagfilter/Citycarb/City-Flo size 592/592/ max 370-10-25 (delivered without filter)
94000006	6	Eyelets for ceiling mounting (Horizontal)
94000007	7	Constant airflow sensor
Exchange		
	8	MGMM 11-1220X610X100-01
	9	MGM 13-1220X610X100-01/10
	10	Ecopleat F7-610X610X50mm
	11	Ecopleat F7-610X610X97mm
Other filter selection		
		Bagfilter XLT F7 592X592-max 380mm
		CityCarb OPKCC-242412-M6-01PU 592x592x292
		City-Flo HFZS-F7-592/592/380-10-25



As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

CamCleaner CITY



Advantages

- Healthier employees
- Less cleaning
- Lower energy costs
- Reduced environmental impact
- Clean products, fewer operational disruptions

Applications: Air purifiers for all types of indoor environments, for example small offices or bedrooms. Can also be used to complement larger air purifiers.

Power supply: 230 V

Filter: E11 and carbon filter

Installation: Floor or wall

Design: Stainless steel

Last update: 2012-04-25

Item no.	Type	Dimensions (WxHxD) mm	Transport dimensions (WxHxD)mm	Weight kg	Filter included in standard version *
501555	CamCleaner 300 Stainless steel	280x665x210	285x670x215	11	E11/carbon mat

* Other filter classes available on request

Exchange

Item no.	Type	Model	Dimensions (BxHxD) mm	Filter class compliant with EN1822	Number of filters per air purifier	Comments
204213	Carbon mat filter	Carbon	KFM (253x175x20)	carbon	1	Standard
308007	Main filter	Micretain	PL502ELM (280x195x80-00)	E11	2	Standard
027112	UK plug 230V	UK 50Hz				

* Other filter classes available on request

Air flow m³/h	Energy consumption/W	Noise level dBA	Air purification area m²	System efficiency 0,3-0,4µm (%)
82	42	31	30	>95
119	49	35	50	>95
280	82	41	100	>95

Dynavane



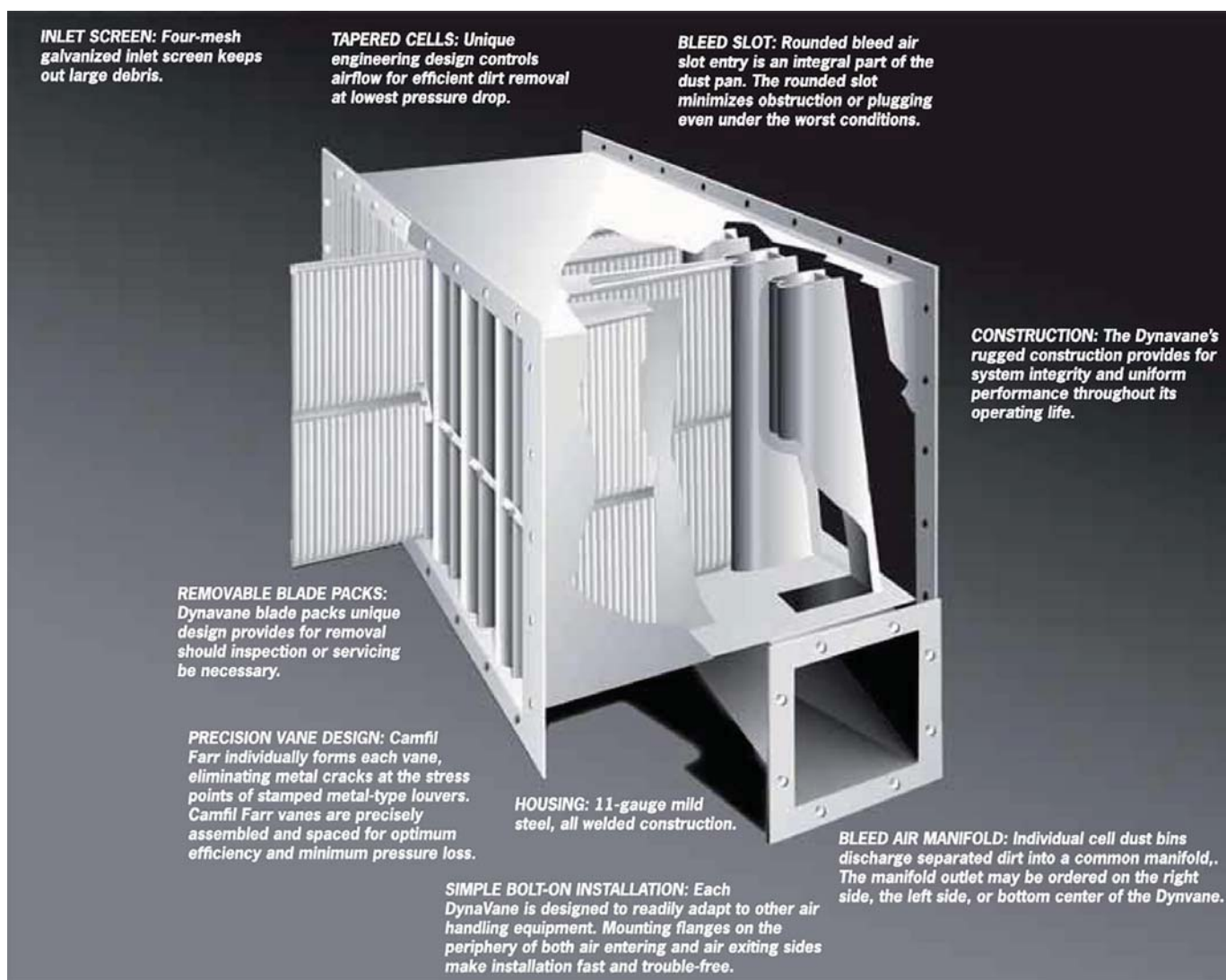
Advantages

- Services large air volume systems at high velocities, separating contaminants through inertial separation
- Constant pressure drop, self-cleaning

Application: High volume HVAC systems in high ambient dust laden applications.

Construction: 11-gauge mild steel mild steel, bolt on flanges for HVAC system connection and bleed outlet, removable blade pack and four mesh inlet screens.

Additional data: Typical bleed air is 10%. Available to service airflows up to a 48,600 cfm.



Gold Series®



Advantages

- Effective industrial air purification solution
- Modular design for optimum flexibility
- Can be customised for Original Equipment Manufacturers (OEM)
- Easy to install and maintain
- Simple cartridge replacement using quick release cam bars
- Footprint typically 25% smaller than competitor products

Application: Farr Gold Series cartridge dust and fume collectors may be used for a wide range of pollution control and product recovery applications including: Blasting, Chemical Processing, Fiberglass and FRP, Food Processing, Laser/Plasma Cutting, Paper Scrap, Rubber Grinding, Seed Processing, Solar Panel Fabrication, Thermal Spray and more.

Type: Pulse cleaning, cartridge based dust collector with high performance filter elements. Cleaning is accomplished by pulse waves that emanate from the centre of the filter providing enhanced cleaning for a more efficient operation.

Construction: Strong modular construction using 4.5mm carbon steel for the frame and 3.4mm carbon steel for the doors, hopper and panels.

Finish: As standard in a green, durable, corrosion resistant powder coated finish. Alternative construction and colours are also available.

Options: A wide variety of options are available including: Explosion Venting, Special Inlet Designs, BIBO (bag in-bag out) for Pharmaceutical Applications, Custom Colours, Stainless Steel Construction, Alternative Hopper Designs etc. please contact us with your specific requirements.

Cartridges: Vertically mounted to shed dust readily for efficient cleaning and longer service life. High filtration efficiency meeting the 5 mg/m³ or less emissions required to re-circulate the air back into the work place on non hazardous dusts.

Features

- Modular design for optimum flexibility—have it your way fast!
- Each module accommodates airflows up to 8,500 m³/h
- Module constructed of 4.5mm thick carbon steel
- Door, hopper, inlet and panels are all 3.4mm thick
- Powder painted for unsurpassed corrosion resistance
- Component configurations are virtually unlimited
- Vertical design of cartridges enables efficient pulse cleaning of dust

Easy Maintenance

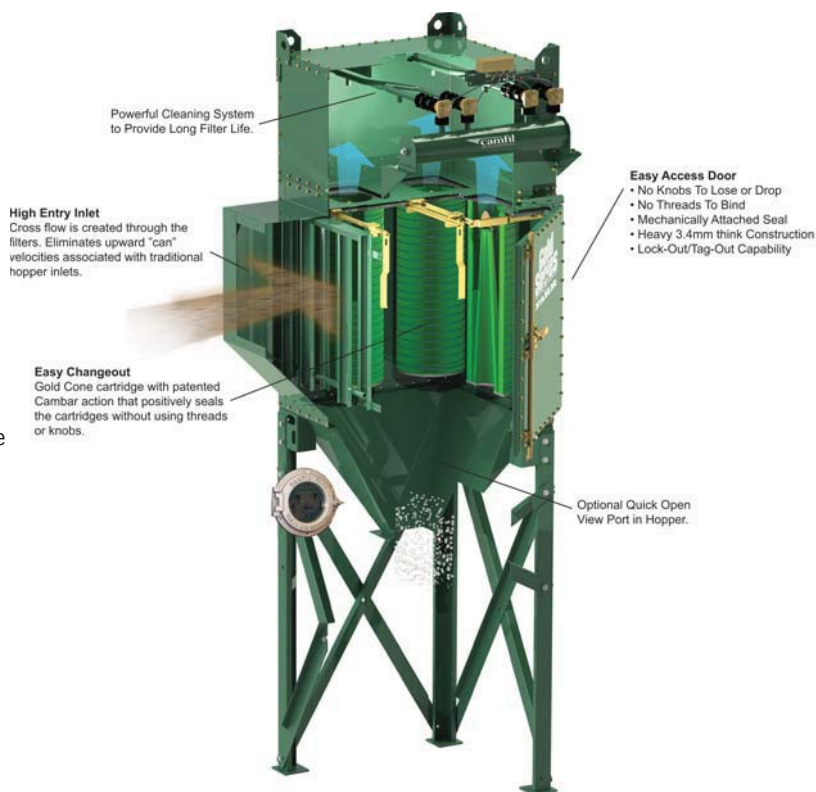
Simple, quick-open heavy gauge door(s) provide access to a super-fast cartridge change-out system that does not require entry into the collector. The door is fully reversible for access from either side and has an exclusive lock-out feature for worker safety.

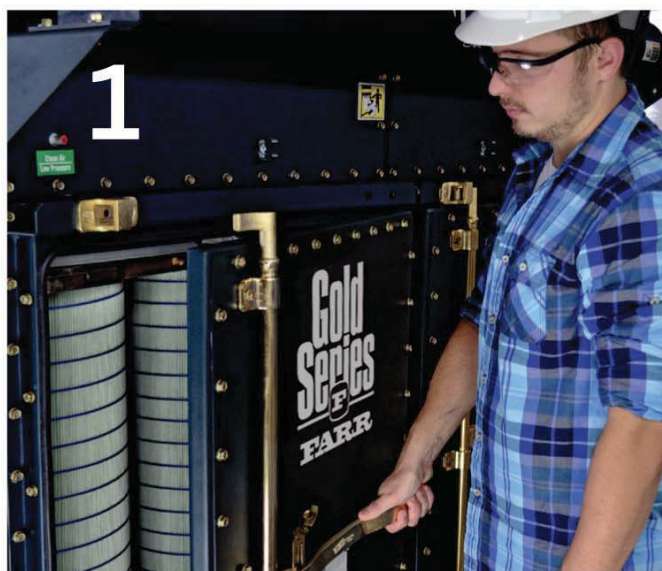
Easy Access Door

- No knobs to lose or drop
- No threads to bind
- Mechanically attached seal
- Heavy 3.4mm thick construction

Easy Change-out

Gold Cone cartridge with patented cambar action that positively seals the cartridges without using threads or knobs.





As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Gold Series® Camtain



Advantages

- Designed specifically for pharmaceutical and containment applications
- Bag-in/bag-out safe change options available.
- High collector efficiency using HemiPleat cartridges
- Modular design for optimum flexibility
- Customised for Original Equipment Manufacturers (OEM)
- Easy to install and maintain
- Simple cartridge replacement using quick release cam bars
- Up to 25% smaller

Application: The Farr Gold Series® Camtain™ is used in a wide range of pharmaceutical applications including tablet presses, coating, fluid bed and spray drying, blending, granulation and general ventilation.

Type: Pulse cleaning, cartridge based dust collector with high performance filter elements. Cleaning is accomplished by pulse waves that emanate from the centre of the filter providing enhanced cleaning for a more efficient operation.

Construction: Strong modular construction using 4.5mm carbon steel for the frame and 3.4mm carbon steel for the doors, hopper and panels.

Finish: As standard for Camtain units in a white, durable, corrosion resistant powder coated finish. Alternative construction and colours are also available.

Options: A wide variety of options are available including: BIBO (bag in-bag out) for Pharmaceutical Applications, Explosion Venting, Special Inlet Designs, Custom Colours, Stainless Steel Construction, Alternative Hopper Designs etc. please contact us with your specific requirements.

Cartridges: Vertically mounted to shed dust readily for efficient cleaning and longer service life. High filtration efficiency meeting the 5 mg/m³ or less emissions required to re-circulate the air back into the work place on non hazardous dusts.



Features

- Safe-change containment systems are available for both the filter cartridges and discharge system underneath the collector.
- The cartridge change utilizes the safe change filter replacement method while the discharge uses continuous liner technology.
- The Farr Gold Series Camtain is perfect for high efficiency filtration in pharmaceutical manufacturing processes where recovery of the product is not required.
- The only dust collector that is potent compound surrogate tested for validated performance verification. Test report available upon request.



Surrogate tested bag-in/bag-out safe change option available.



As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Zephyr III Portables



Advantages

- Portable air purification system
- Ideal for industrial process contamination, source capture, and for plants requiring periodic dust collection at various locations.
- Portable
- The only thing you need to supply is the electrical feed and compressed air line.
- Complete unit– plug it in and start collecting dust and fumes.

Application: The Zephyr is a portable air cleaner for capturing welding fumes, grinding dusts, dry dusts, and soldering fumes, and other airborne particles. Not suitable for explosive dusts & solvent fumes.

Features

- Roll out dust drawer.
- Quick clamp cartridge sealing/removal.
- Exterior arm adjustments.
- Heavy duty fume arm is obstruction free inside.
- Easy, 360° hood positioning.
- 1200 m³/h at the capture hood.
- Three stage filtration:
- Primary spark trap
- Gold Cone® HemiPleat®
- Carbon after filter for ozone only
- Large wheels with swivels and brakes for ease in moving and positioning.
- Tough powder coated surface finish inside and outside.
- Venturi assisted pulse cleaning, manually activated.
- Dust drawer grid minimizes dust re-entrainment.
- 110v/ 1ph/ 50 Hz, 1.1 kW motor
- (16 amp circuit required) - UK
- 400v/ 3ph/ 50 Hz, 1.5 kW motor - Europe
- Thermal overload in motor starter switch.
- 7.5 m extension cord.
- The only thing you need to supply is the electrical feed and compressed air line.



HemiPleat® Gold Cone®



Advantages

- Original spare for Farr Gold Series® dust collectors
- Vertically integrated cartridge for better dust release and ease of removal and installation
- Extended Filter Life
- High Filtration Efficiency
- Pour in place one piece double gasket
- Excellent energy saving performance

Application: Air Pollution Control filter cartridge to collect dust, fumes and/or oil mist in many different industrial applications and processes

Execution: Please refer to extended HemiPleat Gold Cone data sheet

Media: PolyTech™ - HemiPleat Green

Media: PolyTech™ - HemiPleat Fire Retardant

Media: PolyTech™ - HemiPleat Carbon

Media: PolyTech™ - HemiPleat eXtreme Green

Media: PolyTech™ - HemiPleat eXtreme Fire Retardant

Media: PolyTech™ - HemiPleat eXtreme Carbon

Media: PolyTech™ - HemiPleat Synthetic

Media: PolyTech™ - HemiPleat eXtreme Synthetic

Media: PolyTech™ - HemiPleat Hi-Efficiency

Media: PolyTech™ - HemiPleat Hi-Efficiency FR

Media: PolyTech™ - HemiPleat Hi-Efficiency Carbon

Gasket: Pour-in-place one piece gasket

Separator: HemiPleat Separator Technology

Potting component: Polyurethane

Cage: Internal GV support cage

Efficiency: 99.99% on 0.5 micron and larger particles by weight

Filter Class: M

Temperature / Humidity: 70°C Operating, 82°C Surge

Media Type	P/N	Model Number	Filter Class	Dimensions (DxL) mm	Media area m ²
HemiPleat Green	325325001	GS-GR-325	M	380x1000	30.2
HemiPleat Fire Retardant	325325002	GS-FR-325	M	380x1000	30.2
HemiPleat Carbon	325325003	GS-CB-325	M	380x1000	30.2
HemiPleat eXtreme Green	325325004	GS-XG-325	M	380x1000	30.2
HemiPleat eXtreme Fire Retardant	325325005	GS-XF-325	M	380x1000	30.2
HemiPleat eXtreme Carbon	325325006	GS-XC-325	M	380x1000	30.2
HemiPleat Synthetic	325325007	GS-SY-325	M	380x1000	30.2
HemiPleat eXtreme Synthetic	325325008	GS-XS-325	M	380x1000	30.2
HemiPleat Hi-Efficiency	325325009	GS-HG-325	M	380x1000	30.2
HemiPleat Hi-Efficiency FR	325325010	GS-HF-325	M	380x1000	30.2
HemiPleat Hi-Efficiency Carbon	325325011	GS-HC-325	M	380x1000	30.2

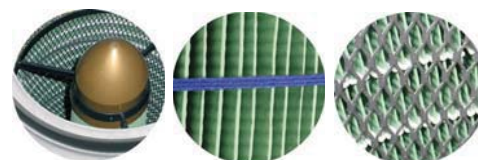
• Featuring an injection molded inner cone in the center of the cartridge, cleaning is accomplished by pulse waves that emanate outward from this inner cone providing enhanced cleaning for more efficient operation, longer cartridge life and reduced service requirements.

• The new PolyTech™ media is the most advanced pulse-cleaned media ever made, and now comes standard with a moisture resistant treatment for high humidity resistance.

• Continuous double seal gaskets give added insurance against leaks. No other filter design gives you a double seal barrier.

• The separation beads, NOT the media beads, contact the inner cage, protecting the media from frictional damage.

• The HemiPleat separator bead opens up the pleats uniformly, allowing more effective cleaning and lower pressure drop.



HemiPleat® Retrofit



Advantages

- Camfil Pleat Separator Technology
- Low Pressure Drop
- Extended Filter Life
- High Filtration Efficiency
- 80/20 PolyTech™ media
- Pour in place one piece gasket
- Broad design portfolio

Application: Air Pollution Control filter cartridge to collect dust, fumes and/or oil mist in many different industrial applications and processes.

Execution: Please refer to HemiPleat Retrofit data sheet.

Media: PolyTech™ - Hemipleat (Green FR, Carbon, Synthetic - Also available with eXtreme).

Gasket: Urethane pour-in-place one piece gasket.

Separator: HemiPleat Separator Technology.

Potting component: Polyurethane.

Cage: Internal GV support cage.

Efficiency: 99.99% on 0.5 micron and larger particles by weight.

Filter Class: L, M

Temperature / Humidity: Max. 70 °C

Options: Flexible length <1000 mm, flexible top style, stainless steel

Camfil APC Retrofit Cartridges	P/N	Model Number	Filter Class	Dimensions (ODxDxDL) mm	Media area m ²
AAF Optiflo Series 352mm OD x 241mm ID x 711mm L Open Top and Bottom, Internal Metal Cage External Helical Cord Wrap	211606001	HMPOPF-167-GR	M	352x241x711	15.5
	211606002	HMPOPF-167-CB	M	352x241x711	15.5
	211606003	HMPOPF-167-FR	M	352x241x711	15.5
	211606004	HMPOPF-167-HG	M	352x241x711	15.5
	211606005	HMPOPF-167-HF	M	352x241x711	15.5
	211606006	HMPOPF-167-XF	M	352x241x711	15.5
	211606007	HMPOPF-167-XG	M	352x241x711	15.5
	211606009	HMPOPF-167-SY	M	352x241x711	15.5
	211606010	HMPOPF-167-XS	M	352x241x711	15.5
	211606011	HMPOPF-167-HC	M	352x241x711	15.5
	211606012	HMPOPF-167-XC	M	352x241x711	15.5
Torit Downflo & UAS (FJH/FJS) Series 324mm OD x 213mm ID x 660mm L Open Top and Bottom, Internal Metal Cage External Helical Cord	211985001	HMPTB1-135	M	324x213x660	12.5
	211985002	HMPTBCB-135	M	324x213x660	12.5
	211985003	HMPTBFP-135	M	324x213x660	12.5
	211985004	HMPTBHG-135	M	324x213x660	12.5
	211985005	HMPTBHF-135	M	324x213x660	12.5
	211985006	HMPTBXF-135	M	324x213x660	12.5
	211985007	HMPTBXG-135	M	324x213x660	12.5
	211985009	HMPTBSY-135	M	324x213x660	12.5
	211985010	HMPTBXS-135	M	324x213x660	12.5
	211985011	HMPTBHC-135	M	324x213x660	12.5
	211985012	HMPTBXC-135	M	324x213x660	12.5

Air Pollution Control - Dust collectors and filters

Camfil APC Retrofit Cartridges	P/N	Model Number	Filter Class	Dimensions (ODxDxDL) mm	Media area m ²
Torit Downflo II & MAC Mac2flo Series 352mm OD x 241mm ID x 660mm L Open Top and Bottom, Internal Metal Cage External Helical Cord Wrap	210823001	HMPDF2SOP-154	M	352x241x660	14.0
	210823002	HMPDF2COP-154	M	352x241x660	14.0
	210823003	HMPDF2FOP-154	M	352x241x660	14.0
	210823004	HMPDF2HGOP-154	M	352x241x660	14.0
	210823005	HMPDF2HFOP-154	M	352x241x660	14.0
	210823006	HMPDF2XFOP-154	M	352x241x660	14.0
	210823007	HMPDF2XGOP-154	M	352x241x660	14.0
	210823009	HMPDF2SYOP-154	M	352x241x660	14.0
	210823010	HMPDF2XSOP-154	M	352x241x660	14.0
	210823011	HMPDF2HCOP-154	M	352x241x660	14.0
	210823012	HMPDF2XCOP-154	M	352x241x660	14.0
Torit TD Large Series 324mm OD x 213mm ID x 660mm L Open Top, Closed Bottom w/14mm Dia Hole Internal Metal Cage, External Helical Cord	211831001	HMPTA1-135	M	324x213x660	12.5
	211831002	HMPTACB-135	M	324x213x660	12.5
	211831003	HMPTAFP-135	M	324x213x660	12.5
	211831004	HMPTAHG-135	M	324x213x660	12.5
	211831005	HMPTAHF-135	M	324x213x660	12.5
	211831006	HMPTAXF-135	M	324x213x660	12.5
	211831007	HMPTAXG-135	M	324x213x660	12.5
	211831009	HMPTASY-135	M	324x213x660	12.5
	211831010	HMPTAXS-135	M	324x213x660	12.5
	211831011	HMPTAHC-135	M	324x213x660	12.5
	211831012	HMPTAXC-135	M	324x213x660	12.5
Torit TD Small Series 201mm OD x 91mm ID x 406mm L Open Top, Closed Bottom w/ 0.68" Dia. Hole Internal Metal Cage, External Helical Cord Wrap	213079001	HMPTA18-36	M	201x91x406	3.0
	213079002	HMPTACB8-36	M	201x91x406	3.0
	213079003	HMPTAFP8-36	M	201x91x406	3.0
	213079004	HMPTAHG8-36	M	201x91x406	3.0
	213079005	HMPTAHF8-36	M	201x91x406	3.0
	213079006	HMPTAXF8-36	M	201x91x406	3.0
	213079007	HMPTAXG8-36	M	201x91x406	3.0
	213079009	HMPTASY8-36	M	201x91x406	3.0
	213079010	HMPTAXS8-36	M	201x91x406	3.0
	213079011	HMPTAHC8-36	M	201x91x406	3.0
	213079012	HMPTAXC8-36	M	201x91x406	3.0
UAS (FJL) Series 324mm OD x 213mm ID x 762mm L Open Top and Bottom, Internal Metal Cage External Helical Cord Wrap	211989001	HMPTB130-156	M	324x213x762	14.5
	211989002	HMPTBCB30-156	M	324x213x762	14.5
	211989003	HMPTBFP30-156	M	324x213x762	14.5
	211989004	HMPTBU30-156	M	324x213x762	14.5
	211989005	HMPTBUF30-156	M	324x213x762	14.5
	211989006	HMPTBXFR30-156	M	324x213x762	14.5
	211989007	HMPTBXST30-156	M	324x213x762	14.5
	211989009	HMPTBSY30-156	M	324x213x762	14.5
	211898010	HMPTBXS30-156	M	324x213x762	14.5
	211989011	HMPTBHC30-156	M	324x213x762	14.5
	211989012	HMPTBXC30-156	M	324x213x762	14.5

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

Air Pollution Control - Dust collectors and filters

Camfil APC Retrofit Cartridges	P/N	Model Number	Filter Class	Dimensions (ODxIDxL) mm	Media area m ²
UAS (SBS/SBD) Series 381mm OD x 254mm ID x 711mm L Open Top and Bottom, Internal Metal Cage External Helical Cord Wrap	213359001	HMPASN15-182-28	M	381x254x711	17.0
	213359002	HMPASNCB15-182-28	M	381x254x711	17.0
	213359003	HMPASNFP15-182-28	M	381x254x711	17.0
	213359004	HMPASNU15-182-28	M	381x254x711	17.0
	213359005	HMPASNUF15-182-28	M	381x254x711	17.0
	213359006	HMPASNFR15-182-28	M	381x254x711	17.0
	213359007	HMPASNST15-182-28	M	381x254x711	17.0
	213359009	HMPASNSY15-182-28	M	381x254x711	17.0
	213359010	HMPASNXS15-182-28	M	381x254x711	17.0
	213359011	HMPASNHC15-182-28	M	381x254x711	17.0
	213359012	HMPASNXC15-182-28	M	381x254x711	17.0
Wheelabrator 26" WCC Series 324mm OD x 213mm ID x 660mm L Open Top with Mounting Plate, Closed Bottom Internal Metal Cage, External Helical Cord Wrap	213613001	HMPWB26-135-MP	M	324x213x660	12.5
	213613002	HMPWB26C-135-MP	M	324x213x660	12.5
	213613003	HMPWB26F-135-MP	M	324x213x660	12.5
	213613004	HMPWB26HG-135-MP	M	324x213x660	12.5
	213613005	HMPWB26HF-135-MP	M	324x213x660	12.5
	213613006	HMPWB26XF-135-MP	M	324x213x660	12.5
	213613007	HMPWB26XG-135-MP	M	324x213x660	12.5
	213613009	HMPWB26SY-135-MP	M	324x213x660	12.5
	213613010	HMPWB26XS-135-MP	M	324x213x660	12.5
	213613011	HMPWB26HC-135-MP	M	324x213x660	12.5
	213613012	HMPWB26XC-135-MP	M	324x213x660	12.5
Wheelabrator 36" WCC Series 324mm OD x 213mm ID x 914mm L Open Top with Mounting Plate, Closed Bottom Internal Metal Cage, External Helical Cord Wrap	213540001	HMPWB35-182-MP	M	324x213x914	17.0
	213540002	HMPWB35C-182-MP	M	324x213x914	17.0
	213540003	HMPWB35F-182-MP	M	324x213x914	17.0
	213540004	HMPWB35HG-182-MP	M	324x213x914	17.0
	213540005	HMPWB35HF-182-MP	M	324x213x914	17.0
	213540006	HMPWB35XF-182-MP	M	324x213x914	17.0
	213540007	HMPWB35XG-182-MP	M	324x213x914	17.0
	213540009	HMPWB35SY-182-MP	M	324x213x914	17.0
	213540010	HMPWB35XS-182-MP	M	324x213x914	17.0
	213540011	HMPWB35HC-182-MP	M	324x213x914	17.0
	213540012	HMPWB35XC-182-MP	M	324x213x914	17.0

• Lower pressure drop through open pleat spacing improves cleaning efficiency, which will reduce energy costs through less compressed air consumption during cleaning in many applications.

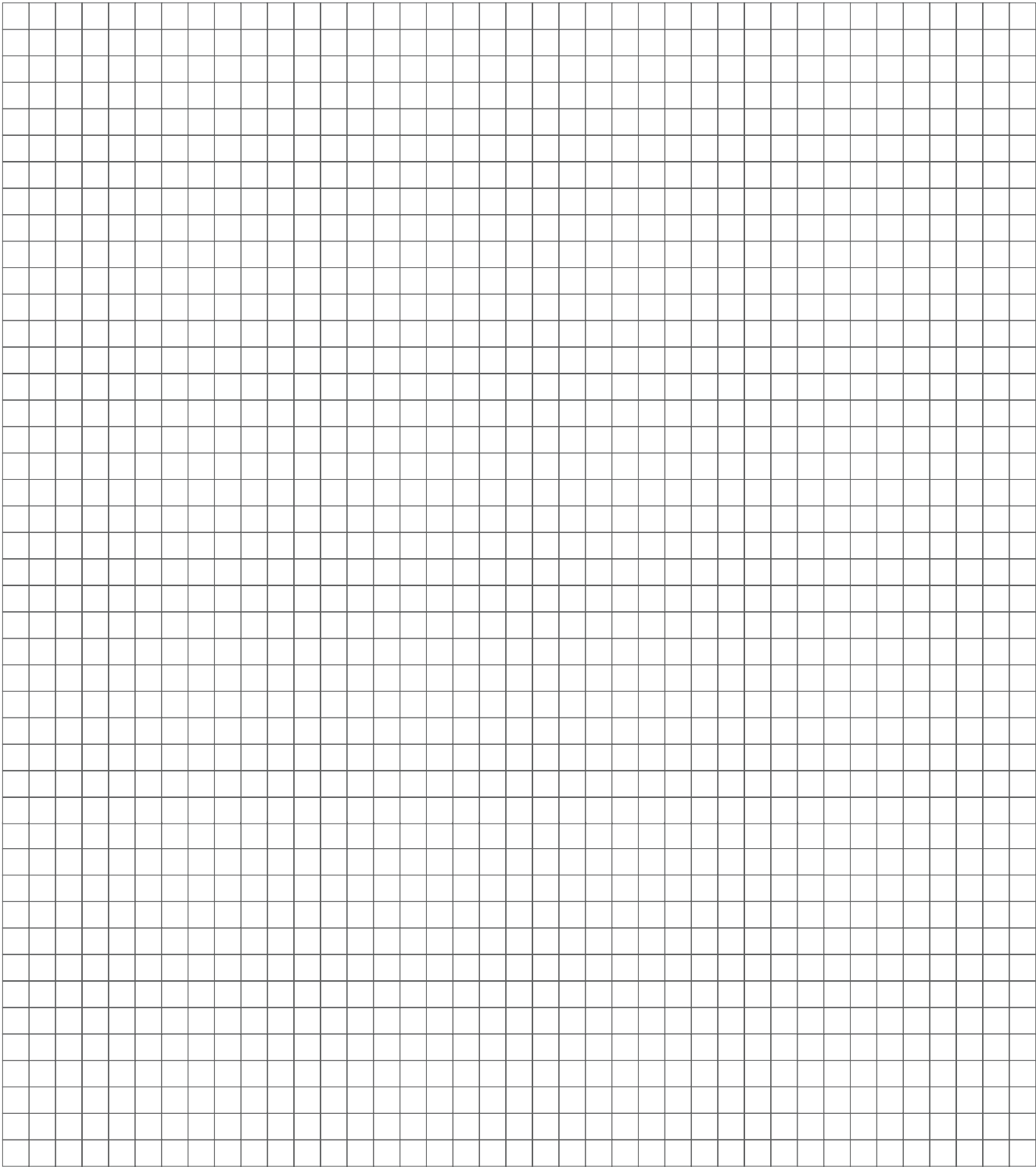
• More media available for filtration and therefore improved performance and longer life time.

• The separation beads, NOT the media beads, contact the inner cage, protecting the media from frictional damage.

• Improve the performance or solve problems such as short filter life with existing collector system. Camfil filter cartridges are made with the new HemiPleat® PolyTech™ media, the most advanced pulse cleaned media ever made. GUARANTEED.

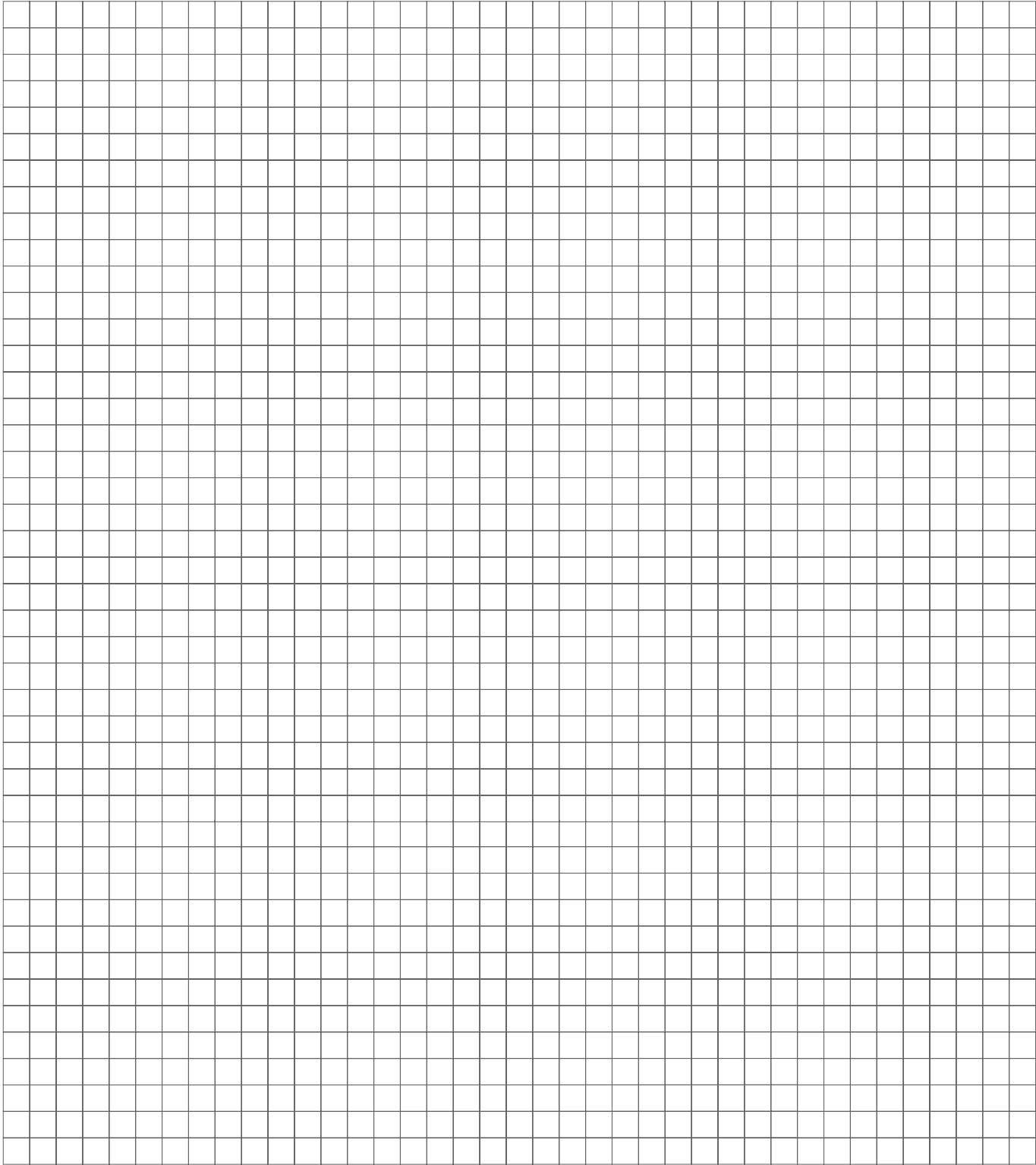
• Camfil offers replacements upgrade cartridges to fit almost ANY cartridge collector.

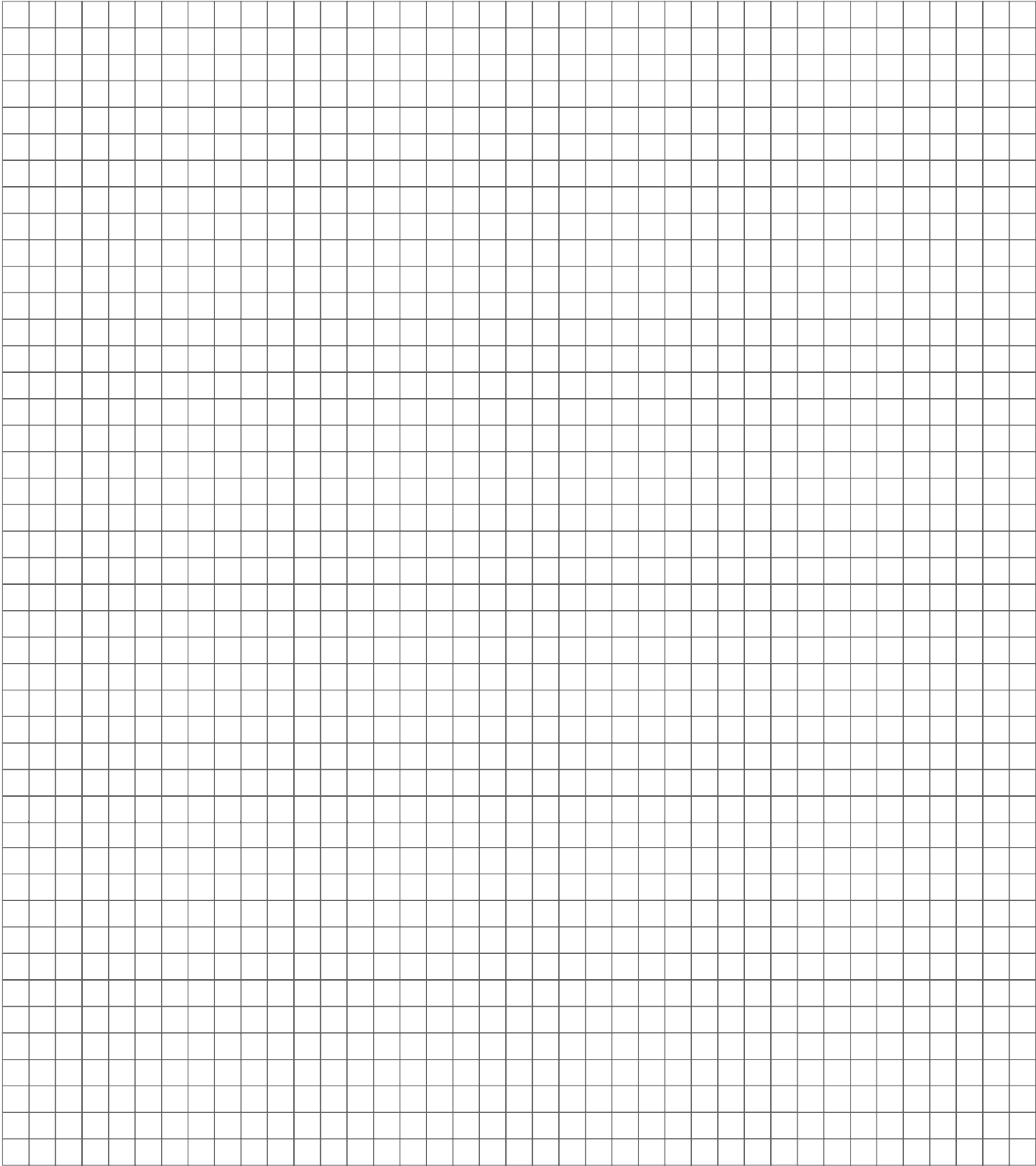




As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

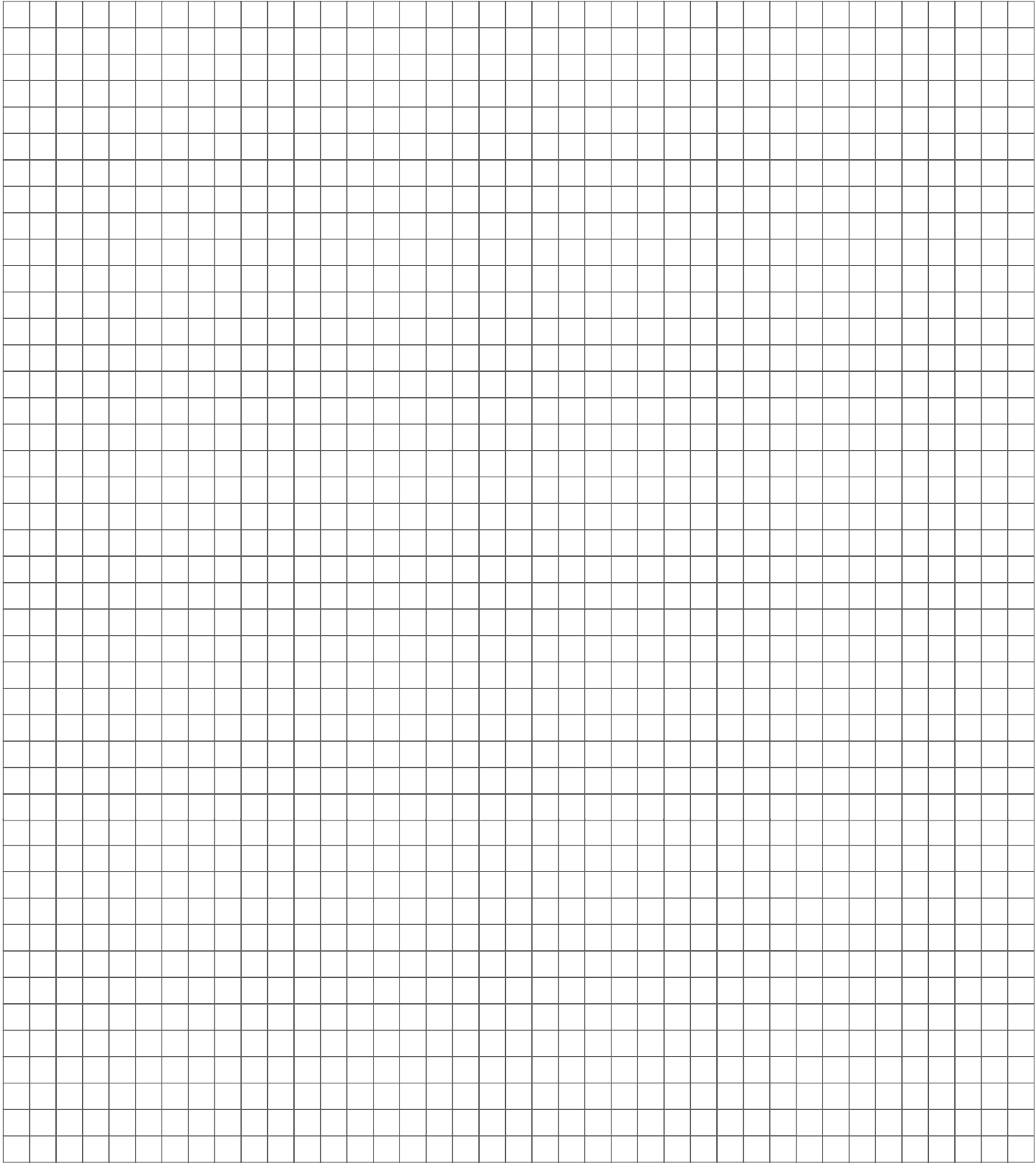
As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

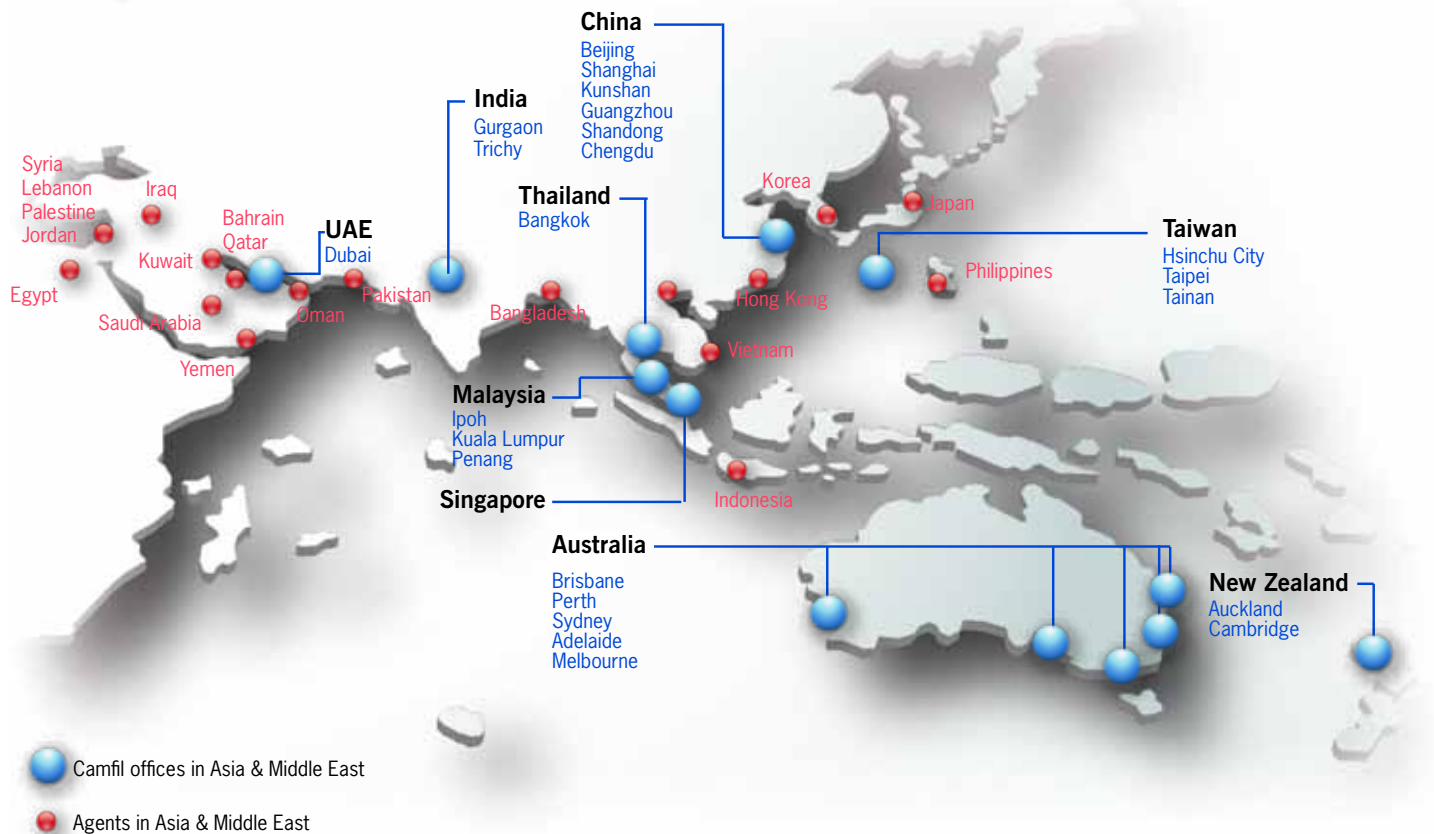




As part of our continuous improvement, Camfil reserve the right to change specifications without notice.

As part of our continuous improvement, Camfil reserve the right to change specifications without notice.





CAMFIL OFFICES IN ASIA-PACIFIC AND MIDDLE EAST

Australia

Sydney Tel: +61 2 9648 5800
Adelaide Tel: +61 8 8346 6797
Brisbane Tel: +61 7 3375 7066
Melbourne Tel: +61 3 9761 7411
Perth Tel: +61 8 9248 2875

China

Kunshan (Plant) Tel: +86 512 57710888
Shanghai Tel: +86 21 5489 0333
Beijing Tel: +86 10 128 0457
Guangzhou Tel: +13 58 056 8790
Shandong Tel: +18 65 312 8332
Chengdu Tel: +13 07 608 0158

India

Gurgaon (Plant) Tel: +91 124 4324 183
Trichy Tel: +91 431 424 6151

Malaysia

Ipoh (Plant) Tel: +605 366 8888
Kuala Lumpur Tel: +603 8023 8250
Penang Tel: +604 642 5004

New Zealand

Auckland Tel: +64 9 636 0663
Cambridge Tel: +64 7 827 4142

Singapore

Singapore Tel: +65 6659 5189

Taiwan

Hsinchu City Tel: +886 3 5353 339
Taipei City Tel: +886 2 2757 6208
Tainan City Tel: +886 6 505 1921

Thailand

Bangkok Tel: +66 2694 1480 4

United Arab Emirates

Dubai Tel: +971 4 887 1796

ASIAN AND MIDDLE EAST DISTRIBUTORS

HONG KONG

JAPAN
KOREA
VIETNAM
PHILIPPINES
INDONESIA
BAHRAIN
BANGLADESH
EGYPT
IRAQ

JORDAN

KUWAIT
LEBANON
OMAN
PALESTINE
PAKISTAN
QATAR
SYRIA
SAUDI ARABIA
YEMEN

For Asia countries represented by agents, please contact our Singapore office.

For Middle East countries represented by agents, please contact our Dubai office.

Printed in 25 Sept 2013
Edition 2014

CAMFIL is the world's largest and leading manufacturer of filters and clean air solutions

There is a good chance that, at this very moment, you are breathing clean air that has passed through a filter manufactured by us. Our products can be found everywhere from offices to clean rooms for sensitive electronics production, mines, factories, hospitals and nuclear power stations. Camfil is a global company with 29 subsidiaries, 22 production plants and an extensive network of agents in Europe, North America and Asia.