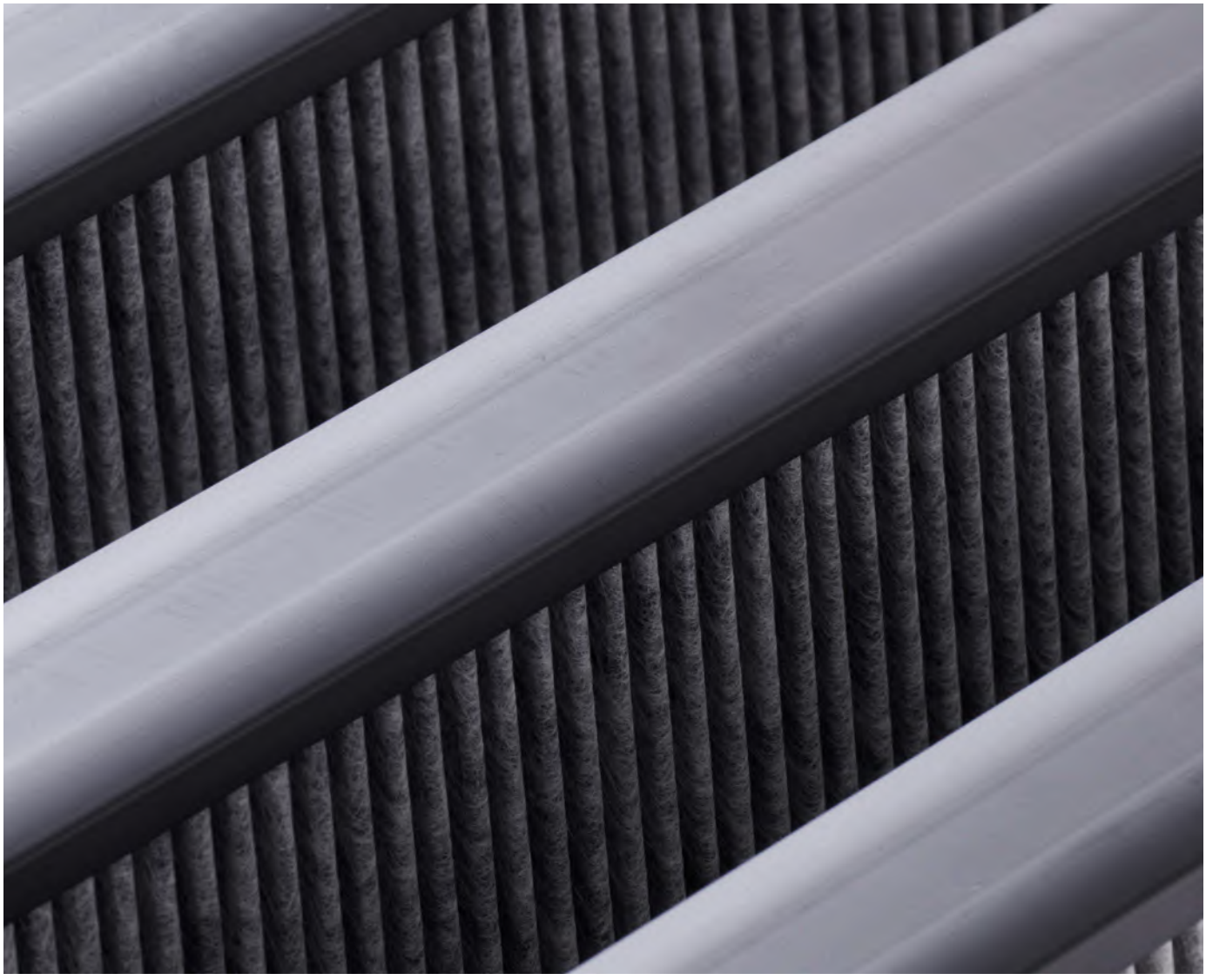
Carboactiv Molecular Filtration



Leadership in Filtration

MANN+HUMMEL

The Carboactiv range of molecular air filters

PROTECTION AGAINST GASEOUS CONTAMINANTS

Gas adsorption and chemisorption filters typically use a range of activated carbon, impregnated media, chemical catalysts and oxidizers to remove harmful gaseous pollutants from an air flow. In doing so, these filters eliminate smells, odors and toxic air pollution, prevent corrosion, and protect valuable products, processes or artefacts.

Molecular air filters also protect humans and animals from sick building syndrome – as documented by the World Health Organization.

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THE MOLECULAR EXPERTS

MANN+HUMMEL's molecular air filter product range features a large variety of specialist physical and chemical activity options, and also standard, plug n' play formats – including combined particle and molecular filters that fit in any standard HVAC housing.

If you have a high flow rate, non-standard application that requires a special molecular filtration stage, please contact your local MANN+HUMMEL representative and we will be glad to help you.

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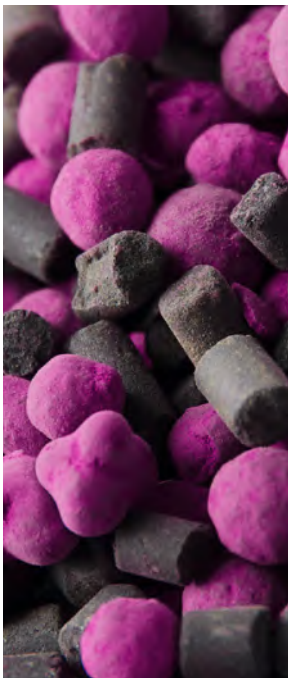
Carboactiv Fill

Loose fill media

Ideal for HVAC, cleanroom & industrial applications



KEY FACTS

- Pelletized molecular filtration media
- Various options designed to target specific contaminants
- Effective adsorption and chemical conversion of gaseous molecular air contaminants, solvents, chemicals and biological odors
- Ideal for use in refillable deep-bed gas adsorption and chemisorption installations

DESIGN

Gas-phase filtration media formed into pellets.

APPLICATIONS

Suitable for use in HVAC systems and industrial process exhaust treatment units (deep bed scrubbers) to solve a wide range of issues relating to molecular contamination. Each standard product has been specifically designed to address issues (e.g. toxic fumes, air pollution, odors, corrosion) caused by individual contaminents.

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Technical Data

Fill type	Packaging	Target gases
Carb	Available in 25 kg bag or 500 kg big bag*	Light to medium air pollution of large molecular VOC, solvents, Cl_2, O_3, (NO_2) fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
Acid	Available in 17.5 kg box or 605 kg big bag*	Light to medium air pollution of VOC, Solvents, Organic and Inorganic Acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), SO_2, NO_2, low-level H_2S, fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
Alkali	Available in 25 kg bag or 550 kg big bag*	Medium air pollution of ammonia (NH_3) organic alkylamines (primary, secondary, tertiary), cyclic and aromatic amines (aniline, phenylenediamine, pyrrolidine, etc.) and similar
Carboxy blend	Available in 18 kg box or 650 kg big bag*	Light to medium air pollution of VOC, solvents, formaldehyde, organic and inorganic acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), SO_2, NO_2, mid-level H_2S, Cl_2, O_3, fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
Oxy	Available in 23 kg box or 800 kg big bag*	Light to medium air pollution of formaldehyde, alcohols, ketones, organic acids, SO_2, mid-level H_2S, mercaptans and other sulfuric compounds and similar
Sulf Chlorine	Available in 18 kg box or 605 big bag*	Light to medium air pollution of organic and inorganic acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), chlorine, SO_2, NO_2, low-level H_2S, including lab fumes, building recirculation air and similar
Radio	Available in 25 kg bag or 500 kg big bag*	Light to medium air pollution of H_2S, biogas, radioisotopes

*Weight of big bag can vary

Carboactiv Cartridge

Cartridge filter

Ideal for HVAC & cleanroom applications

KEY FACTS

Cartridges are widely used for the control of odors, toxic chemicals and corrosive gases in supply air and exhaust air. With our Carboactiv Cartridges you can benefit from:

- Extremely high adsorption capacity
- Easy service
- Contact time between 0.1 – 0.15 seconds
- Good sealing

DESIGN

Galvanized steel, stainless steel and plastic cartridges, which can be filled with a wide variety of activated carbon and mediums.

APPLICATIONS

Suitable for installation in HVAC and industrial process systems to solve a wide range of molecular contamination issues. Each standard products has been designed to target issues caused by specific contaminants.

For example, in industries such as pulp and paper, petrochemical, chemical, steel, wastewater treatment, biogas, laboratory exhaust, automotive, pharma, oil refining, semiconductor, food processing, and many more.

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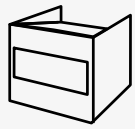
Technical Data

Fiil type	**Material**	**Dimensions** mm	**Flow rate** m^3/h	**Initial pressure drop** Pa	**Target gases**
Carb	Plastic (P)	145 x 453	156	95	Light to medium air pollution of large molecular VOC, solvents, Cl_2, O_3, (NO_2) fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	
Acid	Plastic (P)	145 x 453	156	95	Light to medium air pollution of VOC, Solvents, Organic and Inorganic Acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), SO_2, NO_2, low-level H_2S, fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	
Alkali	Plastic (P)	145 x 453	156	95	Medium air pollution of ammonia (NH_3) organic alkylamines (primary, secondary, tertiary), cyclic and aromatic amines (aniline, phenylenediamine, pyrrolidine, etc.) and similar
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	
Carboxy blend	Plastic (P)	145 x 453	156	95	Light to medium air pollution of VOC, solvents, formaldehyde, organic and inorganic acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), SO_2, NO_2, mid-level H_2S, Cl_2, O_3, fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	
Oxy	Plastic (P)	145 x 453	156	95	Light to medium air pollution of formaldehyde, alcohols, ketones, organic acids, SO_2, mid-level H_2S, mercaptans and other sulfuric compounds and similar
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	
Sulf Chlorine	Plastic (P)	145 x 453	156	95	Light to medium air pollution of organic and inorganic acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), chlorine, SO_2, NO_2, low-level H_2S, including lab fumes, building recirculation air and similar
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	
Radio	Plastic (P)	145 x 453	156	95	Light to medium air pollution of H_2S, biogas, radioisotopes
		145 x 600	200	125	
	Galvanized steel (G)	145 x 453	156	95	
		145 x 600	200	125	
	Stainless steel (S)	145 x 453	156	95	
		145 x 600	200	125	

Carboactiv Module



Filter module

Ideal for HVAC & cleanroom applications

KEY FACTS

Modules are widely used for the control of odors, toxic chemicals and corrosive gases in supply air and exhaust air. With our Carboactiv Modules you can benefit from:

- Extremely high adsorption capacity
- Easy service
- Contact time between 0.06 – 0.12 seconds

DESIGN

V-shaped plastic module, which can be filled with a wide variety of activated carbon and mediums.

APPLICATIONS

Suitable for installation in HVAC and industrial process systems to solve a wide range of molecular contamination issues. Each standard products has been designed to target issues caused by specific contaminants.

For example, in industries such as pulp and paper, petrochemical, chemical, steel, wastewater treatment, biogas, laboratory exhaust, automotive, pharma, oil refining, semiconductor, food processing, and many more.

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Technical Data

Fiil type	**Dimensions*** mm	**Flow rate*** m^3/h	**Initial pressure drop*** Pa	**Target gases**
Carb	305 x 610 x 305	850	130	Light to medium air pollution of large molecular VOC, solvents, Cl_2, O_3, (NO_2) fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
	153 x 610 x 457	850	130	
Acid	305 x 610 x 305	850	130	Light to medium air pollution of VOC, Solvents, Organic and Inorganic Acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), SO_2, NO_2, low-level H_2S, fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
	153 x 610 x 457	850	130	
Alkali	305 x 610 x 305	850	130	Medium air pollution of ammonia (NH_3) organic alkylamines (primary, secondary, tertiary), cyclic and aromatic amines (aniline, phenylenediamine, pyrrolidine, etc.) and similar
	153 x 610 x 457	850	130	
Carboxy blend	305 x 610 x 305	850	130	Light to medium air pollution of VOC, solvents, formaldehyde, organic and inorganic acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), SO_2, NO_2, mid-level H_2S, Cl_2, O_3, fragrances, kitchen exhaust, lab fumes, building recirculation air and similar
	153 x 610 x 457	850	130	
Oxy	305 x 610 x 305	850	130	Light to medium air pollution of formaldehyde, alcohols, ketones, organic acids, SO_2, mid-level H_2S, mercaptans and other sulfuric compounds and similar
	153 x 610 x 457	850	130	
Sulf Chlorine	305 x 610 x 305	850	130	Light to medium air pollution of organic and inorganic acids (HF, HCl, HBr, HNO_3, H_2SO_4, HCN, etc.), chlorine, SO_2, NO_2, low-level H_2S, including lab fumes, building recirculation air and similar
	153 x 610 x 457	850	130	
Radio	305 x 610 x 305	850	130	Light to medium air pollution of H_2S, biogas, radioisotopes
	153 x 610 x 457	850	130	

*Values refer to a set of 2 modules

Carboactiv Drum

Drum scrubber

Ideal for HVAC & cleanroom applications

KEY FACTS

- Simple design ensures easy installation and operation
- Provides longer contact times to remove high AMC concentrations and strong odours
- Suitable for any type of carbon or chemical media (see *Carboactiv Fill* – page 4)
- Made of HDPE (high density polyethylene) – highly resistant against acid gases
- Special versions for mobile applications available upon request (fixation on pallet or wheels etc.)

DESIGN

A rigid and robust HDPE (high density polyethylene) casing provides resistance against acid gases. Inside, an activated carbon media is available in various types and impregnation options.

An Ojop® toggle latch provides secure but easy access for emptying and refilling. Options such as a Carboactiv Drum Fan, manhole for easy service, and demister to protect from moisture droplets are available upon request.

APPLICATIONS

Designed for use in a wide range of industries such as pulp and paper, petrochemical, chemical, steel, wastewater treatment, biogas, laboratory exhaust, automotive, pharma, oil refining, semiconductor, food processing, and many more.

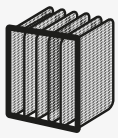
Technical Data

Size	**Dimensions** mm	**Flow rate** m^3/h	**Initial pressure drop** Pa	**Face velocity** m/s	**Media volume** l	**Media height** mm	**Inlet and outlet Ø** mm
Small	570 x 915	250	600	0.3	140	549	160
Medium	790 x 1220	510	700	0.3	280	571	160
Large	915 x 1120	850	950	0.4	480	724	160
Extra Large	1325 x 1525	1700	1000	0.3	1100	792	250

Options

Size	**Carboactiv Drum fan**	**Manhole**	**Demister**
Small	Optional	Optional	Optional
Medium	Optional	Optional	Optional
Large	Optional	Standard	Optional
Extra Large	Optional	Standard	Optional

Carboactiv Bag Duosorb Select



Bag/pocket filter

Select

Mid-range product

Ideal for HVAC & cleanroom applications

ePM1

Filter class to ISO 16890

KEY FACTS

- Particle filtration and gas adsorption in one filter element
- Improvement of indoor air quality
- Ideal for eliminating odors
- Low pressure drop

DESIGN

Multi-layered media, tailored-sewn into pockets with sealed, conical spacer seams for an optimal V-shape. A galvanized steel frame provides rigidity.

APPLICATIONS

For use in public buildings or other places where people gather to improve indoor air quality and protect against sick building syndrome.

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Technical Data

Efficiency class ISO 16890	**Efficiency class** EN 779	**Dimensions** mm	**Pockets** no.	**Flow rate** m^3/h	**Initial pressure drop** Pa
ePM1 60%	F7	287 x 592 x 600	4	1650	140
ePM1 60%	F7	287 x 592 x 600	5	1650	140
ePM1 60%	F7	287 x 892 x 600	4	2475	140
ePM1 60%	F7	287 x 892 x 600	5	2475	140
ePM1 60%	F7	490 x 592 x 600	6	2825	140
ePM1 60%	F7	490 x 592 x 600	8	2825	140
ePM1 60%	F7	592 x 287 x 600	8	1650	140
ePM1 60%	F7	592 x 287 x 600	10	1650	140
ePM1 60%	F7	592 x 490 x 600	8	2825	140
ePM1 60%	F7	592 x 490 x 600	10	2825	140
ePM1 60%	F7	592 x 592 x 600	8	3400	140
ePM1 60%	F7	592 x 592 x 600	10	3400	140
ePM1 60%	F7	592 x 892 x 600	8	5125	140
ePM1 60%	F7	592 x 892 x 600	10	5100	140

Specification

Heat resistance	< 30 °C (Peak 50 °C)
Regenerable	No
Incinerable	No
Rec. final pressure for efficient energy use acc. to EN 13053	Lowest value of initial pressure drop + 100 Pa, or initial pressure drop x 3
Moisture resistance	< 60 % (Max. < 90 %)

Options

Gasket	Flat gasket, 1 or 2 sides

Carboactiv Bag Duosorb Eco

Bag/pocket filter

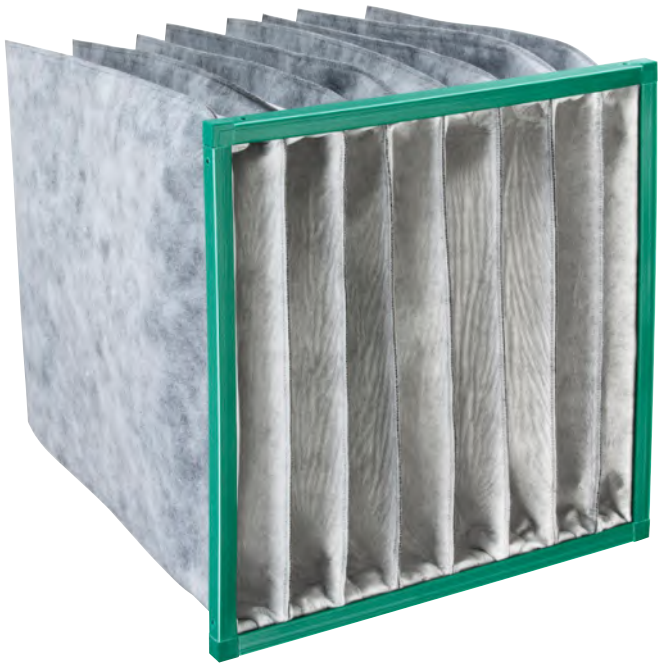
Eco

Mid-range product

Ideal for HVAC, cleanroom & industrial applications

ePM10

Filter class to ISO 16890



KEY FACTS

- Particle filtration and gas adsorption in one filter element
- Improvement of indoor air quality
- Ideal for eliminating odors
- Low pressure drop

DESIGN

Multi-layered synthetic and carbon media sewn together to form pockets and assembled in a robust frame.

APPLICATIONS

For use in public buildings or other places where people gather to improve indoor air quality and protect against sick building syndrome.

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Technical Data

Efficiency class ISO 16890	**Efficiency class** EN 779	**Dimensions** mm	**Pockets** no.	**Flow rate** m³/h	**Initial pressure drop** Pa
ePM10 75%	M6	592 x 592 x 635	8	3400	70

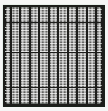
Specification

Heat resistance	< 30 °C (Peak 50 °C)
Regenerable	No
Incinerable	No
Rec. final pressure for efficient energy use acc. to EN 13053	Lowest value of initial pressure drop + 100 Pa, or initial pressure drop x 3
Moisture resistance	< 60 % (Max. < 90 %)

Options

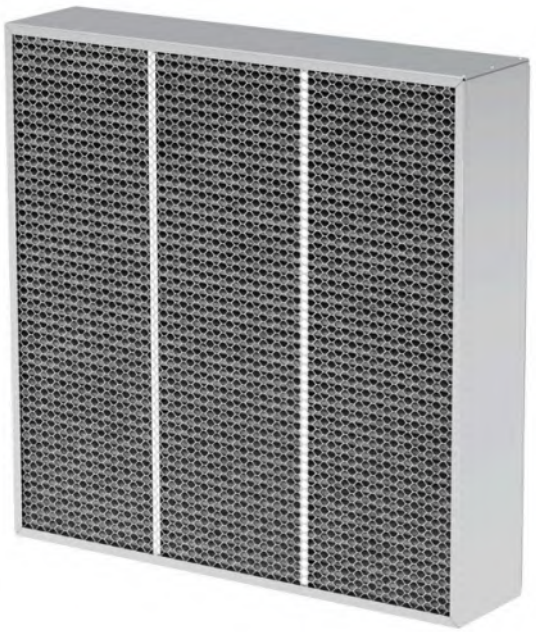
Gasket	Flat gasket, 1 or 2 sides

Carboactiv Panel FFU



Panel filter

Ideal for cleanroom applications



KEY FACTS

- Filter panels for clean room ceilings, Filter Fan Units, mini-environments or process equipment
- Low outgassing
- High media cleanliness
- Efficient against typical contaminants like acids, bases, condensables, dopants (acc. to SEMI F21-1016), refractories, VOCs, ozone and odors
- Various dimensions and media combinations possible

DESIGN

An anodized aluminum frame combines rigidity with a light weight. A rib mesh grid protects the internal pleated media from damage.

APPLICATIONS

Designed for use in a wide range of industries such as electronics and optics, semiconductor, battery manufacturing, pharmaceutical, and many more.

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Technical Data

	Dimensions mm	**@ Face velocity (per FFU) 0.45 m/s**		**@ Face velocity (per FFU) 0.3 m/s**	
		Flow rate m^3/h	**Initial pressure drop** Pa	**Flow rate** m^3/h	**Initial pressure drop** Pa
ABCD	740 x 740 x 165	2220	≤63	1480	≤35
	490 x 490 x 165	1080	≤73	720	≤41
	370 x 440 x 165	525	≤45	350	≤26
	305 x 370 x 165	525	≤78	350	≤43
AB / CD / ACD / B	740 x 740 x 86	2220	≤38	1480	≤21
	490 x 490 x 86	1080	≤45	720	≤25
	370 x 440 x 86	525	≤27	350	≤16
	305 x 370 x 86	525	≤47	350	≤26

KEY according to AMC classification to SEMI F21-1016

- **A** **Acids:** SO_X, HCl, HF, etc.
- **B** **Bases:** NH_3, amines, NMP, etc.
- **C** **Condensables:** > 150°C boiling point
- **D** **Dopants:** arsenic boron, phosphorous, etc.

Specification

Recommended relative humidity	≥ 40 %
Recommended operating temperature	≤ 40 °C
Gasket	Downstream

Carboactiv Cube

Compact filter

Ideal for HVAC, cleanroom & industrial applications

ePM1

Filter class to ISO 16890

KEY FACTS

- Compact filter with molecular-filtration media
- Removes odors and captures harmful gases
- Various product types to target issues caused by specific contaminants
- High structural stability
- Activated carbon for high spontaneity of adsorption/ reaction
- Particle filtration and gas adsorption in one filter element
- Low pressure drop
- Retro-fit possible

DESIGN

Filter elements are sealed into a 4V plastic frame with polyolefins for an extremely robust construction. The pleat packs are made of a composite material based on fine-grain absorbents embedded into a synthetic textile matrix. The frame features an integrated handle for ease of transportation.

APPLICATIONS

Suitable for installation in HVAC systems to solve a wide range of molecular contamination issues – particularly in locations with problem odors or gaseous compounds. E.g. hospitals, F&B, waste plants, airports, commercial buildings, cruise ships, education, electronics and optics, and public buildings.

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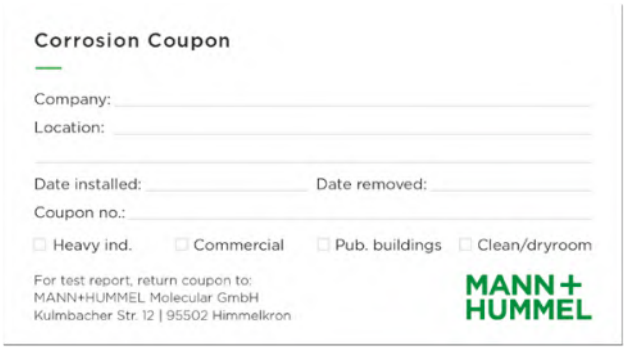
Technical Data

	Dimensions mm	**Flow rate** m^3/h	**Initial pressure drop** Pa	**Filter class** ISO16890	**Toluene** ISO10121-3	**O_3** ISO10121-3	**NO_2** ISO10121-3	**SO_2** ISO10121-3
Carb	592 x 592 x 292	3400	≤ 50	ePM10 55%	LD 85 / MD 80	MD 85 / HD 75	LD 80	LD 60
	592 x 490 x 292	2800						
	592 x 287 x 292	1700						
Duosorb	592 x 592 x 292	3400	≤ 98	ePM1 80%	LD95 / MD 90	MD 90 / HD 85	LD 85 / MD 65	LD 75
	592 x 490 x 292	2800						
	592 x 287 x 292	1700						
Acid	592 x 592 x 292	3400	≤ 50	n/a	LD 95 / MD 90	MD 90 / HD 85	LD 80 / MD 70	LD 75 / MD 60
	592 x 490 x 292	2800						
	592 x 287 x 292	1700						
Comfort	592 x 592 x 292	3400	≤ 50	n/a	LD 85 / MD 75	MD 80 / HD 75	LD 85 / MD 65	LD 65
	592 x 490 x 292	2800						
	592 x 287 x 292	1700						

Carboactiv Corrosion Coupon

Air monitoring

Ideal for HVAC, cleanroom & industrial applications



KEY FACTS

- Copper and silver-based coupons
- Identify and measure sources of corrosion on electrical and electronic components according to ISA71.04
- Help protect expensive equipment from corrosion, and reduce associated downtime and outages

DESIGN

Copper and silver-based corrosion coupons, constructed to meet the requirements of ISA71.04/ASHRAE TC9.

APPLICATIONS

Suitable for use in HVAC systems and industrial process exhaust treatment units to help tackle a wide range of issues caused by gaseous molecular contamination.

Carboactiv Corrosion Coupon identifies and measures corrosive contaminants in an internal environment, so that the filtration system or other corrective steps can be targeted at those specific contaminants and sources e.g. toxic and corrosive fumes, agriculture, air pollution, traffic, ambient heating and other polluting processes.

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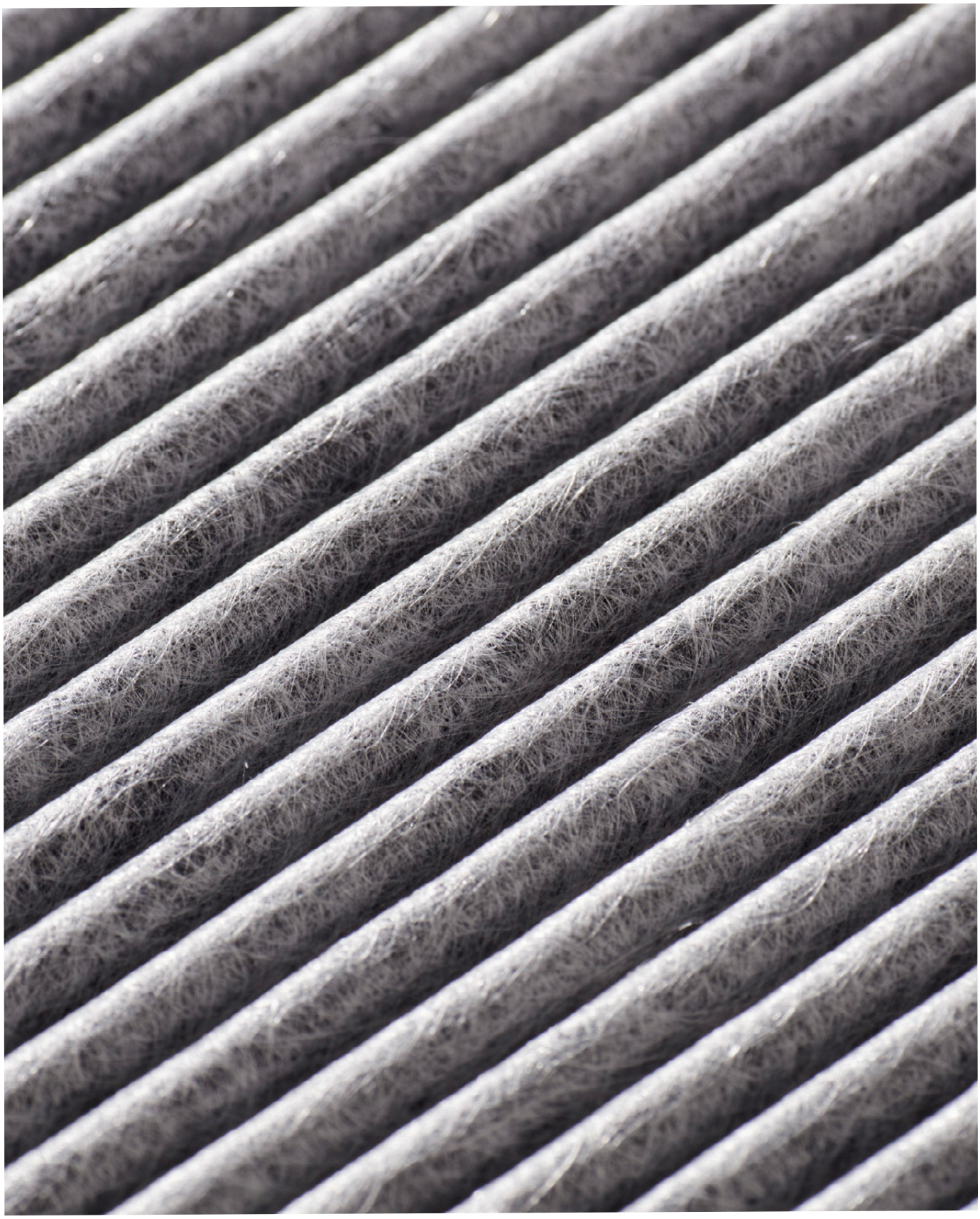
Above: Carboactiv Corrosion Coupons show the level of corrosive compounds in the air.

How it works

Carboactiv Corrosion Coupons are installed at your location to detect the level and nature of corrosive contaminants in your operating environment.

After one-to-four months, simply complete the accompanying form and send the coupons back to us. We will then analyze the coupons in our laboratory to determine the level of corrosive substances in your building. This enables us to identify the ideal filtration solution to meet the specific challenges that you are facing.

The data also allows us to maximize the service life of the filters to ensure that you are receiving the best possible value, as well as the most appropriate products,



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