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Application matrix

DUTY	VERY LIGHT	LIGHT	MODERATE	MODERATE	MODERATE	HEAVY	HEAVY	VERY HEAVY
SEGMENT	IAQ	COMFORT	SENSITIVE ENVIRONMENT	CLEAN ROOMS	LIGHT PROCESS	CORROSION CONTROL	INDUSTRIAL EXHAUST	EMERGENCY PROTECTION
EXAMPLE	CITY CENTRE OFFICE	AIRPORT	MUSEUM AND IVF CLINIC	SEMI-CONDUCTOR	SMALL FACTORY	PETROCHEM. PULP & PAPER	WASTE HANDLING	MINE REFUGE
CUSTOMER PROBLEM	NON-SPECIFIC	SPECIFIC	SPECIFIC	SPECIFIC	SPECIFIC	SPECIFIC	VERY SPECIFIC	VERY SPECIFIC
MAKE-UP AIR	CITY FAMILY / CAMCARB	CAMCARB	CAMCARB	CAMCARB / GIGAPLEAT	CAMCARB	PROCARB		PROCARB
RECIRC. (RETURN) AIR	CITY FAMILY	CITY FAMILY	CITY FAMILY / GIGAPLEAT	GIGAPLEAT	CAMCARB	CAMCARB		PROCARB
EXHAUST AIR					CAMCARB		PROCARB	



Molecular filter test equipment according to ISO 10121

Why molecular filtration?

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

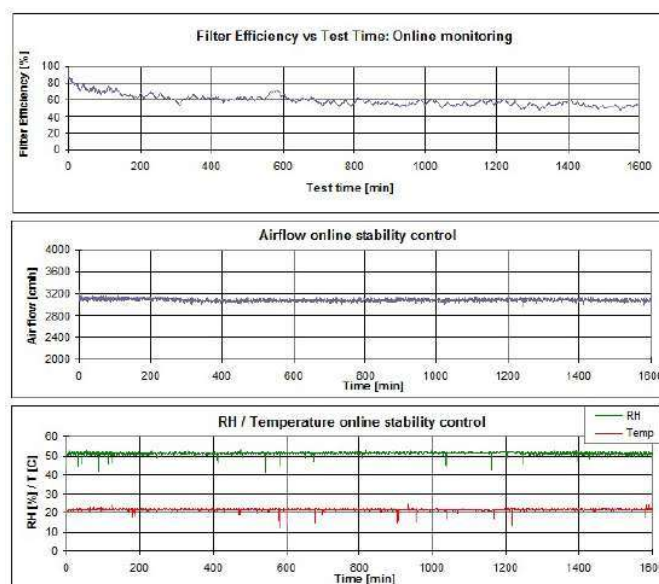
Molecular gaseous compounds are invisible and all around us. Some of these compounds are so toxic, and yet so hard for us to detect, that they can do us harm without even realizing we have been exposed.

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.



Test according to ISO 10121

Additional services

Camfil offers a wide range of AMC focused services that allow our customers to remain focused on their core business. These service 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.

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.



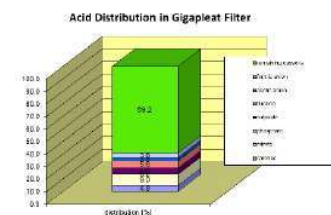
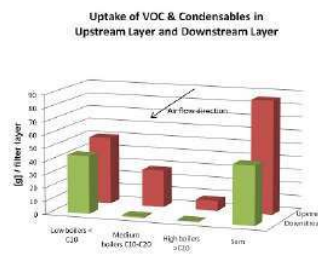
On-line corrosion monitoring

(ISA Check II)

The Camfil ISA-Check II is a highly sensitive second-generation instrument for measuring the corrosivity of air in real time. It is a vital tool for protecting valuable electronic equipment and other objects from corrosion caused by airborne acidic gases.

ISA-Check II measures and registers the change over time in the electrical resistance (ER) of a thin metal track applied on an insulating substrate.

If the metal corrodes, the cross sectional area of the track decreases and the ER increases. The changes in ER can be directly translated into corrosion depth and corrosion rate. ISA-Check II measures loss of metal thickness and therefore the technique provides a direct correlation to corrosivity.



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.

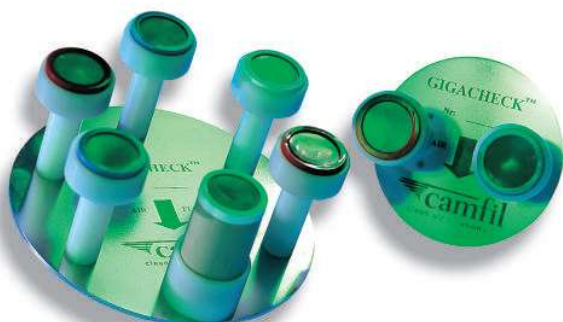
The kit and the samplers are supplied in a case and sealed plastic bags.

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 (NH_3), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2), Hydrogen Sulfide (H_2S) 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 NH_3 , UV fluorescence detectors for SO_2 and H_2S , NH_3 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.



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.



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 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 odourous gases in waste water treatment applications and the protection of sensitive artefacts in museums and art galleries.

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 , formaldehyde, ethylene, low mol. wt. aldehydes.	Activated alumina with chemical impregnation.
CamPure 8	High capacity for H ₂ S, SO ₂ formaldehyde, ethylene, low mol. wt. aldehydes.	Activated alumina with chemical impregnation.
CamPure 9	High capacity for H ₂ S, SO ₂ formaldehyde, ethylene, low mol. wt. aldehydes.	Activated alumina with chemical impregnation.
CamPure 10	High capacity for H ₂ S, SO ₂ formaldehyde, ethylene, low mol. wt. aldehydes	Activated alumina with chemical impregnation.
CamPure 15	High capacity for acids	Activated alumina 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.	CP83 (CamPure 8 + CEX003) CP43 (CamPure 4 + CEX003) CP84 (CamPure 8 + CEX004) CP44 (CamPure 4 + CEX004)

Applicable Standards for Corrosion Control

Common Reference Standards

There are two commonly referenced standards that categorise environmental conditions in relation to the deployment and reliability of electronic equipment:

1. IEC 60721-3-3
2. ANSI/ISA-71.04-2013.

IEC 60721-3-3 categorises environmental conditions based on several parameters such as climatic conditions, biological and chemical contaminants and mechanical effects.

ANSI/ISA-71.04-2013

ANSI/ISA-71.04-2013 is the most popular and focuses on airborne contaminants and observed rates of corrosion for copper and silver metals.

ANSI/ISA-71.04-2013 defines 4 classes of air quality that relate to different rates of reactivity or corrosion of copper and silver. These are; G1 Mild, G2 Moderate, G3 Harsh and GX Severe.

For reference, the standard tabulates concentrations of different gases that approximately correspond to the 4 categories of copper reactivity. It is worth noting that extremely low concentrations of some agents are required to achieve G1 Mild conditions.

Most original equipment manufacturers require provision of G1 Mild conditions as part of their warranty conditions since the standard states for class G1 that "Corrosion is not a factor in determining equipment reliability". The external ambient air at some heavy process industries will routinely be classified as GX Severe.

ISA Classification of reactive environments (ANSI/ISA 71.04-2013)

	Environment sufficiently well controlled such that corrosion is not a factor in determining equipment reliability	Environment in which the effects of corrosion are measurable and may be a factor in determining equipment reliability	Environment in which there is a high possibility that corrosive attack will occur. These harsh levels should prompt further evaluation resulting in environmental controls	Environment in which only specially designed and packaged equipment would be expected to survive
Security level	G1 (MILD)	G2 (MODERATE)	G3 (HARSH)	GX (SEVERE)
Copper reactivity level *	<300	<1000	<2000	≥2000
Silver reactivity level *	<200	<1000	<2000	≥2000

* In angstroms, normalized to a 30-day exposure

COPPER REACTIVITY LEVELS (A/month)		G1 (MILD)	G2 (MODERATE)	G3 (HARSH)	GX (SEVERE)
GROUP	GAS	GAS CONCENTRATION (parts per billion)			
A	Hydrogen sulfide (H ₂ S)	< 3	< 10	< 50	50
	Sulfur dioxide (SO ₂)	< 10	< 100	< 300	300
	Sulfur trioxide (SO ₃)				
	Chlorine (Cl ₂)	< 1	< 2	< 10	10
	Nitrogen oxides (NO _x)	< 50	< 125	< 1,250	1,250
B*	Hydrogen fluoride (HF)	< 1	< 2	< 10	10
	Ammonia (NH ₃)	< 500	< 10,000	< 25,000	25,000
	Ozone (O ₃)	< 2	< 25	< 100	100

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Note of caution :

The standard indicates concentrations of individual gases that loosely correspond to the 4 classes of corrosivity. If multiple gases are present in the air, a synergistic effect on the observed rate of corrosion that is difficult to quantify may occur. As a consequence, on-site monitoring for a single or multiple gases may not in itself predict or explain corrosion of silver and copper.

Loose-Filled Deep Beds

VDBs



Vertical Deep Bed Supply filters (VDBs) are members of the Camfil “ProCarb” range of industrial molecular filtration solutions. This product is designed to ensure the very highest levels of performance in those applications where the elimination of corrosive gases is essential to meet the tightest environmental conditions that are specified by electrical equipment manufacturers. Heavy process industries rely on sophisticated electronic control systems and power distribution systems to operate their processes safely and with high efficiency. In certain industries, acidic gases that are strongly corrosive are present in the air. These gases are liberated from the process raw materials. If left uncontrolled, these gases can degrade; even destroy the electronic/electrical control systems.

VDBe



Vertical Deep Bed filters (VDBe) are durable cost effective molecular filtration solutions for exhaust streams from industrial processes. This product is designed to ensure the very highest levels of performance in those applications where the elimination of toxic gases and odours is essential for operational security and/or regulatory compliance. Performance is delivered in terms of extremely high removal efficiency and the longest possible lifetime per fill of filtration media. Standard features ensure reliable and safe operation. Two equipment configurations are available with airflow capacities ranging from 10,000 to 105,000 m³/h. Virtually any molecular filtration media may be selected for use in the filters, depending on the contaminant(s) to be controlled. VDBe filters are completely passive in operation and require very little routine maintenance.

HDB



The Horizontal Deep Bed filters (HDB) filter is a robust solution for removing corrosive gases, odours or toxic gases from make-up air and exhaust air systems with very high efficiency on a single pass basis. The filters contain horizontal beds of molecular filtration media that are retained on top of a horizontal perforated screen. The air passes vertically through the media bed. The normal airflow direction is upward, but this arrangement can be reversed in some applications. The filters utilise a very deep bed of media and they are particularly well suited to applications that combine low to moderate airflows and relatively high contaminant concentrations.

A range of standard sizes accommodate flows from 500 m³/h to 5,000 m³/h. Pre and after-filters can be incorporated by the addition of bolt-on housing to provide a total filtration solution. HDB filters are safe and simple to install. They are completely passive in operation and require little or no routine maintenance beyond changing the filters and media. Fans and variable speed drives can be incorporated as options.



CamCarb PM



Advantages

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

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

Type: Loose fill adsorbent panels.

Frame: Galvanized steel.

Media: Activated carbon, Impregnated Activated Carbon, Activated Alumina.

Temperature: Max. 40°C in continuous service.

Recommended relative humidity: 30 - 70%.

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



Type	Dimensions WxHxD (mm)	Air Flow/pressure drop (m³/hr/Pa)	Weight (kg)
CamCarb PMLGS048	600x600x24	680/125	9
CamCarb PMLGS048	300x600x24	340/125	4.5

Above are sample sizes, filters are available in a comprehensive range of sizes, please specify
For all media options please refer to page 133

CamCarb PM V



Advantages

- Reusable V cell housing
- Exchangeable loose-filled panels
- Cost optimized life cycle
- High performance
- Suitable for a wide range of air volumes

Application: Absorption of odours and gases in air conditioning applications.
Type: Loose-filled panels in V cell housing (removable sheet metal panels for replacement).

Frame: Stainless steel housing, Galvanized steel panels.

Media: Activated carbon, Impregnated Activated Carbon, Activated Alumina.

Gasket: 01 = downstream, 10 = upstream

Recommended temperature range: Max. 40°C in continuous service.

Recommended relative humidity: 30 - 70%.



Type	Housing Type	Dimensions WxHxD (mm)	No of panels per layer	Number of panels per housing	Air Flow/pressure drop (m³/hr/Pa)	Appr.Weight with panel (kg)
CamCarb PM V - LGS048	DH: Box type	610x610x292	8	16	2600/300	80
CamCarb PM V - LGS048	DH: Box type	305x610x292	4	8	1100/300	42
CamCarb PM V - LGS048	PH: Single header	592x592x292	8	8	2600/180	40
CamCarb PM V - LGS048	PH: Single header	287x592x292	4	4	1100/180	22

For all media options please refer to page 135

CamCarb PC



Advantages

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

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

Type: Loose fill absorbent panels.

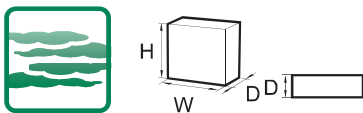
Frame: Galvanized steel.

Media: Activated carbon, Impregnated Activated Carbon, Activated Alumina.

Temperature: Max. 40°C in continuous service.

Recommended relative humidity: 30 - 70%.

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



Type	Dimensions WxHxD (mm)	Air Flow/pressure drop (m³/hr/Pa)	Weight (kg)
CamCarb PC-LGS048	594x594x47	850/70	7.5
CamCarb PC-LGS048	594x289x47	425/70	4

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's 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 CG and CamCarb CM). 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

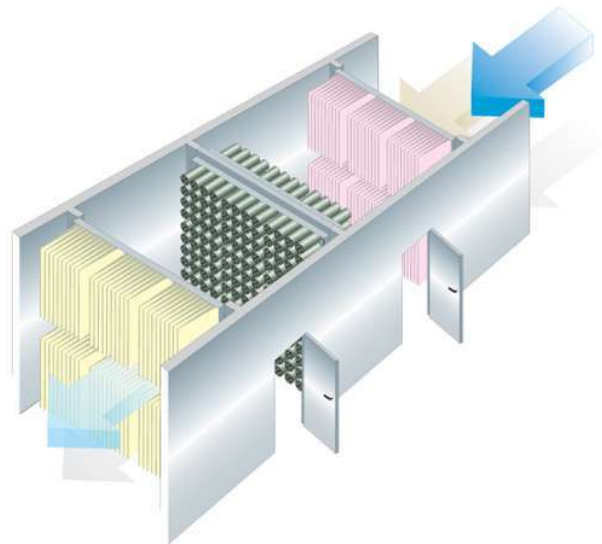
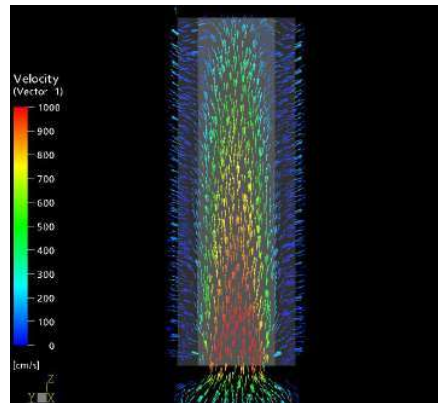
The CamCarb cylinders can be emptied and refilled with new media. This service offers lower operational cost compared to the replacement of the whole cylinder.

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

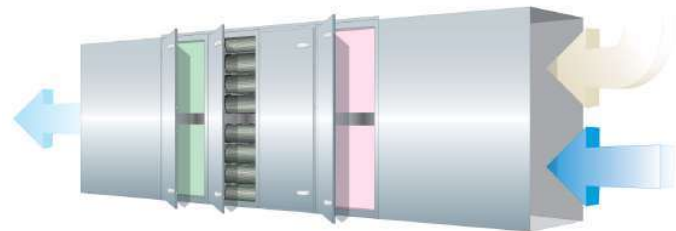
A spare set of cylinders is required to maintain the system operation during the filling process.

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.

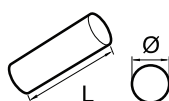


Example of RZA/MZA modular frame set system



Application in make-up air unit

CamCarb CG



Advantages

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

Media: Activated carbon, Impregnated Activated Carbon, Activated Alumina.

Cleanliness: Internal scrim protection.

Temperature: -20°C to 60°C.

Mounting system: Dedicated base plate in 3 standard sizes (1.5mm, 2.0mm, 2.5mm thickness).

Models ^{#1}	Length (mm)	Diameter (mm)	Air flow (m ³ /hr) ^{#2}	Pressure drop (Pa) ^{#2}	Optimum Temperature (°C)	Optimum RH (%)	Nominal weight (kg)
CamCarb CG 1300 Bases	240	148	1250	80	10-60	40-90	1.6
CamCarb CG 1300 Acids	240	148	1250	80	10-60	40-90	1.6
CamCarb CG 1300 Acids_H2S^	240	148	1250	80	10-60	40-90	2.4
CamCarb CG 1300 VOC	240	148	1250	80	Max.40	0-70	1.6
CamCarb CG 1300 VOC_03_Acid_H2S	240	148	1250	100	10-60	40-90	2.0
CamCarb CG 1300 VOC_03_NO2_SO2	240	148	1250	60	Max.40	0-70	1.5
CamCarb CG 1300 H2S_Mercaptans	240	148	1250	80	10-60	40-90	1.6
CamCarb 1300 SO2_H2S^	240	148	1250	80	10-60	40-90	2.4
CamCarb CG 2600 Bases	452	148	2500	135	10-60	40-90	2.9
CamCarb CG 2600 Acids	452	148	2500	135	10-60	40-90	2.9
CamCarb CG 2600 Acids_H2S^	452	148	2500	135	10-60	40-90	4.4
CamCarb CG 2600 VOC	452	148	2500	135	Max.40	0-70	2.9
CamCarb CG 2600 VOC_03_Acid_H2S	452	148	2500	150	10-40	40-70	3.6
CamCarb CG 2600 VOC_03_NO2_SO2	452	148	2500	100	Max.140	0-70	2.8
CamCarb CG 2600 H2S_Mercaptans	452	148	2500	135	10-60	40-90	2.9
CamCarb CG 2600 SO2_H2S^	452	148	2500	135	10-60	40-90	4.4
CamCarb CG 3500 Bases	595	148	3400	175	10-60	40-90	3.8
CamCarb CG 3500 Acids	595	148	3400	175	10-60	40-90	3.8
CamCarb CG 3500 Acids_H2S^	595	148	3400	175	10-60	40-90	5.7
CamCarb CG 3500 VOC	595	148	3400	175	Max.40	0-70	3.8
CamCarb CG 3500 VOC_03_Acid_H2S	595	148	3400	210	10-40	40-70	4.7
CamCarb CG 3500 VOC_03_NO2_SO2	595	148	3400	165	Max.40	0-70	3.7
CamCarb CG 3500 H2S_Mercaptans	595	148	3400	175	10-60	40-90	3.8
CamCarb CG 3500 SO2_H2S^	595	148	3400	175	10-60	40-90	5.7

#1 - Other models with different media options are available. High performance media will be selected in accordance to the type of application. * Airflow and dp values stands for 16 cylinders on a 610x610 base plate

#2 - Air flow and pressure drop values stands for 16 cylinders on a 610x610 base plate.

^ - Filled with UL approved media.

CamCarb CM



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
- Stainless steel construction
- Modular and flexible assembly

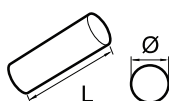
Application: The most reliable molecular filter for high efficiency and long-term control of molecular contaminants in sensitive buildings and process industries.

Type: Cylindrical molecular filter cartridge manufactured from stainless steel.

Media: Activated carbon, Impregnated Activated Carbon, Activated Alumina.

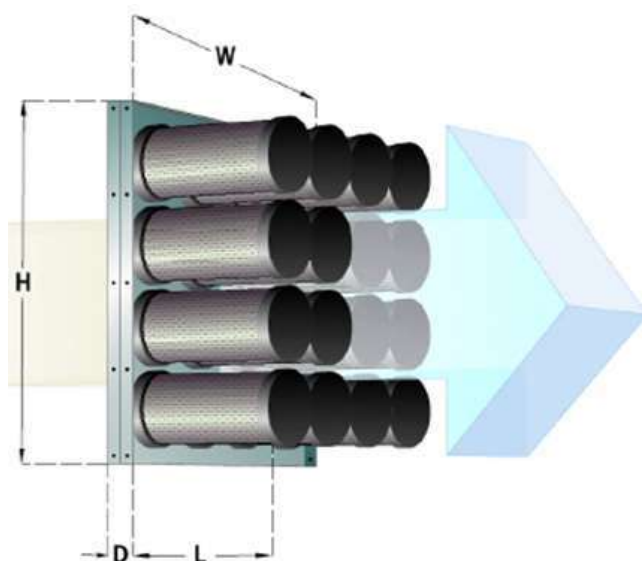
Temperature: -20°C to 60°C.

Mounting system: Dedicated base plate in 3 standard sizes (1.5mm, 2.0mm, 2.5mm thickness).

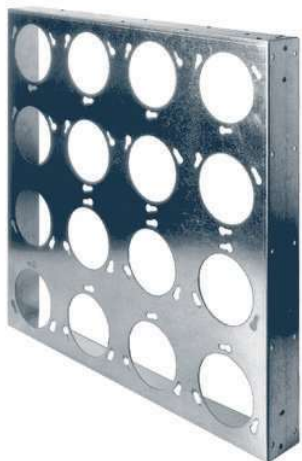


Models ^{#1}	Length (mm)	Diameter (mm)	Air flow (m ³ /hr) ^{#2}	Pressure drop (Pa) ^{#2}	Optimum Temperature (°C)	Optimum RH (%)	Nominal weight (kg)
CamCarb CM 2600 Bases	450	145	2500	110	10-60	40-90	3.9
CamCarb CM 2600 Acids	450	145	2500	110	10-60	40-90	3.9
CamCarb CM 2600 VOC	450	145	2500	110	Max. 40	0-70	3.9
CamCarb CM 2600 VOC H ₂ S_Mercaptans	450	145	2500	110	10-60	40-90	3.9
CamCarb CM 3500 Bases	600	145	3400	190	10-60	40-90	5.2
CamCarb CM 3500 Acids	600	145	3400	190	10-60	40-90	5.2
CamCarb CM 3500 VOCs	600	145	3400	190	Max.40	0-70	5.2
CamCarb CM 3500 H ₂ S_Mercaptans	600	145	3400	190	10-60	40-60	5.2

^{#1} - Other models with different media options are available. High performance media will be selected in accordance to the type of application.
^{#2} - Air flow and pressure drop values stands for 16 cylinders on a 610x610 base plate.



CamCarb Mounting Frames



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 fitting

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

Applicable filters: CamCarb CM and CamCarb CG. (Note : always specify filter type when ordering as base plate thickness may vary to accommodate different weights of filters).

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



Type	Dimensions WxHxD (mm)	Number of Cylinders	Weight (kg)
G8	305x 610x 70	8	3
G12	457x 610x 70	12	5.7
G16	610x 610x 70	16	6

*Available as 1.5mm or 2mm



CamCube CC-L Filter housing



Advantages

- Easy to install
- Modular construction
- No tools needed to change filters
- Gasket to seal between door and filter housing
- Stable and secure design
- Easy maintenance

Application: CamCube CC is a flexible and compact range of filter housings for cylindrical filters in length 450 mm. Two stage filtration is available as an option with a prefilter or afterfilter mounting rail for panel filters.

Type: Housing.

Filter housing material: Aluzinc.

Option: Stainless steel SS EN 1.4301.

Filter: Cylindrical filters for loose filled carbon type Camcarb, available in plastic, GZ-steel or stainless steel (EN1.4301). Filled with different types of adsorbents depending on application. See the relevant page in the catalogue for further information.

Air flow: Recommended air flow at 0,1 at 0,2 sec contact time, see table and relevant product page for further information.

Note: Door hinged on the left or right. Can be changed on site.



CamCube CC is a flexible and compact range of filter housings for cylindrical filters in length 450 mm.

Two stage filtration is available as an option with a prefilter or afterfilter mounting rail for panel filters.

The housing is a sandwich design with 45 mm heat and condensation insulation between, covered with aluzinc sheet metal inside and outside (corrosivity class C4).

The service hatch is hinged mounted. The endless gasket on the inside of the service hatch makes it highly airtight.

The filter housing has a leakage class of C according to EN 15727.

As standard the casing has M8 threads for mounting the filter housing. The filter housing is supplied with a guide connection, and a flange connection is available as an option.

Accessories:

Prefilter or afterfilter mounting rail 50 mm

Adjustable feet (4 pcs set) reference 550902

Hose connectors for pressure drop (2pcs set), supplied separately reference 550901

Hose connectors for pressure drop (2pcs set), factory mounted reference 550900

Lockable handles

Flange adaptor

Example specification text:

Filter housing: CamCube CC-1010. Supplier, Camfil Svenska AB

Design: Sandwich construction with 45 mm heat and condensation insulation, covered with double aluzinc sheet metal (corrosivity class C4)

Leakage class C

Filter: 16 pcs Camcarb 2600 GZ D=145 mm L=450 mm CEX003

Accessories: One set of adjustable feet. Hose connectors for pressure drop, factory mounted

Classification:

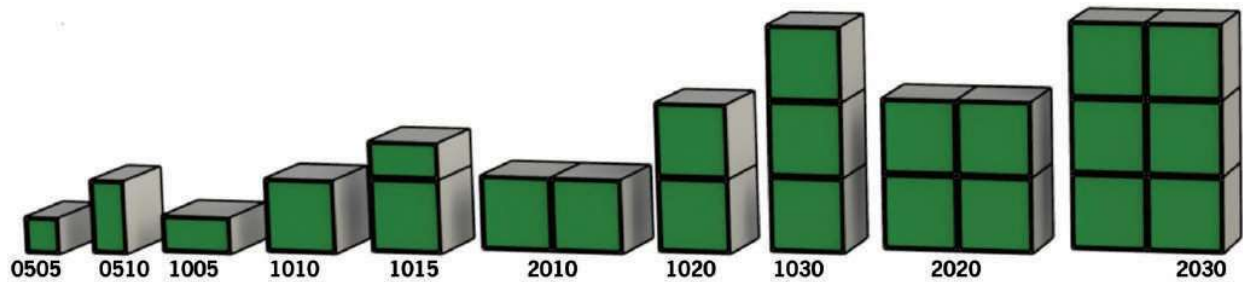
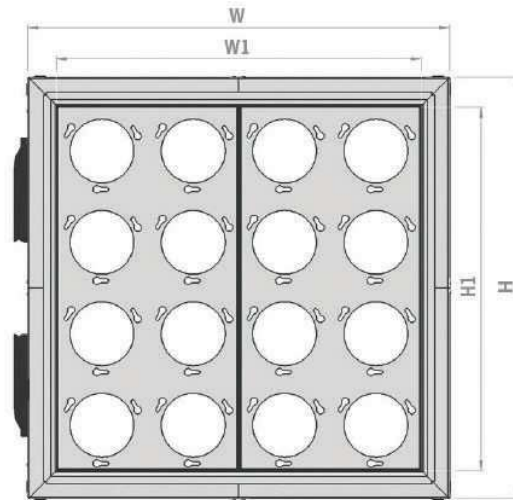
Leakage class C, according to the EN 15727:2010 standard

Leakage class L1 according to the EN 1886:2007 standard

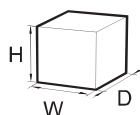
Mechanical performance: D1 according to the EN 1886:2007 standard

Model Name	Dimensions WxHxD (mm)	Inner flanges W1xH1 (mm)	Number of Cylinders	Weight (kg)	Airflow at 0.1s contact time (m³/hr)	Airflow at 0.2s contact time (m³/hr)
CamCube CC-L 0505	392x 392x 700	300x 300	4	24	650	310
CamCube CC-L 0510	392x 692x 700	300x 600	8	34	1300	620
CamCube CC-L 1005	692x 392x 700	600x 300	8	34	1300	625
CamCube CC-L 1010	692x 692x 700	600x 600	16	43	2600	1250
CamCube CC-L 1015	692x 992x 700	600x 900	24	55	3900	1875
CamCube CC-L 1020	692x 1292x 700	600x 1200	32	64	5200	2500
CamCube CC-L 1025	692x 1592x 700	600x 1500	40	76	6500	3150
CamCube CC-L 1030	692x 1892x 700	600x 1800	48	85	7800	3750
CamCube CC-L 1510	992x 692x 700	900x 600	24	53	3900	1875
CamCube CC-L 1515	992x 992x 700	900x 900	36	66	5850	2810
CamCube CC-L 1520	992x 1292x 700	900x 1200	48	76	7800	3750
CamCube CC-L 1525	992x 1592x 700	900x 1500	60	89	9750	4685
CamCube CC-L 1530	992x 1892x 700	900x 1800	72	99	11700	5625

Model Name	Dimensions WxHxD (mm)	Inner flanges W1xH1 (mm)	Number of Cylinders	Weight (kg)	Airflow at 0.1s contact time (m³/hr)	Airflow at 0.2s contact time (m³/hr)
CamCube CC-L 2010	1292x 692x 700	1200x 600	32	62	5200	2500
CamCube CC-L 2015	1292x 992x 700	1200x 900	48	77	7800	3750
CamCube CC-L 2020	1292x 1292x 700	1200x 1200	64	86	10400	5000
CamCube CC-L 2025	1292x 1592x 700	1200x 1500	80	100	13000	6250
CamCube CC-L 2030	1292x 1892x 700	1200x 1800	96	109	15600	7500
CamCube CC-L 2510	1292x 692x 700	1500x 600	40	74	6500	3125
CamCube CC-L 2515	1592x 992x 700	1500x 900	60	89	9750	4685
CamCube CC-L 2520	1592x 1292x 700	1500x 1200	80	98	13000	6250
CamCube CC-L 2525	1592x 1592x 700	1500x 1500	100	113	16250	7810
CamCube CC-L 2530	1592x 1892x 700	1500x 1800	120	123	19500	9375
CamCube CC-L 3010	1892x 692x 700	1800x 600	48	83	7800	3750
CamCube CC-L 3015	1892x 992x 700	1800x 900	72	99	11700	5625
CamCube CC-L 3020	1892x 1292x 700	1800x 1200	96	108	15600	7500
CamCube CC-L 3025	1892x 1592x 700	1800x 1500	120	124	19500	9375
CamCube CC-L 3030	1892x 1892x 700	1800x 1800	144	134	23400	11250



CamCarb VG



Advantages

- May be filled with various molecular filtration medias, depending on the application and contaminant(s)
- Replacement items for Supply and Recirculation Air Systems in industrial applications.

Application: Heavy duty disposable plastic Vee Cell Modules to specifically treat corrosion control of electronic and electrical equipment in heavy process industries. They may also be used in odour removal applications in pulp and paper mills and wastewater treatment plants, or lighter applications such as airports, cultural heritage building and commercial offices.

Type : Vee Cell Module

Frame : ABS and PET

Gasket : Outlet : EPDM, Side : PU Foam

Media: Activated Carbon, Impregnated Activated Carbon, Impregnated Activated Alumina.

Temperature: -21 °C to 80 °C

Installation Options: PSSA Housing, VG track

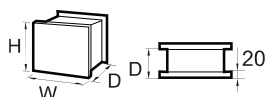
Comment : Filter performance will be affected if used in conditions where T and RH are above or below the optimum conditions.

VG300 can be used in Supply Air Systems, while the VG440 can be used in Supply Air and Recirculation Air Systems

Models ^{#1}	Dimensions WxHxD	Number of modules per 610x610 area	Pressure drop (±15%) ^{#2}	Nominal weight	Optimum Operating Conditions	
			Pa	kg	Temperature °C	RH (%)
CamCarb VG300 SO2_H2S ^{#3}	300x300x300	4	315	14.5	19.10 - 60	40 - 90
CamCarb VG300 Acids_H2S ^{#3}	300x300x300	4	315	14.5	10 - 60	40 - 90
CamCarb VG300 VOC	300x300x300	4	500	10.0	Max. 40	0 - 70
CamCarb VG300 H2S_Mercaptans	300x300x300	4	500	10.0	10 - 60	40 - 90
CamCarb VG300 Acids	300x300x300	4	500	10.0	10 - 60	40 - 90
CamCarb VG440 VOC_O3_Acid_H2S	300x300x300	4	440	11.7	10 - 40	40 - 70
CamCarb VG300 VOC_O3_NO2_SO2	300x300x300	4	560	8.8	Max. 40	0 - 70
CamCarb VG300 Bases	300x300x300	4	500	10.0	10 - 40	40 - 90
CamCarb VG440 SO2_H2S ^{#3}	300x150x440	8	94	6.5	10 - 60	40 - 90
CamCarb VG440 Acids_H2S ^{#3}	300x150x440	8	94	6.5	10 - 60	40 - 90
CamCarb VG440 VOC	300x150x440	8	146	4.5	Max. 40	0 - 70
CamCarb VG440 H2S_Mercaptans	300x150x440	8	146	4.5	10 - 60	40 - 90
CamCarb VG440 Acids	300x150x440	8	146	4.5	10 - 60	40 - 90
CamCarb VG440 VOC_O3_Acid_H2S	300x150x440	8	120	5.6	10 - 40	40 - 70
CamCarb VG440 VOC_O3_NO2_SO2	300x150x440	8	142	4.7	Max. 40	0 - 70
CamCarb VG440 Bases	300x150x440	8	146	4.5	10 - 40	40 - 90

Note :
^{#1} - Other models with different media options are available. High performance media will be selected in accordance to the type of application.
^{#2} - Pressure drop at rated velocity of 1.25 m/s (250 fpm) for VG300 and 2.5 m/s (500 fpm) for VG440.
^{#3} - Filled with UL approved media.

GigaPleat XPC/XPH



Advantages

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

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: 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.

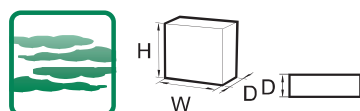
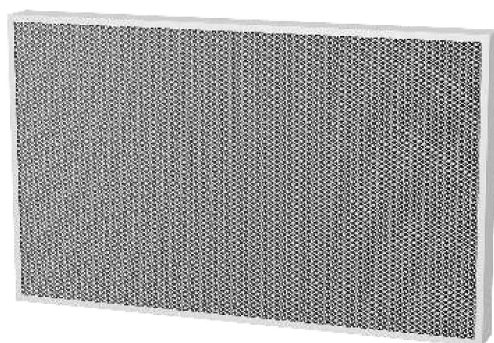
Outgassing: Individually outgassing tested for VOC emissions on request

Product	Type	Material	Dimensions WxHxD (mm)	Number of panels per layer	Number of panels per housing	Appr. weight with panels (kg)
Box Housing	XPC 610x610x292	Stainless Steel	610x610x292	8	16	28
Box Housing	XPC 305x610x292	Stainless Steel	305x610x292	4	8	16
Header Housing	XPH 592x592x292	Stainless Steel	592x592x292	8	8	17
Header Housing	XPH 287x592x292	Stainless Steel	287x592x292	4	4	9

* Box Housing without header frame

Panel	Target contaminant	Fit Housing Width (mm)	Fit Housing Height (mm)	Fit Housing Depth (mm)	Air Flow (m³/hr)	Pressure drop (Pa) ±15%
XPC B	Bases	610/305	610	292	2600/1100	95
XPC A	Acids	610/305	610	292	2600/1100	95
XPC V	Organics	610/305	610	292	2600/1100	95
XPC B	Bases	592/287	592	292	2600/1100	60
XPC A	Acids	592/287	592	292	2600/1100	60
XPC V	Organics	592/287	592	292	2600/1100	60

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, 10 = Upstream, 11 = Downstream and upstream.

Faceguard: 02 = Downstream, 20 = Upstream, 22 = Downstream and upstream.

Recommended temperature range: 10 - 40°C.

Recommended relative humidity: 30 - 70%.

Particle cleanliness: ISO Class 6.

Outgassing: Individually outgassing tested for VOC emissions.

Panel	Target contaminant	Dimension WxHxD (mm)	Air Flow / pressure drop (m³/h/Pa)	Weight (kg)
NXPP B	Bases	610x610x90	535/15	5
NXPP B	Bases	1220x610x90	1070/15	10
NXPP A	Acids	610x610x90	535/15	5
NXPP A	Acids	1220x610x90	1070/15	10
NXPP V	Organics	610x610x90	535/15	5
NXPP V	Organics	1220x610x90	1070/15	10
NXPP ABV	Bases, Acids, Organics	610x610x150	535/50	14
NXPP ABV	Bases, Acids, Organics	1220x610x150	1070/50	28

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

GigaPleat NXPH



Advantages

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

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

Type: Compact filter with header.

Frame: ABS.

Sealant: Polyurethane.

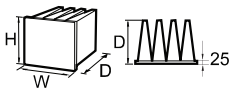
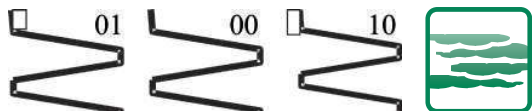
Gasket: 01 = downstream, 10 = upstream.

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	Target Contaminant	Dimensions WxHxD (mm)	Air flow/Pressure loss (m³/hr/Pa)	Weight (kg)
NXPH B	Bases	592x592x292	3300/50	12
NXPH B	Bases	592x287x292	1600/50	6.5
NXPH A	Acids	592x592x292	3300/60	12
NXPH A	Acids	592x287x292	1600/60	6.5
NXPH V	Organics	592x592x292	3300/60	12
NXPH V	Organics	592x287x292	1600/60	6.5

GigaPleat NXP



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	Target Contaminant	Dimensions WxHxD (mm)	Air Flow/pressure drop (m ³ /hr/Pa)	Weight (kg)
NXPC B	Bases	610x 610x 292	2600/ 60	15
NXPC B	Bases	305x 610x 292	1100/ 60	8
NXPC B	Bases	595x 595x 292	2600/ 60	15
NXPC B	Bases	289x 595x 292	1100/ 60	8
NXPC B	Bases	592x 592x 292	2600/ 60	15
NXPC A	Acids	287x 592x 292	1100/ 60	8
NXPC B	Bases	610x 610x 292	2600/ 60	15
NXPC A	Acids	305x 610x 292	1100/ 60	8
NXPC A	Acids	595x 595x 292	2600/ 60	15
NXPC A	Acids	289x 595x 292	1100/ 60	8
NXPC A	Acids	592x 592x 292	2600/ 60	15
NXPC A	Acids	287x 592x 292	1100/ 60	8
NXPC V	Organics	610x 610x 292	2600/ 60	15
NXPC V	Organics	305x 610x 292	1100/ 60	8
NXPC V	Organics	595x 595x 292	2600/ 60	15
NXPC V	Organics	289x 595x 292	1100/ 60	8
NXPC V	Organics	592x 592x 292	2600/ 60	15
NXPC V	Organics	287x 592x 292	1100/ 60	8

GigaPleat NXDP



Advantages

- Low pressure drop
- Individually VOC outgassing tested
- High media cleanliness
- Multiple media types can be combined into the same filter

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

Type: Deep pleated filter.

Frame: Galvanized Steel (others on request). DH: Box type, PH: Single Header.

Sealant: Polyurethane.

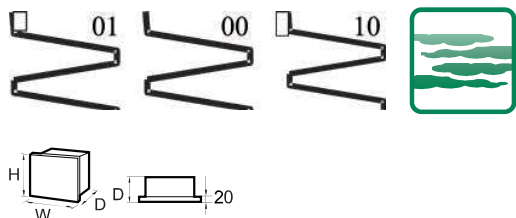
Gasket: 01 = downstream, 10 = upstream.

Recommended temperature range: 10 - 40°C.

Recommended relative humidity: 30 - 70%.

Particle cleanliness: ISO Class 6.

Outgassing: Individually outgassing tested for VOC emissions.



Model Name *	Target contaminant	Dimensions WxHxD (mm)	Air Flow/pressure drop (m³/hr/Pa)*	Weight (kg)
NXDP B	Bases	592x 592x 292	3300/ 50	15
NXDP B	Bases	287x 592x 292	1600/ 50	10
NXDP A	Acids	592x 592x 292	3300/ 50	15
NXDP A	Acids	287x 592x 292	1600/ 50	10
NXDP V	Organics	592x 592x 292	3300/ 50	15
NXDP V	Organics	287x 592x 292	1600/ 50	10
NXDP ABV	Bases, Acids, Organics	592x 592x 292	3300/ 140	20
NXDP ABV	Bases, Acids, Organics	287x 592x 292	1600/ 140	12

*Other media combinations available on request

*Pressure drop based on DH (Box type) frame