



CAMSAFE 2

Safe change filter housing system, for use wherever containment and operator safety is essential.



CAMFIL – MORE THAN A CLEAN AIR SOLUTIONS PROVIDER

Camfil is a world leader in clean air technology and air filter production. Our organization is a specialist in the field of air filtration solutions. We are focused on research and development, state-of-the-art manufacturing, we don't just market them we supply solutions of air filtration products solutions and services on a global basis.

The Camfil group of companies are the world's largest designer and manufacturer of air filters with currently 30 manufacturing facilities and plans to invest in more production units around the globe as our customer base continues to grow. Camfil takes great pride in the fact that our products are of the highest quality, offering our customers air filters with the longest life, and lowest operating and maintenance costs.

For the past 50+ years we have been a leading supplier of air filtration solutions and services to the Life Science and other Industry. Many of our clients have multiple facilities located around the world. Camfil is viewed by many of the largest Life Science manufacturers as a partner as we are well positioned to support their air filtration demands on a local and global basis. Major investments have been made in our R&D departments located around the world to develop products specifically for the Life Science industry. It is common for us to 'partner' with our customers and their consultants or contractors to meet and often exceed their most demanding air filtration requirements.

CAMFIL REACH OVER EUROPE

EUROPEAN OFFICES

- | | |
|----------|-------------|
| Austria | Netherlands |
| Belgium | Norway |
| Bulgaria | Poland |
| Denmark | Romania |
| Finland | Slovakia |
| France | Spain |
| Germany | Sweden |
| Hungary | Switzerland |
| Iceland | Turkey |
| Ireland | UK |
| Italy | Russia |

MIDDLE EAST OFFICE

- United Arab Emirates

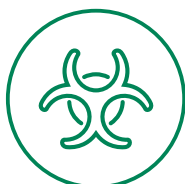


SEGMENT FOCUS

In many of our chosen market segments we have Subject Matter Experts (SME's) in all major geographic regions in order to support our customers needs. Camfil's global network of Segment managers are fully aligned internally and externally. Our role is to ensure we communicate the latest technology to meet or exceed the application requirements to the most current local, regional and international standards. The Camfil safe change filter housing system, CamSafe 2, is for use wherever containment and operator safety is essential.

Field of application:

- Biosafety
- Safety laboratories
- Pharmaceutical
- Animal facilities
- Biotech
- Industries (chemical)
- Hospital



Mechanical resistance

- (EN 1886:2003), Classified: class D1

Local and global leak tests

- EUROVENT 2/2, classified class C
- EN 1886, classified class L1
- ISO 10648, classified class 3
- EN 12237, classified class D

Penetration between filter and support frame ISO 14644-3
At the nominal air-flow with an Camfil ABSOLUTE H14 filter at its final pressure drop the penetration is lower than the 0,01% admissible.

Particulate containment capacity tested

- According to EN 689:1996

As mentioned in ISPE Good Practice by SMEPAC Committee and independantly tested. Camsafe 2 ensures the particulate containment performance (CPT 1,795 µg/m3) for Pharmaceutical equipment during HEPA filter replacement.



CAMSAFE 2 WITH UNIQUE FEATURES

We would like to present 12 unique features demonstrating that our development, in partnership with some intensive users, **Safety, Performance and User Friendliness** are the cornerstone of the CamSafe 2 development. Learn more about the unique features developed for the CamSafe 2.

① RELIABLE

A: TIGHTNESS

Perfect permanent tightness continuous welded.
Pressure tested +/- 6000 Pa.

B: DIN GASKET

Leak tight test device can be used to test all HEPA/ULPA filter cells for perfect seal placement in the housing, even during operation.

C: GLASS WINDOW

Visual security using the Window. You don't have to open the door to check if there is a filter in the CamSafe 2. Just look through the inspection window. This feature helps you avoid the risk of contamination due to not having a filter installed and a bag.

D: LIGHT WEIGHT DESIGN

For easy installation and maintenance. Although the CamSafe is very robust, all components are still light. For example during maintenance the door is removable just by 1 person.

E: CORNER SCREWS

Permanent tightness between the units and collectors thanks to the specifically positioned screws in the corner.

F: GASKET FRAME

Very rigid gasket frame. Bended construction and fully welded on the four corners.

② EASY FILTER CHANGEOUT

G: LARGE GROOVE

Thanks to the large groove and the integrated O-ring it's easy to attach the bag. One person can do it – even with gloves on – quickly and without compromising safety. Just a few simple steps and the bag fits tightly to the housing.

H: SECURE BAG

The CamSafe 2 safety bag is designed to offer highest possible protection and convenience for the operator. It is made of an 200 micrometer (0,2 millimeter) thick plastic material, which makes it really strong and tear proof. It has an integrated O-ring for quick and easy mounting. And the safety bag also has a special sleeve function which securely removes any residue from the previous bag.

I: HANDLING TABLE

The CamSafe 2 comes with an optional Filter handling table, to facilitate an easy filter change out.

③ SAFETY FEATURES

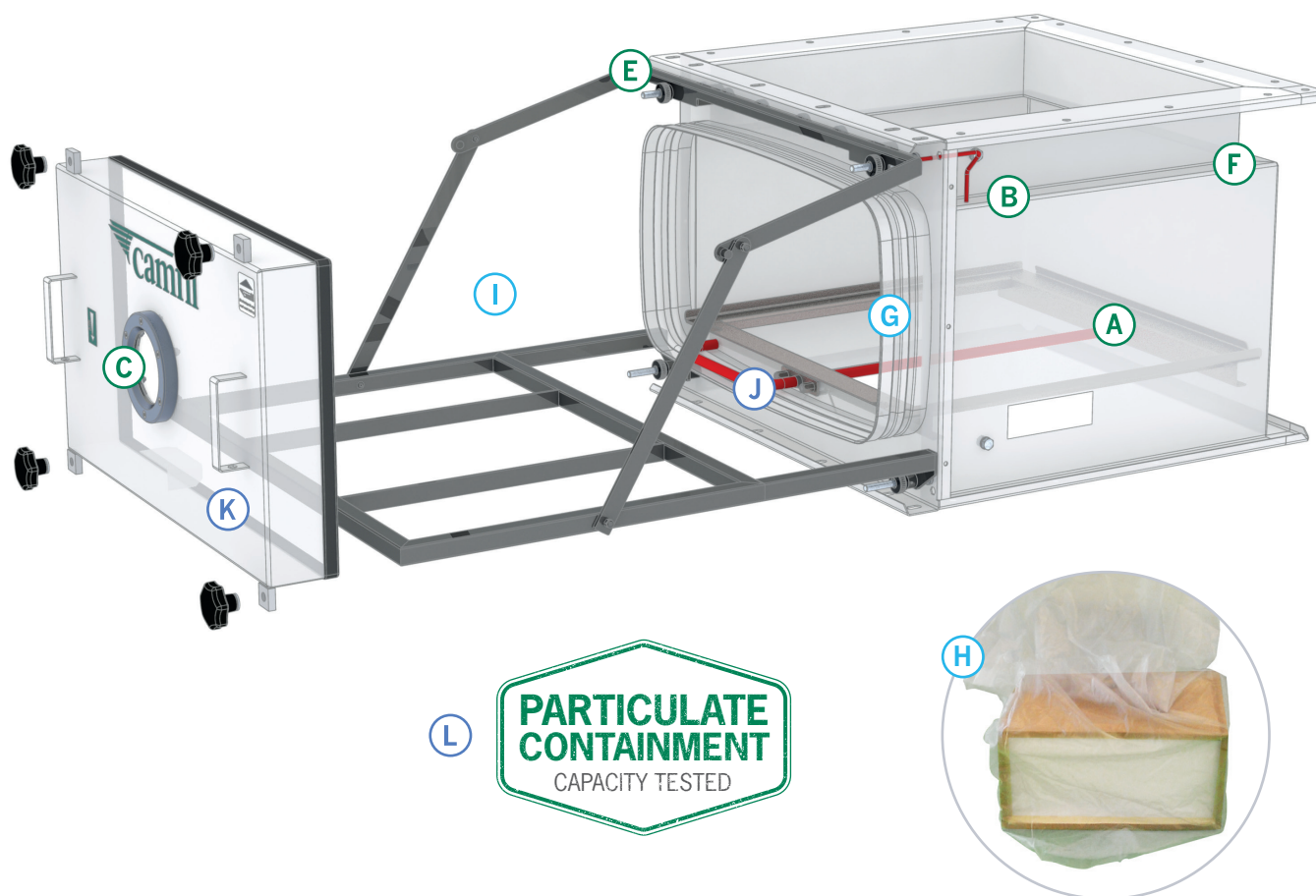
J: CLAMPING DEVICE TRIPLE THE SECURITY

Clamping device – Triple the security **PATENTED** filter safety positioning device. A new construction makes it impossible to clamp the filter unless it's fitted correctly. This is a unique Camfil feature which increases the safety level by eliminating incorrect filter installations. This protects the operator further.

K: SECURED FILTER CLAMPING DEVICE

Impossible to close the door if the shaft is not in the locked position.

L: PARTICULATE CONTAINMENT PERFORMANCE TESTED (SMEPAC)



CAMSAFE 2 NOT ONLY A TIGHT HOUSING

CamSafe 2 is more than a tight housing for contamination-free filter change, because it goes beyond the technical specifications. Allowing you to focus on your business rather than your equipment.

DESIGN

Camsafe housings can provide a filter change free of contamination. They are available as single modules or modular systems depending on the number of filtration stages required and air volume.

GASTIGHT CONSTRUCTION

The housings consist of a gastight welded robust construction of sheet metal and a safety door, which is secured by 4 star grip screws. Each housing has a separate safe change ring for each filter, a PVC bag is secured onto it by means of a rubber locking ring.

FILTER HOUSING

The CamSafe 2 housing can be fitted with a wide range of particulate filter efficiencies as well as a range of molecular filters. By means of a quick clamping device the filter gasket is pressed against the gasket seat to do this, the lever must be turned 180 degrees. Failsafe mechanism ensures safety.

TESTING

The CamSafe 2 has been tested and qualified in our laboratory. Mechanical resistance and global and local leak efficiencies have been checked under positive and negative pressure of 6000 Pa.

MODULAR CONFIGURATION

1. PRODUCT: CamSafe 2 (CS2)

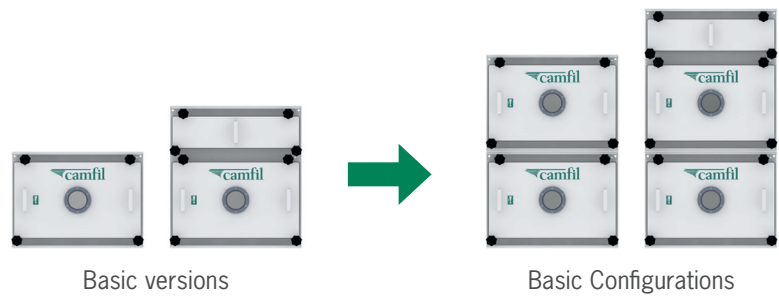
2. HOUSING SIZES:



Housing size	3P3MG	3P3	3P6	6P6	7P6
Filter size	305x305x110	305x305x292	305x610x292	610x610x292	762x610x292

3. MODEL STAGES:

	PRE FILTER Height: 50 mm	FILTER Height: 292 mm
F	0	1
PF + F	1	1
F + F	0	2
PF + F + F	1	2



4. MATERIALS & FINISH:

- Carbon Steel 1.0038 – powder coated
- SS AISI 304L (1.4307) – pickled & glassblasted
- SS AISI 316L (1.4404) – pickled & glassblasted

5. HOUSING OPTIONS:

- DIN Filter seal testing port
- WIN Door Window
- ATEX Electrostatic certificate

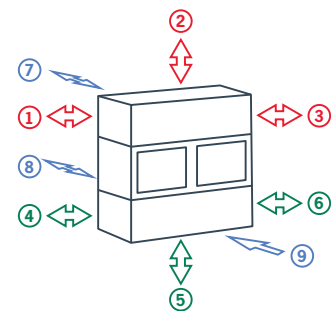
6. STANDARD CONFIGURATIONS

Up to 6 filter columns can form a bank with common collectors.



7. CONNECTION DUCTS:

1. Top left
2. Top
3. Top right
4. Bottom left
5. Bottom
6. Bottom right
7. Top back
8. Bottom back
9. Bottom front



HORIZONTAL FLOW

Saving space or reducing ducting complexity have driven our range to be declined into “horizontal flow” left/right and right/left. Specific adjustments (compare to top/bottom) flow are mandatory to reach highest safety level and sustainable maintenance.



DAMPERS

A selection of adapted dampers compatible with our range of terminal and BIBO housings:

- Concentric design
- Shut-off and regulating device
- Spitted shaft
- Long neck of the body according to heating system requirements
- Red epoxy painting RAL 2002 – minimal thickness of 80 µm
- Safe movement of disc ensured by squared stem/ disc connection
- ATEX certificate (Group II, Category 1/2 GD TX)
- Demountable valve design.

LEAK TEST STANDARDS

- EN 12266-1, Rate A
- ISO 5208, Rate A
- API 598, Table 5
- ANSI/FCI 70-2, Class VI
 - All valves pass pressure tests to 110% of rated pressure to ensure bubble tight shutoff
 - All actuators are calibrated and cycle tested before shipment.



MOBILE INTEGRITY PROBE

NON INTRUSIVE FILTER INTEGRITY TEST

To perform the filter integrity test, no material is removed all connection ports are airtight. During the normal service of the filter the connection ports are covered.

BETTER EFFICIENCY GUARANTEE QUALIFICATION

During the test design, we noticed that individual scan device is much more accurate related to the overall efficiency validation.

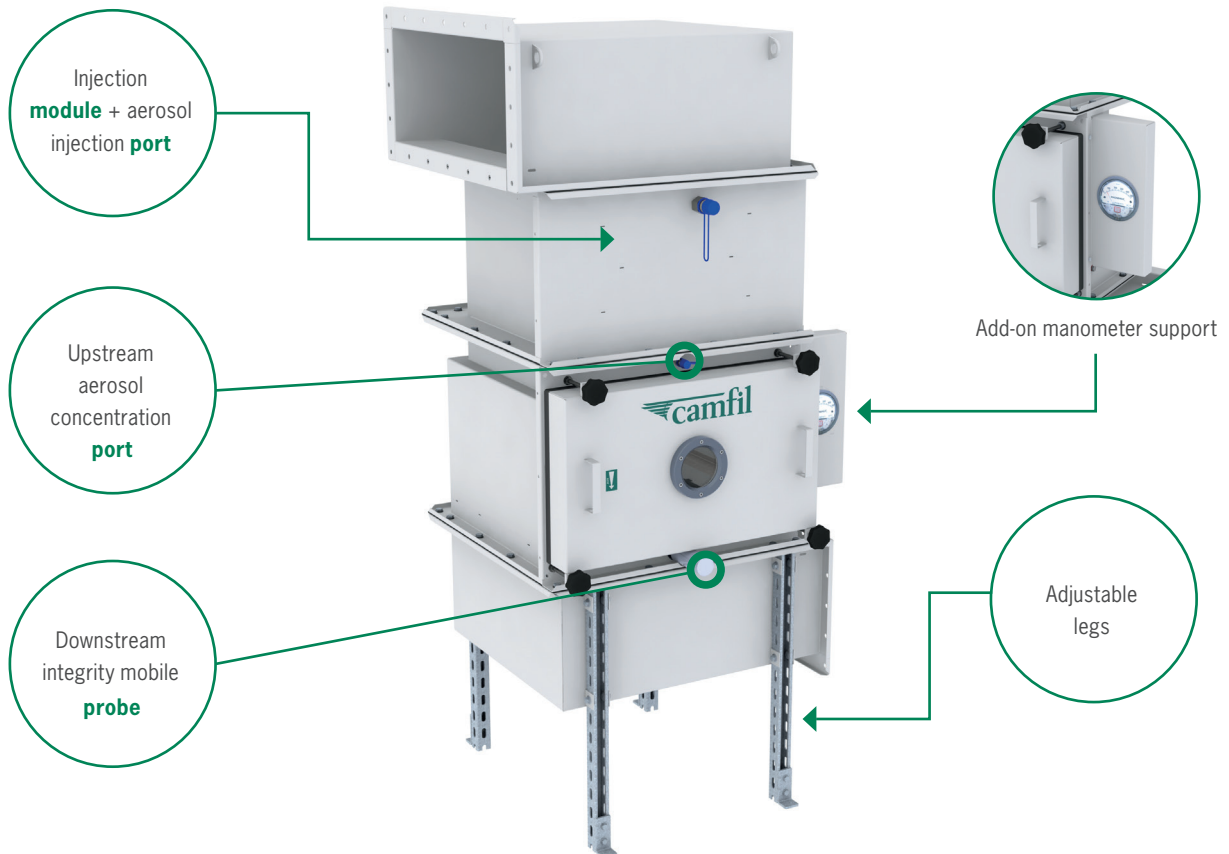
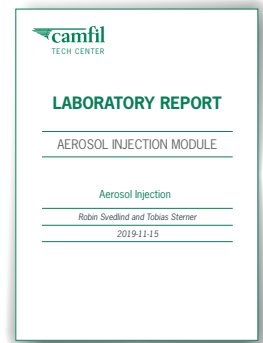
RELIABILITY WITH GOOD MIXING AEROSOL INJECTION

Aerosol is equally dispersed on the inlet surface of the HEPA filter. In case of multi cells, we all know that the airflow could be less than 15% in the first cell. This is the reason why each cell is equipped with an individual aerosol injection port. If the fan is located on the upstream side and the aerosol injected before the fan, then a Particle injection system is not required.

EASINESS, QUICKNESS, CLEANLINESS

All the protocol qualification is concentrated on the filtration equipment. No need to have access to the inlet and outlet duct area. In the case of overall intrusive test on downstream duct, if a leak is detected, it's impossible to determine which filter is damaged. This investigation is difficult and requires a lot of time.

With the individual probe test the faulty filter is immediately detected. The quantity of the aerosol used is less with the individual probe process. Moreover the entire upstream duct is not "contaminated" by the aerosol.



WALL MOUNTED VERSION

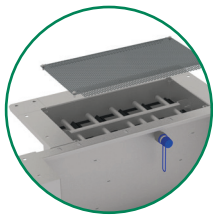
Some applications require contaminated filters to be changed through BIBO and inside the working area (clean room). Containment is not broken... Usually airflow is bottom to top in such set up.



Damper Module

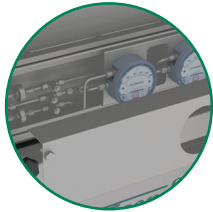
Gastight shutoff of the filter column. Standard DN or custom air hookup.

HEPA STAGE WITH MOBILE INTEGRITY PROBE



Particle Injection Module

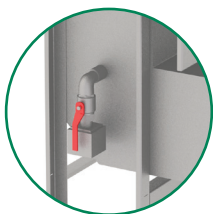
Most reliable results in HEPA filter scanning.



Manometer Tunnel

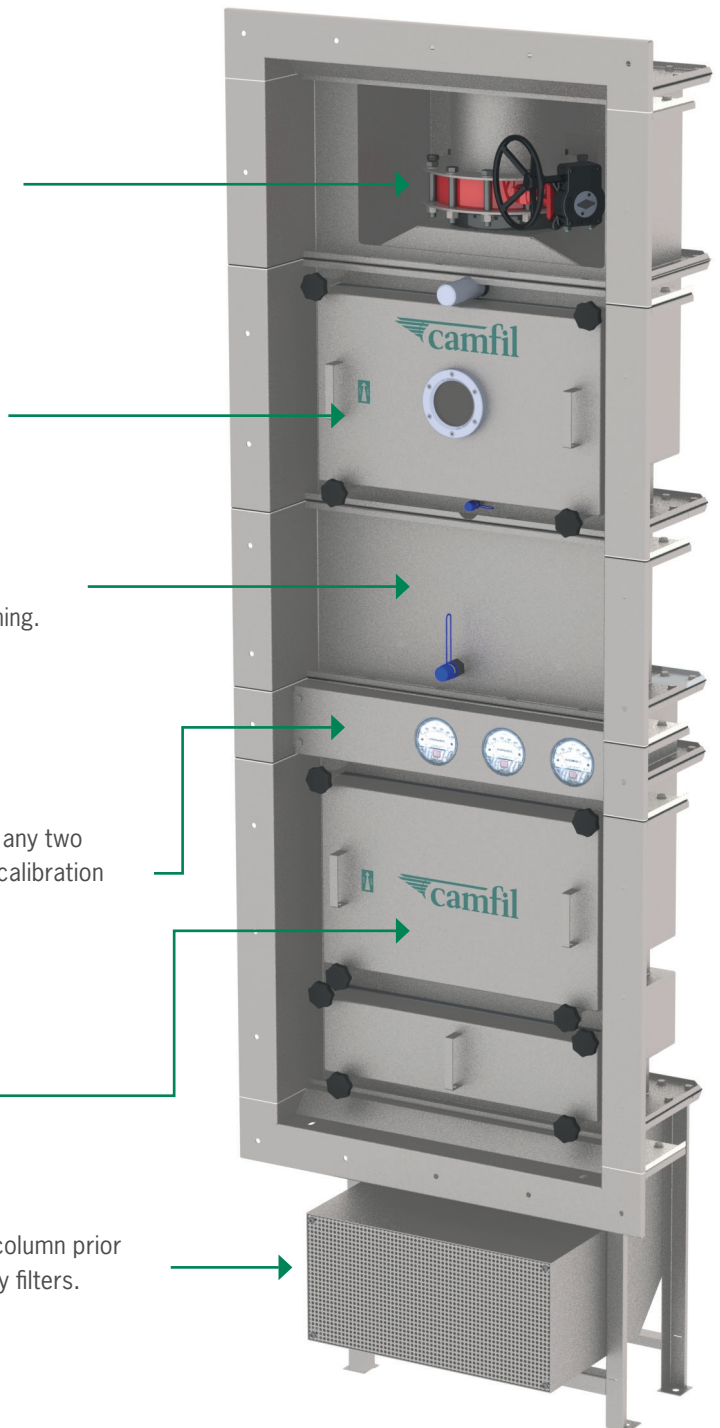
for convenient gauge position between any two modules. Soft or hard piping. Optional calibration ports with ISO 75 U safety disc filters.

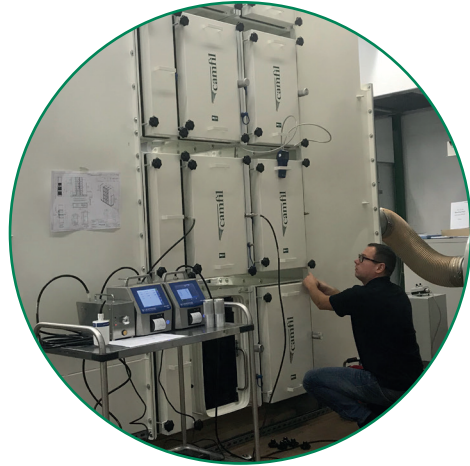
PREFILTRATION STAGES



Pressure Relief Valve

For equalizing pressure of the shut-off column prior to intervention. Includes ISO 75 U safety filters.





AIR ENTRY/SUPPLY

Collector for Camsafe are equally as sensitive as the housing itself. Tightness, rigidity, robustness, H₂O₂ resistance, compatibility with gaskets, etc... are topics, handled with the same care as for the BIBO filter housing.

FAT – FACTORY ACCEPTANCE TEST

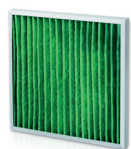
Why not controlling what you are about to install and maintain? Our fully equipped laboratory in Germany welcomes you for static or dynamic FAT and BIBO procedure training.

FROM VERY STANDARD TO VERY CUSTOM

Different needs, same product DNA... and always one objective: A solution for our customers' requirements!



TECHNICAL DATA – FILTER CELLS



PRE FILTER
AeroPleat HP



PRE FILTER
EcoPleat



PRE FILTER
Opakair Green 2



HEPA FILTER
Absolute DR



HEPA FILTER
Absolute VGXL



MOLECULAR FILTER
ActiCarb 2

PRE FILTER

Name	Filter class according ISO 16890	Size W x H x D (mm)	Media surface (m ²)	Air flow (m ³ /h)	Pressure drop (Pa)
AeroPleat HP	Coarse 65%	305 x 610 x 50	0.6	1800	100
AeroPleat HP	Coarse 65%	610 x 610 x 50	1.1	3600	100
AeroPleat HP	Coarse 65%	762 x 610 x 50	1.7	5400	100
EcoPleat	ePM1 55%	305 x 610 x 5	2.9	1450	120
EcoPleat	ePM1 55%	610 x 610 x 50	5.89	2900	120
EcoPleat	ePM1 55%	762 x 610 x 50	8.8	4350	120
Opakair Green 2	ePM1 80%	305 x 610 x 292	9.6	1700	135
Opakair Green 2	ePM1 80%	610 x 610 x 292	24.4	3400	135
Opakair Green 2	ePM1 80%	762 x 610 x 292	34	5100	135

FILTER

Name	Filter class according to EN 1822	Size W x H x D (mm)	Media surface (m ²)	Air flow (m ³ /h)	Pressure drop (Pa)
Absolute DR	H14	305 x 610 x 292	19.5	1500	290
Absolute DR	H14	610 x 610 x 292	39.6	3400	290
Absolute DR	H14	762 x 610 x 292	50.1	4250	290
Absolute VEXL, VGXL	H14	610 x 305 x 292	20.5	1500	250
Absolute VEXL, VGXL	H14	610 x 610 x 292	21.6	3400	250
Absolute VEXXL, VGXXL	H14	610 x 305 x 292	20.5	1800	310
Absolute VEXXL, VGXXL	H14	610 x 610 x 292	21.6	4000	310

MOLECULAR FILTER

Name	Size W x H x D (mm)	Version	Active carbon volume (liter)	Recommended temperature (°C)	Recommended relative humidity (%)	Weight (kg)
ActiCarb 2	610 x 305 x 292	4 V version	32.5	0 - 40	30 - 70	45
ActiCarb 2	610 x 610 x 292	4 V version	65	0 - 40	30 - 70	82



Camfil – a global leader in air filters and clean air solutions

For more than half a century, Camfil has been helping people breathe cleaner air. As a leading manufacturer of premium clean air solutions, we provide commercial and industrial systems for air filtration and air pollution control that improve worker and equipment productivity, minimize energy use, and benefit human health and the environment. We firmly believe that the best solutions for our customers are the best solutions for our planet, too. That's why every step of the way – from design to delivery and across the product life cycle – we consider the impact of what we do on people and on the world around us. Through a fresh approach to problem-solving, innovative design, precise process control and a strong customer focus we aim to conserve more, use less and find better ways – so we can all breathe easier.

The Camfil Group is headquartered in Stockholm, Sweden, and has 30 manufacturing sites, six R&D centres, local sales offices in 30 countries, and about 4,800 employees and growing. We proudly serve and support customers in a wide variety of industries and in communities across the world. To discover how Camfil can help you to protect people, processes and the environment.

www.camfil.com

For further information please contact your nearest Camfil office.