



*MAKE  
YOUR  
PROCESS  
SAFELY*

***SAFE***



*SAFE Filtration and  
Separation Technology*

*Safe Air Flow Engineering®*

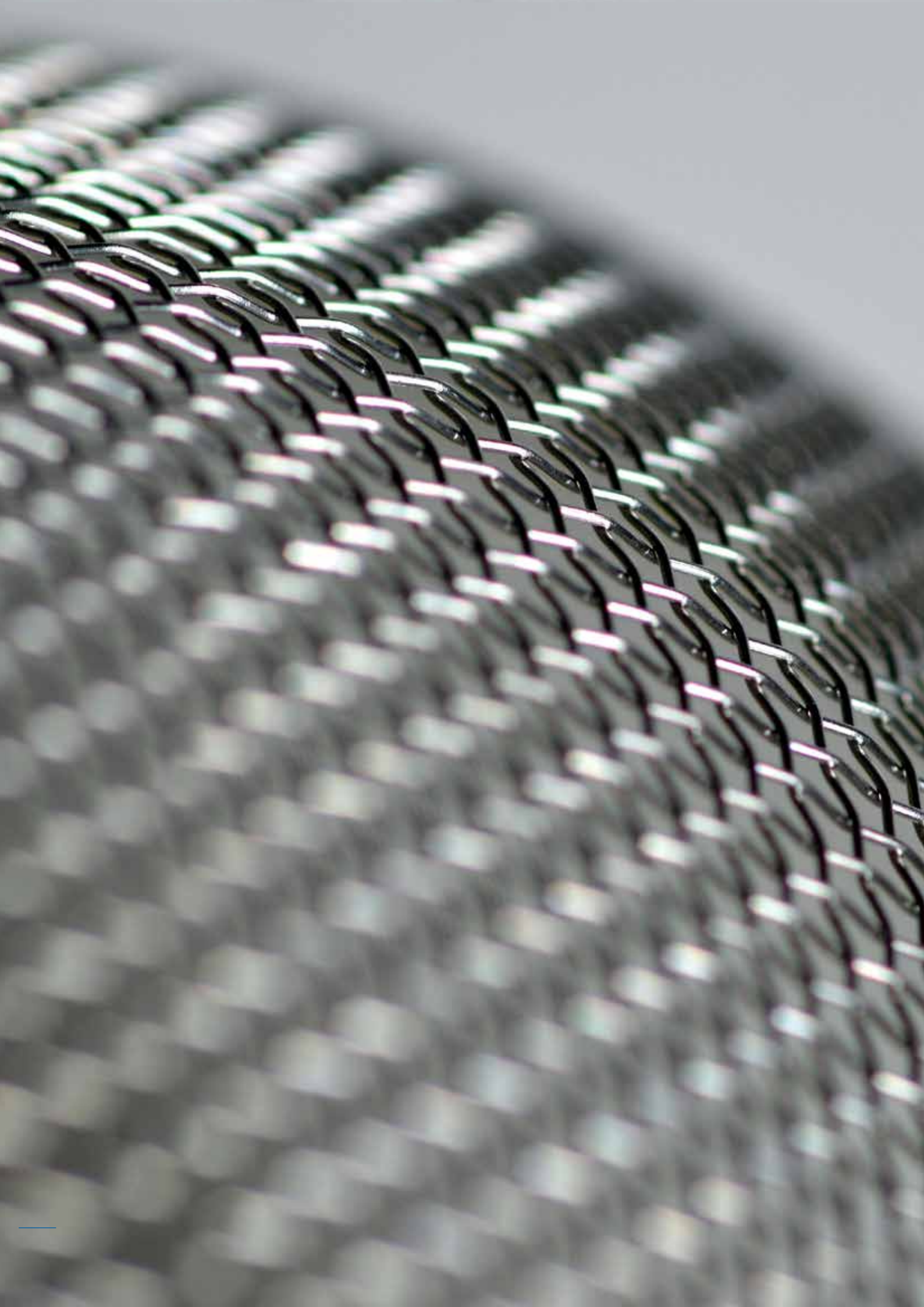














# Microfilter and water separator



## Excellent Series Compressed Air Filters

### Coalescing Filters



Coalescing Filters are probably the most important items of purification requirements in a compressed air system, which are designed not only to filter oil vapor and water, but also to filter solid particulates to an acceptable level as small as 0.01 micron in size.

Usually, in the installation system, the first filter's purpose is to pre-filter, protect the high efficiency filters from bulk contamination so as to provide high quality compressed air. If the air filters worked under damp or full of water adsorption condition, it would prevent the compressed air from getting through the filter element, and the air flow would force the liquid to get through from the pores of the element media, thus increase working pressure drop and reduce filtration performance.

### Activated Carbon Filters

Oil vapor can easily get through the coalescing filters in a state of gaseous, so the adsorptive filter must provide large activated carbon adsorption bed. Because the damp air will reduce the adsorptive ability of the activated carbon, the adsorptive filter usually installed after the adsorptive dryer, in order to guarantee effective removal of oil vapor and peculiar odor. It's not used to remove the liquid oil or aerosols, thus poor maintenance and lack of pre-filter will accelerate its invalidation.

- The filter housing is aluminium alloy die-casting, with tight and strong structure, has long life span. All the housing painted before cleaning, degreasing and special anti-corrosion treatment, which enhanced its durability.
- Smaller and compact filter due to the advance filter element designing idea.
- The filter housing's service life is 15 years, and the filter element can be used for 6000~8000 hours.
  - Under working environment from temperature  $1.5\sim 80^{\circ}\text{C}$ , pressure is under 1.6 Mpa, also applicable to ocean platform operation.
  - The housing can bear pressure 32 kg.f for 96 hours, and the maximum burst pressure is 90 kg.f.
  - Precise screw thread makes installation easier, and parallel connection of the housing can save installation and maintenance space.









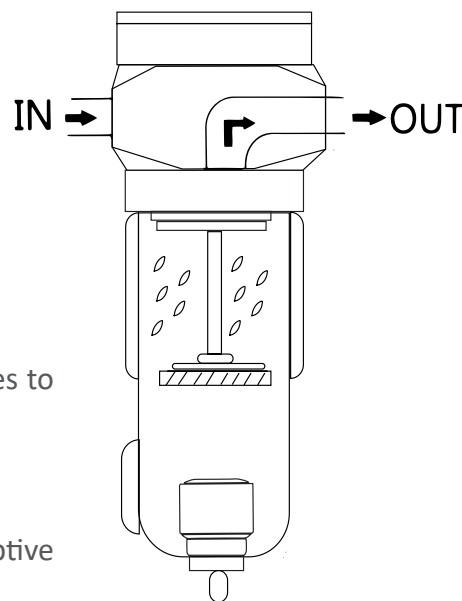
## Excellent Series Water Separator

### Existing Problems:

Compressed air system have bulk liquid which bring pipeline corrosion, the damages of valves, air cylinder and tools, reduce the efficiency of air cooler and heat exchanger.

### Installing Benefits:

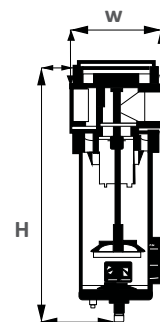
- Reduce the corrosion of the pipeline and damages to valves, air cylinders.
- Protect the filter form bulk liquid contamination.
- Improve air quality.
- Protect the pre-filter of frozen dryer and adsorptive dryer.
- Remove effectively the liquid in all fluids.
- Cut down the operational and maintenance costs.



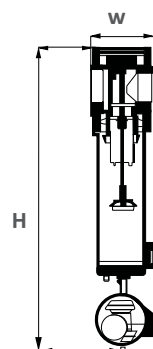
## Production Selection

The flow rate below is the treatment capacity of compressed air under nominal working pressure 7 barg (100 psig). Under normal working condition, its separation effect is as high as 99%.

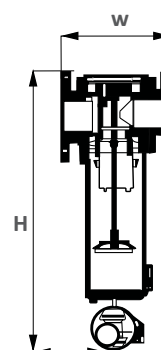
MODEL	Pipe size	Flow rates			Qty	Dimension (mm)	
		l/s	m³/min	cfm		width(w)	Height(H)
WS 15	Rc1/2"	40	2.4	84.5	1	89	228
WS 25	Rc3/4"	60	3.6	127.1	1	89	228
WS 50	Rc1"	75	4.5	158.9	1	89	263
WS 75	Rc1"	125	7.5	264.8	1	120	335
WS 100	Rc1/2"	166.7	10.0	353.1	1	120	335
WS 200	Rc2"	300.1	18.0	635.6	1	164	564
WS 250	Rc2 1/2"	416.8	25.0	882.8	1	164	664
WS 700	Rc2 1/2"	700	42.0	1483.1	1	200	712
WS 800	Rc3"	833.5	50.0	1765.6	1	200	712
WS 800F	DN80/DN100	833.5	50.0	1765.6	1	280	734/744
WS 1000F	DN100/DN125	1000.2	60.0	2118.7	1	280	780/795
WS 1200F	DN100/DN125	1166.7	70.0	2464.0	1	280	1058/1073



WS 15 -100



WS 250-800



WS 800F-1200F

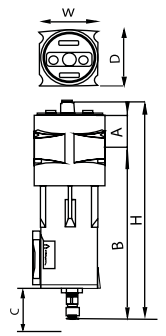


## Production Selection

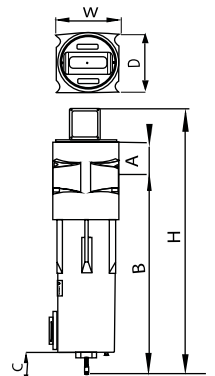
Below flows are for operation at 7 barg (100psig) with reference to 20 °C. For other pressure, please refer to the correction factors.

Model	Pipe Size	Flow rate			NO.	Dimension (mm)					
		l/s	m³/min	cfm		Width(w)	Depth (D)	Heigh (H)	A	B	C
YD017	Rc1/2"	16.7	1.0	35.3	1	89	79	246	40	186	118
YD025	Rc3/4"	25.0	1.5	53.0	1	89	79	246	40	186	118
YD030	Rc1/2"	30.0	1.8	63.6	1	89	79	280	40	220	158
YD035	Rc3/4"	33.3	2.0	70.6	1	89	79	280	40	220	158
YD040	Rc3/4"	40.0	2.4	84.7	1	120	110	377	55	276	195
YD058	Rc1"	46.7	2.8	98.9	1	120	110	377	55	276	195
YD068	Rc1-2"	60.0	3.6	127.1	1	120	110	377	55	276	195
YD080	Rc1"	80.0	4.8	169.5	1	120	110	477	55	377	290
YD145	Rc1-1/2"	120.0	7.2	254.2	1	120	110	477	55	377	290
YD220	Rc2"	200.0	12.0	423.7	1	162	151	676	64	566	480
YD260	Rc2-1/2"	233.3	14.0	494.4	1	162	151	676	64	566	480
YD330	Rc2"	316.7	19.0	670.9	1	162	151	984	64	875	780
YD360	Rc2-1/2"	366.7	22.0	776.8	1	162	151	984	64	875	780
YD405	Rc2-1/2"	430.0	25.8	911.0	1	200	189	757	78	634	560
YD430	Rc3"	550.0	33.0	1165.3	1	200	189	757	78	634	560
YD620	Rc3"	620.0	37.2	1313.6	1	200	189	1012	78	889	780

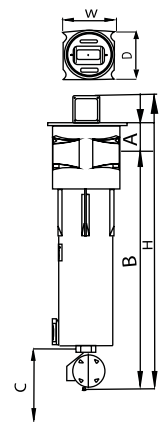
Pressure	Barg	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Psig	15	29	44	59	73	87	100	116	131	145	160	174	189	203	218	232
Correction Factor		0.38	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.19	1.23	1.31	1.36	1.41	1.46	1.51



YD017-YD040



YD058-YD145



YD220-YD620

## Filtration performance

Filtration Grade	Filter Type	Particle removal/ Water&Oil aerosols	Remaining oil content at 21 C (70 F) aerosols	Change every	Precede with filtration grade
WS	Bulk Liquid	N/A	N/A	N/A	N/A
PF	Coalescing	5 Um	N/A	8000 hrs	WS
AO	Coalescing	1 Um	0.6 mg/m³ 0.6 ppm	8000 hrs	PF
AA	Coalescing	0.01 Um	0.01 mg/m³ 0.01 ppm	8000 hrs	AO
AX	Coalescing	0.01 Um	0.001 mg/m³ 0.001 ppm	8000 hrs	AA
ACS	Oil Vapour	N/A	0.003 mg/m³ 0.003 ppm	when oil vapour or odour is detected	AA
AR	Dry Particulate	1 Um	N/A	8000 hrs	N/A
AAR	Dry Particulate	0.01 Um	N/A	8000 hrs	N/A



## Differential pressure indicators & Differential pressure gauges

The filter housing are fitted with “Differential pressure indicators/gauges.” Generally, they are indicators, not precise gauges which can offer correction help or accuracy. Normally there are green and red area, if the needle is in the green air, it means no need to change the element. Differential pressure indicators/gauges are neither filter service indicators nor air quality indicators, they can only simply measure the pressure difference and show a premature blockage of the filter element.



## Manual & Automatic drain

The integrated manual and automatic design has largely improved the drainage performance and prevents the filter element from being polluted by large liquid. The flexible pipeline at the bottom provides more connection ways.





## High Quality Compressed Air Filter Accessories

### Working Principle:



Drains are designed with float ball drain system. The outlet of the drain will close and stop draining if the draining buoyance is smaller than the float ball's weight and the pressure from the compressed air. It will have a trickle of drainage if the float weight and pressure are balanced. It will open and start draining if the draining buoyance is greater than the float ball's weight and the pressure from the compressed air. It works cyclically according to the buoyance.



The drain housings are made of first-class aluminium alloy materials through die-casting technology, strong and tight, surface is plastic-sprayed, can resist corrosion by synthetic lubricants of air compressor. Easy to install and clean, no noise and compressed air loss, running safely. Better to clean drain bodies weekly to guarantee better drainage effect and less blockage. Originated from the automatic draining design of the freestyle float ball, SAFE drains are free from electricity, safe, low carbon, environment friendly and really help our end users save costs.

### Liquid mirror/sight glass

Made from imported high temperature-resistant and low temperature-resistant material which are used to monitor the liquid level and take precautions against any premature blockage of the drain, so as to remind maintenance in advance and to protect the downstream equipment from contamination.







# Celever Series Compressed Air Filters

## Features

The air filters have four (4) ranges of efficiencies, removing contaminants as small as 0.01 micron at up to 235psi (16barg)-1/4" to 3" NPT/BSP pipe sizes. A protected auto float drain (2 mm orifice) is standard for optimal and reliable removal of liquid contaminants.

These air filters have zero-porosity aluminum and durable epoxy powder-coat finish, along with a corrosion resistant internal coating for along servicelife. Filter combinations are configured to meet specific applications requirement.

Filter comply with PED and perform as per related ISO 8573 standards.

These filters maybe equipped with differential pressure gauges for easy maintenance and energy efficiency. SAFE compressed air filters are always recommended with this system.



Differential pressure gauge

## Element Features

SAFE offers superior protection from 1 micron to 0.01 micron.

Durable element construction and efficient drain layer ensures continued performance after optimal element change. Elements are also easy to replace with the head clips.



SAFE elements have been designed for easy handling



To remove the element twist clockwise



# Mechanism and Features

## Head Clamping

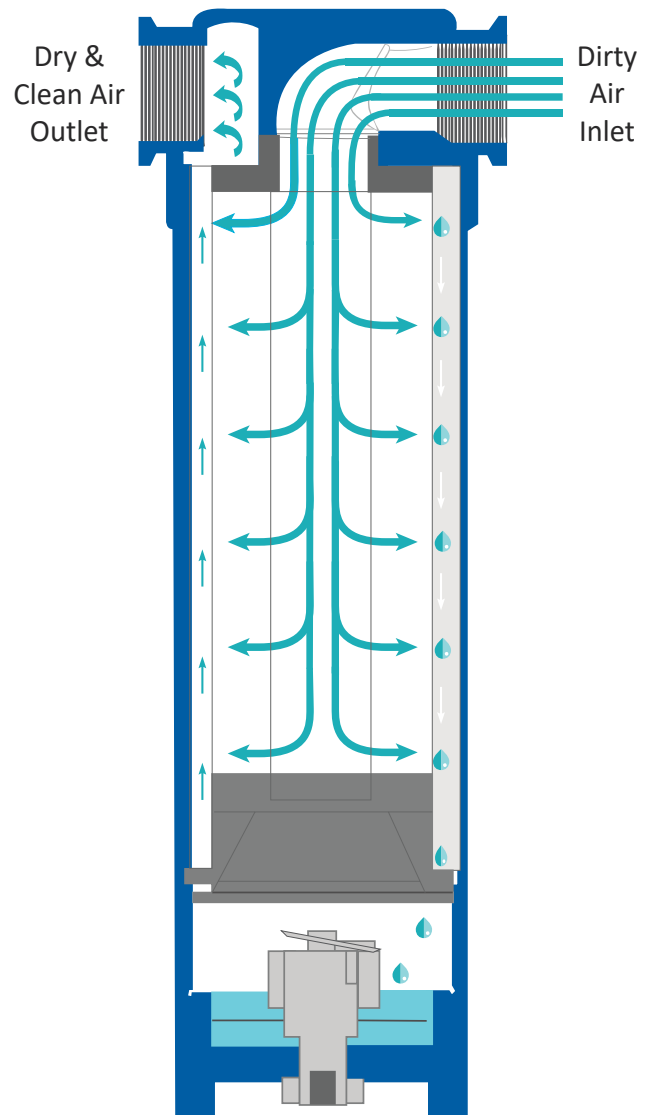
Head Clamping provides serial connection of filters without any extra piping.

## Draining Ribs

Drainage Ribs Favors the humidity flow.

## Zero Clearance

A major innovation for end user is the zero clearance design provide for an easier bowl removal without using tool.



- 1- Deep pleating also enables a lower pressure drop
- 2- Supreme collapse resistance due to usage of fluted stainless tube provides strength against pressure drops while improving the performance by passing air diagonally through the elements
- 3- PVC impregnated foam favours Water/Oil drainage

## Anodising

Anodising provides supreme corrosion resistance. Anodised surface treatment is proven to be better than other surface treatment methods such as Alocrome coating. Contact SAFE to get comparison test results between competitor filters with Alocrome coating and Safe filter with Anodising treatment.

Without anodising



With anodising



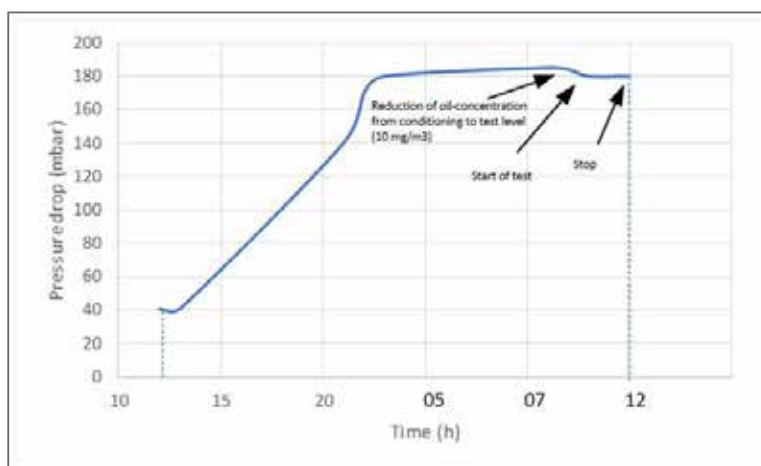


## Test Reports

### Independent Test Report as Per ISO 12500-1

Filter element	M50Y		
Element	002		
Standard parameters and measuring results			
Measuring parameters	Unit	Standard	Test
Calendar date of test			28./29.09.10
Inlet temperature	°C	20±5	18,5±0,5
Intel pressure	bar(e)	7	7
Ambient temperature	°C	20±5	17,5±0,5
Intel dew point	°C	≤10°C	0-4
Main flow through the test filter	m³/h		50
Partial flow	m³/h		5,1
Time of conditioning	h		20,38
Measuring time	h		2,75
Inlet oil concentration at conditioning	mg/		23±1
Inlet oil concentration at test	mg/m³	10±10%	10±10%
Residual oil concentration	mg/m³		0,01
Pressure drop filter element	mbar		183
Remarks			mouth of probe oil-free
Test caried out by			
Signature			

### SAFE M50Y-2 at 50 m³/h ANR - 7 bar(e) 28.-29.09.10



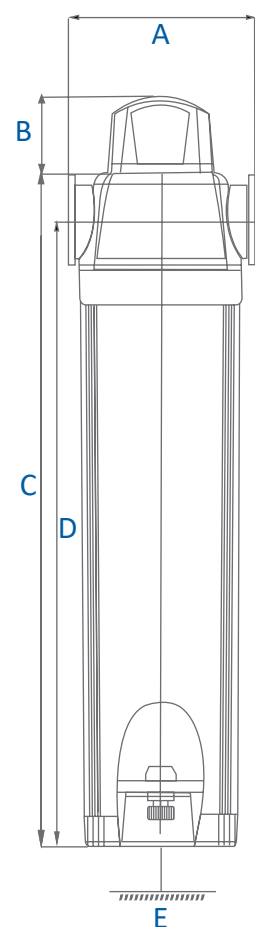




## Technical Specifications

Model	Connection Size			Flow Rate		Max. Working Pressure (bar)	Element Model	Housing Dimensions (mm)				
				(m <sup>3</sup> /h)	(scfm)			A	B	C	D	E
GO20	-	1/4"	-	20	12	20	MO20	75	45	193	175	7
GO40	-	3/8"	-	40	24	20	MO40	75	45	193	175	7
GO25	1/4"	3/8"	1/2"	25	15	20	MO25	102	45	214.5	192.5	7
GO50	1/4"	3/8"	1/2"	50	30	20	MO50	102	45	214.5	192.5	7
GO100	3/8"	1/2"	-	100	58	20	MO100	102	45	252.5	230.5	7
GO150	1/2"	3/4"	1"	150	88	20	MO150	123	45	297.5	270.5	8
GO200	3/4"	1"	-	200	117	20	MO200	123	45	361.5	334.5	8
GO250	3/4"	1"	-	250	147	20	MO250	123	45	401.5	374.5	8
GO300	1"	1 1/4"	1 1/2"	300	176	20	MO300	123	45	458	422.5	8
GO500	1 1/4"	1 1/2"	-	500	294	20	MO500	123	45	488	452.5	8
GO600	1 1/4"	1 1/2"	-	600	353	20	MO600	123	45	533	497.5	9
GO851	1 1/4"	1 1/2"	2"	851	500	20	MO851	160	45	622.5	581	9
GO1210	2"	-	-	1210	712	20	MO1210	160	45	692.5	651	9
GO1520	2"	2 1/2"	3"	1520	930	20	MO1520	194	45	725.5	669	10
GO1820	2 1/2"	3"	-	1820	1140	20	MO1820	194	45	865	808	10
GO2220	3"	-	-	2220	1380	20	MO2220	194	45	919.5	863	11
GO2700	3"	-	-	2700	1541	20	MO2700	194	45	1063.5	1007	11

Specifications	Pre Filtering	General Purpose	Oil Removal	Activated Carbon	Indicator Type
Grade	P	X	Y	A	Gauge with or without electrical contact
Particle Removal (Micron)	5	1	0.01	0.01	
Max. Oil Carryover at 21°C ( mg/m <sup>3</sup> )	5	0.5	0.01	0.003	Drain Type
Max. Working Temperature (°C)	80	80	80	25	
Initial Pressure Loss (mbar)	40	80	100	80	Electro-Adjustable
Pressure Loss for Element Change (mbar)	700	700	700	700	External Float Type
Element Color Mode	White	White	White	METAL SS	Zero-Loss Drain
					Manual



## Correction Factor

Operating Pressure (barg)	1	3	5	7	9	11	13	15	16
PSIG	15	44	73	100	131	160	189	218	247
Correction Factor	0.5	0.71	0.87	1	1.12	1.22	1.32	1.44	1.57

For maximum flow rate, multiply model flow rate show in the above table by the correction factor corresponding to the working pressure.

## Notes

- Grade A must not operate in oil saturated conditions.
- Grade A elements should be replaced periodically to suit the applications but must be changed at least every six months.
- Grade A will not remove certain gases including carbon monoxide and carbon dioxide. Please refer to works if in doubt.
- Flow rates are based on a 7 bar operating pressure, for flows at other pressures use correction factor given above.
- All filters are suitable for use with mineral and synthetic oils.
- Gauge type pressure indicators are fitted to models GO25 to GO2700 as standard.
- All filters are in conformity with the Pressure Equipment Directive (97/23/EC).

## Ordering

The complete filter model number contains the size and grade, example - 1" general purpose filter model GO250MX with replacement filter element model MO250X. 250 represent 250 m<sup>3</sup>/h capacity and X represents the general purpose element.





A close-up, low-angle shot of a large industrial fan or turbine. The image shows the curved blades of the fan, which are arranged in a circular pattern around a central hub. The blades have a textured, wavy surface. The lighting is bright, creating strong highlights and shadows that emphasize the metallic texture and the curved geometry of the components. A semi-transparent blue horizontal band is overlaid across the middle of the image, containing the text "SAFE AIR DRYER" in white, uppercase letters.

# SAFE AIR DRYER





## Refrigeration Air Compressor

The most complete range of hermetic compressors for every commercial application under the Cubigel Compressor® brand.

The offer includes different models of compressors from ranges of 0.9 m³/min to 140 m³/min, in most refrigerant Gases (R134a & R407c or R404a), main voltages and types of applications.



## Various Hardware Small

- Water Separator
- Inlet Filter 1 micron dust, 0,5 mg/m³ oil
- Heat Exchanger Water concent: 6 mg/m³

## Simple Inlet and Outlet Filter

Inlet and outlet filters and heat exchanger on the

same line up till C-8500 model.

\*Outlet pressurized air quality ISO 8573-1; 2010

- Oil Class:1 0,01 mg/m³
- Dust Class:1 0,1 micron
- Water Class:4 6 g/m³



## Heater Exchanger

A design which has no welded parts with the feature of easy assembly and disassembly. It uses ambient temperature for pre-refrigeration of incoming hot air. Efficient heat transfer with aluminium panel fins, a design which is not affected by the problems which arise from freezing at low temperatures.

## Intelligent Control System

- Display of pressure dew point through a clear scale
- Sound and light alarm output for problems in the compressed air refrigeration dryer
- Quick identification of the affected component
- Trouble-shooting overview in the manual enables a direct debugging in most cases
- Manual condensate discharge by pressing the on/off button twice
- Integrated signal output for external alarm (12 V DC signal)

## Low Pressure Drop with Design Options

Pressure Drop	T. max. = 0,1 ~ 0,2 bar (g) (at 3 °C Pressure Dewpoint)
SAFE 0	Series Standard Design
SAFE 1	Efficiency M6-F7-F8-F9 - glass fiber media- aluminium separator - metal frame - 250 °C HT series
SAFE 2	Series High Inlet Temperature (+70 °C) Design
SAFE 3	Series High Operating Pressures 50 bar (g)







# Correction Factors

## Reference Conditions

Operating Pressure : 7 bar (100psi)  
 Operating temperatures : 35°C / 95°F  
 Room Temperature : 25°C / 77°F  
 Pressure Dew point : +3°C + / -1 / 37, 4°F

\* Available in different voltages and frequency

## Limit Conditions

Max. Operating Pressure : 60°C / 140°F  
 Max. Operating Temperature : 60°C / 140°F  
 Min. Room Temperature : +5°C / 41°F  
 Max. Room Temperature : +50°C / 122°F

\*Please Check Correction Factors

## Formula

Real Flow Rate

Nominal Flow Rate

$FE \times FOS \times AG \times FCI$

### correction factors for different operating pressures

bar	5	6	7	8	9	10	11	12	13	14	15	
FE :1	0.9	0.96	1.0	1.04	1.06	1.09	1.10	1.20	1.24	1.31	1.39	1.48

### correction factors for different ambient tempretures

° C	20	25	30	35	40	45	50
FOS: 1	1.05	1.0	0.98	0.93	0.84	0.76	0.7

### correction factors for different in let air tempretures

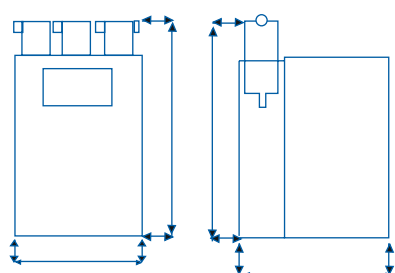
° C	30	35	40	45	50	55	60
AG:1	1.29	1.0	0.92	0.78	0.65	0.65	0.45

### correction factors for different dew point tempretures

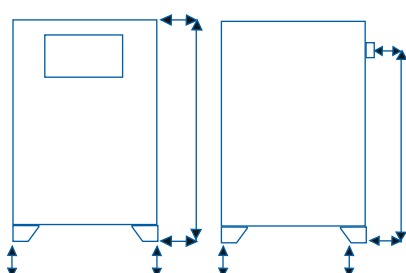
° C	2	3	6	8	10
FCi:1	0.8	1.0	1.14	1.25	1.36

## Safe Compressed Air Dryer Technical Data

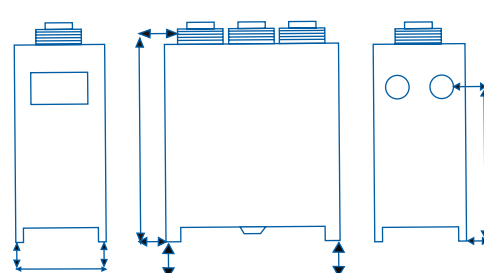
Safe Model	bar	psi	m3/mi	m3/h	Cfm	V/Ph/Hz	Connection Size	L	W	H	Z	Kg	Gas
SAFE 900	16	232	0,9	54,0	31,8	230/1/50-60	1/2"	470	345	590	545	30	R-134 a
SAFE 1200	16	232	1,2	72,0	42,4	230/1/50-60	1/2"	470	345	590	545	31	R-134 a
SAFE 1800	16	232	1,8	108,0	63,6	230/1/50-60	3/4"	470	345	665	610	32	R-134 a
SAFE 2200	16	232	2,2	132,0	77,7	230/1/50-60	3/4"	470	345	665	610	32	R-134 a
SAFE 2600	16	232	2,6	156,0	91,9	230/1/50-60	1"	580	480	790	735	44	R-134 a
SAFE 3100	16	232	3,1	186,0	109,6	230/1/50-60	1"	580	480	790	735	45	R-134 a
SAFE 3700	16	232	3,7	222,0	130,8	230/1/50-60	1"	580	480	790	735	47	R-134 a
SAFE 5500	16	232	5,5	330,0	194,4	230/1/50-60	1"	690	520	1090	1040	79	R-134 a
SAFE 6500	16	232	6,5	390,0	229,7	230/1/50-60	1-1/2"	690	520	1090	1040	83	R-134 a
SAFE 8500	16	232	8,5	510,0	300,4	400/3/50-60	2"	855	735	1195	1085	140	R-407 c
SAFE 11000	16	232	11,0	660,0	388,7	400/3/50-60	2"	855	735	1195	1085	140	R-407 c
SAFE 13000	16	232	13,0	780,0	459,4	400/3/50-60	2"	855	735	1195	1085	150	R-407 c
SAFE 17800	16	232	17,8	1.068,0	629,1	400/3/50-60	2-1/2"	1105	830	1380	1090	226	R-407 c
SAFE 20000	16	232	20,0	1.200,0	706,8	400/3/50-60	2-1/2"	1105	830	1380	1090	234	R-407 c
SAFE 25500	16	232	25,5	1.530,0	901,2	400/3/50-60	3"	1395	830	1665	1085	273	R-407 c
SAFE 30000	16	232	30,0	1.800,0	1060,2	400/3/50-60	3"	1395	830	1665	1085	330	R-407 c
SAFE 35500	16	232	35,5	2.130,0	1254,6	400/3/50-60	4"	1395	830	1665	1085	334	R-407 c
SAFE 40000	16	232	40,0	2.400,0	1413,6	400/3/50-60	4"	1395	830	1665	1085	348	R-407 c
SAFE 45000	16	232	45,0	2.700,0	1590,3	400/3/50-60	DN-100	1850	950	2300	1570	480	R-407 c
SAFE 50000	16	232	50,0	3.000,0	1767,0	400/3/50-60	DN-150	1850	950	2300	1570	552	R-407 c
SAFE 60000	16	232	60,0	3.600,0	2120,4	400/3/50-60	DN-150	1850	950	2300	1570	700	R-407 c
SAFE 71000	16	232	71,0	4.260,0	2509,1	400/3/50-60	DN-150	1850	950	2300	1570	800	R-407 c
SAFE 80000	16	232	80,0	4.800,0	2827,2	400/3/50-60	DN-200	2600	950	2300	1570	950	R-407 c
SAFE 90000	16	232	90,0	5.400,0	3180,6	400/3/50-60	DN-200	2600	950	2300	1570	1250	R-407 c
SAFE 106000	16	232	106,0	6.360,0	3746,0	400/3/50-60	DN-200	2600	950	2300	1570	1380	R-407 c
SAFE 120000	16	232	120,0	7.200,0	4240,8	400/3/50-60	DN-200	2600	950	2300	1570	1500	R-407 c



Models between Safe 900 and 8.500



Models between Safe 8.500 and 25.500



Models between Safe 25.500 and 120.000



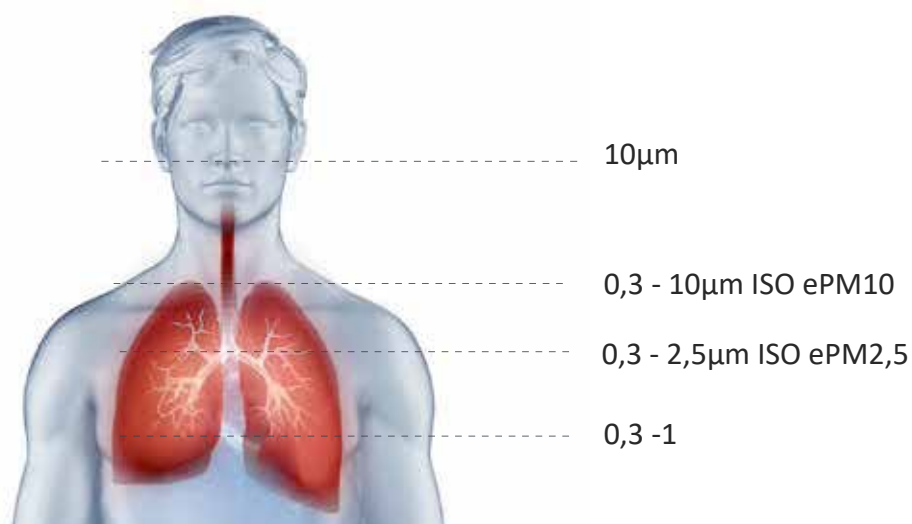


A close-up photograph of two air filters. The top filter is black with pleated folds, and the bottom filter is white with pleated folds. A dark blue semi-transparent banner is overlaid across the middle of the image, containing the text "Atmospheric Air Filtration" in white.

# Atmospheric Air Filtration



## Respirable Particle Size



### EN 779:2012 CLASSIFICATION

Group	Class	Final Pressure Drop (pa)	Average Arrestance of Synthetic Dust (%)	Average Arrestance 0,4µ Particles (%)	Minimum Efficiency of 0,4µ Particles (%)
Coarse	G1	250	$50 \leq Am \leq 65$	-	-
	G2	250	$65 \leq Am \leq 80$	-	-
	G3	250	$80 \leq Am \leq 90$	-	-
	G4	250	$90 \leq Am$	-	-
Medium	M5	450	-	$40 \leq Em \leq 60$	-
	M6	450	-	$60 \leq Em \leq 80$	-
Fine	F7	450	-	$80 \leq Em \leq 90$	35
	F8	450	-	$90 \leq Em \leq 95$	55
	F9	450	-	$95 \leq Em$	70

Group	EN 1822				Integral Value of Efficiency in the MPPS % in	Integral Value of Penetration in the MPPS % in	Local Value of Efficiency in the MPPS % in	Local Value of Penetration in the MPPS % in	Local Value of Efficiency in the MPPS % in
Suspended	E	E10	MERV 16	600	$\geq 85$	$\geq 15$	-	-	-
		E11	NA	600	$\geq 95$	$\geq 5$	-	-	-
		E12	NA	600	$\geq 99.5$	$\geq 0.5$	-	-	-
	H	H13	NA	600	$\geq 99.95$	$\geq 0.05$	$\geq 99.75$	$\geq 0.25$	$\geq 99.75$
		H14	NA	600	$\geq 99.995$	$\geq 0.005$	$\geq 99.975$	$\geq 0.025$	$\geq 99.975$
	U	U15	NA	600	$\geq 99.9995$	$\geq 0.0005$	$\geq 99.9975$	$\geq 0.0025$	$\geq 99.9975$
		U16	NA	600	$\geq 99.99995$	$\geq 0.00005$	$\geq 99.99975$	$\geq 0.00025$	$\geq 99.99975$
		U17	NA	600	$\geq 99.999995$	$\geq 0.000005$	$\geq 99.9999$	$\geq 0.0001$	$\geq 99.9999$

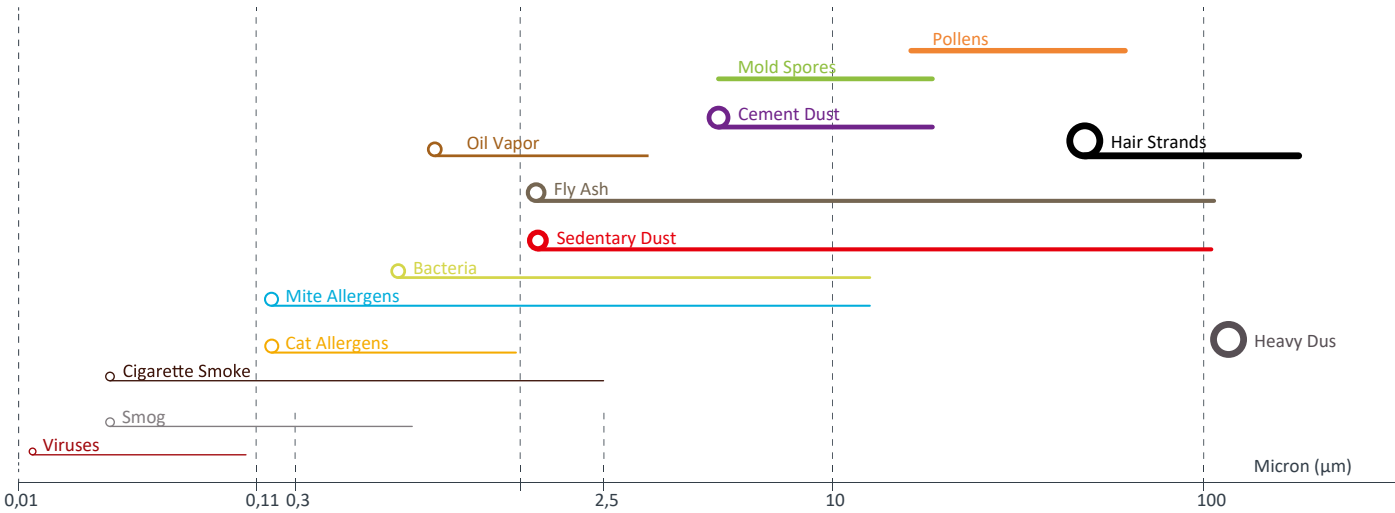
# International Classification Standards

Air filtration system has been used for a wide variety of purposes. To improve this system during the time, various standards have been defined. One of the most famous standards; EN 779 remained in effect from 2012 to mid-2018. EN 779:2012 Standard classifies air filters according to the lowest filtration efficiency. Particle size that forms a basis to the efficiency is regarded as 0,4 µm and filters are separated into three groups. These groups are; G, M and F.

For years, industry experts have denationalmanded an improved standard to replace EN 779 due to highly unrealistic test conditions and test results with limited relevance to real-world performance. EN 779 was replaced by ISO 16890 in 2018. ISO 16890 provides lab evaluation procedures which more realistically simulate actual operating conditions, replacing the old standard’s filter classes G1-F9 by a classification system based on particulate groups PM1, PM2.5 and PM10. These same particulate categories are used by the World Health Organization in evaluation of environmental air quality.

FILTER GROUPS					PARTICLE DIAMETER SIZE RANGE	
min.requirement					efficiency	size range
ISO GROUP	ePM1 min.	ePM5 min.	ePM10 min.	Class Reporting Value		
ISO Coarse	-	-	<50%	Initial gravimetric arrastance	ePM10	0,3≥x≥10
ISO ePM10	-	-	≤50%	ePM10	ePM2.5	0,3≥x≥2.5
ISO ePM2.5	-	≤50%	-	ePM2.5	ePM1	0,3≥x≥1
ISO ePM1	≤50%	-	-	ePM1		

## SIZE OF POLLUTANTS IN AIR









# Pre-filters



## Coarse Filters

The objective of coarse filtration, also known as pre-filtration, is to remove coarse suspended solids that could deposit on process equipment creating scale and corrosion sites. Filtration with coarse filters can typically range from less than 50 microns to 2000 microns. Pre-filters are meant to protect fine filters in all applications by capturing larger particles such as coarse and ePM10 both in intake air or recirculating air.



- EFFICIENCY G3-G4
- THICKNESS 30-60-100 mm
- TEMPERATURE 100°

### Glass fiber

#### Roll Filters

Glass fiber filter has the pore size of 1  $\mu\text{m}$ , it is useful for filtering highly contaminated solutions or difficult-to-filter solution. Also, glass fiber filter has extended filter life, wide range of particulate loads.

There are 7 different types of glass fiber filters and the major difference is thickness.



- EFFICIENCY G2 - G3 - G4
- THICKNESS 10-15-20-22 mm
- TEMPERATURE 80

### Synthetic

#### Roll Filters

Synthetic filtration media are used as prefilters or first level filters for air-conditioning and ventilation units. The materials are nonflammable, self-extinguishing and harmless to health.



- EFFICIENCY G2 / G3 / G4
- FRAME CARTBOARD / PLASTIC / METAL
- SYNTHETIC / POLYURETHANE / METALIC MEDIA

### PANFIL

#### Panel filters

Panel filters play an important role in extending lifetime and IAQ of air handling units in residential and commercial buildings, hospitals or even make-up units for cleanroom processes. Panel filters are usually used as pre-filters or first-stage filters. Their main role is to remove larger particles such as pollens and other coarse impurities as well as water droplets.



## PREBAG

### Pocket Filters

Pre-bag filter is designed for easy installation and replacement due to its light weight and cartridge type construction. With more extended filter media surface than general pre-filters, this filter has more dust holding capacity and long-life span.

- EFFICIENCY G3-G4
- SYNTHETIC MEDIA
- GALVANIZED AND PLASTIC FRAME



## PANFIL

### Synthetic Rigid Panel Filters

The disposable Synthetic Panel Air Filter is a medium efficiency filter suitable for ventilation and air conditioning systems in different places such as the food industry and hospitals. This Synthetic Panel Air Filter consist of a dry, graduated, high loft and fully flame-retardant synthetic fiber filter media, housed within either a standard rigid cardboard filter frame, or an Air clean Moisture Resistant (AMR) cardboard frame.

- EFFICIENCY G3-G4
- SYNTHETIC MEDIA
- GALVANIZED AND PLASTIC FRAME



## MULTIBAG

### Synthetic Rigid Pocket Filters

Bag filters, or pocket filters, are used in HVAC applications as final filters in industrial, commercial and residential applications and as prefilters in HEPA installations. They are the most common air filters in HVAC systems for industrial and commercial applications as well as for residential use to improve indoor air quality and comfort. Bag filters have a significantly higher dust holding capacity and longer lifetimes than other filters.

- EFFICIENCY m5 - M6
- SYNTHETIC MEDIA
- METAL AND PLASTIC FRAME



## Fine Filters

Used as final filters in clean environments or similar applications. The fine filtration is the filtration to be able to keep the dust "fine" with a very wide scope.



### MINIPAN

#### Mini Pleated Compact Filters

Mini Pleated Compact Filters are primarily used in turbomachinery air intake systems, ventilation and air conditioning systems, laboratories, chemical and pharmaceutical plants as well as dust removal hoods at workplaces. Their innovative mini pleated technology ensures optimum utilization of filter surface and highest physical strength.

- EFFICIENCY M6-F7-F8-F9
- MICRO GLASS FIBER MEDIA
- ALUMINUM, PLASTIC OR GALVANIZED FRAME



### MULTITUR

#### V-Type Rigid Bag Filters

The filter consists in a recyclable polystyrene frame. Used in main air conditioning pre-filtration and main filtration in plants with high flow rate, air purifications of smoke, pollens and filtration plants in gas turbines, the advantages of this type of filter are long service life, light and robust and large filter surface.

- EFFICIENCY M6-F7-F8-F9
- GLASS FIBER MEDIA
- PLASTIC OR METAL FRAME
- 80 °C OR 120 °C HT SERIES
- PROTECTION GRID AND PU GASKET



## MULTICELL

### Rigid Mini Pleat Panel Filters

Mini Pleat Panel Filters is the prefilter par excellence; no compromise on indoor air quality, energy or dust holding capacity and all these features in a light, incinerable frame. The Mini Pleat Panel Filter is the ideal solution for the first filtration stage; protection of health (improved IAQ), lower energy consumption (low pressure drop) and protection of subsequent filtration stages.

- EFFICIENCY M6-F7-F8-F9 - GLASS FIBER MEDIA
- PLASTIC FRAME 130 mm
- ALUMINUM OR GALVANIZED FRAME ANY DEPTH SIZE
- METAL FRAME 100-130-150-292 mm
- 80 °C OR 120°C HT SERIES

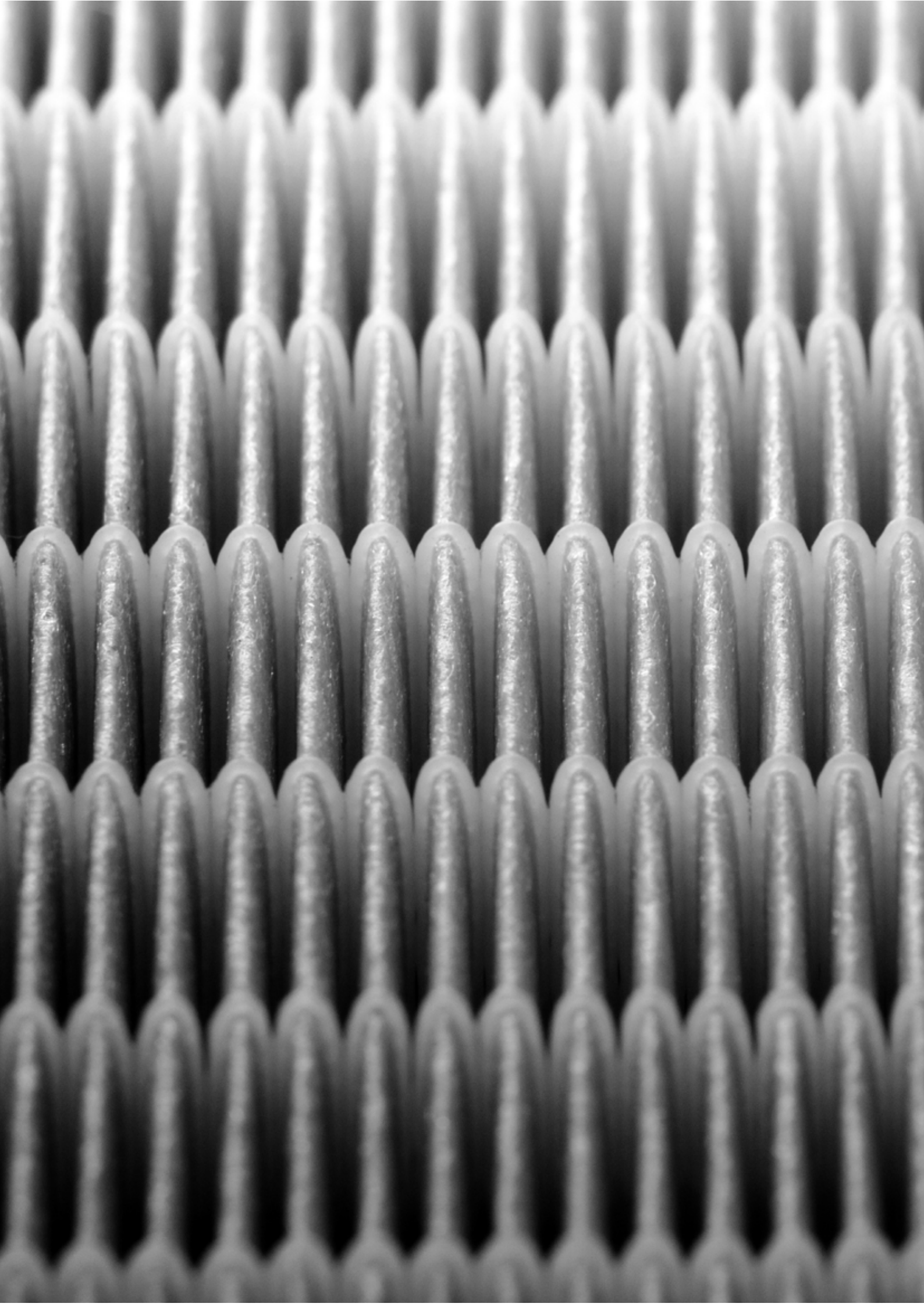


## MULTI-AS

### Aluminum Separator Filters

Filters are constructed with stainless steel, galvanized steel, aluminum, or wooden frame with aluminum foil pleated back and forth to optimize performance. These specially designed filters allow systems to control laminar air flow under high humidity.

- EFFICIENCY M6-F7-F8-F9
- GLASS FIBER MEDIA
- ALUMINUM SEPARATOR / METAL FRAME
- 250 °C HT SERIES





A close-up, black and white photograph of a filter mesh, showing a repeating pattern of vertical ridges and valleys. A solid blue horizontal band is superimposed across the center of the image.

# Absolut Filters

## HEPA-ULPA Filters

High Efficiency Particulate Air (HEPA) filters and Ultra-Low Particulate Air (ULPA) filters are air filters designed to trap a vast majority of very small particulate contaminants from an air stream. HEPA and ULPA filter panels are designed for terminal filtration in applications ranging from cleanrooms and semiconductor fabrication to the food and beverage industry and pharmaceutical manufacturers.



### HEPA-V

#### High Capacity Filters

HEPA V-shaped air filters provide extra-high efficiency final filtration in air conditioning systems, housings and diffusers for systems that require a very high airflow and low pressure drop. HEPA V filters are usually used in make-up-air or recirculation units as a final HEPA stage to protect terminal HEPA filters in cleanrooms.

- EFFICIENCY E10 E12 - H13 H14 - U15
- HIGH CAPACITY AIR FLOW
- LOW PRESSURE DROP
- LONG SERVICE LIFE
- HIGH CAPACITY DUST LOADING



### HEPALAM-HEPAFIL

#### Laminar Flow Absolute Filters

Laminar Flow Absolute Filters are the most efficient, energy-saving HEPA and ULPA filter panels especially made for turbulent and laminar airflow applications in high-tech cleanrooms, clean benches and clean air devices.

- EFFICIENCY
- E10 - E11 - E12 - H13 - H14 - U15 - U16 - U17
- - LAMINAR AIF FLOW
- PU GASKET
- OPTIONAL DOUBLE SIDE PROTECTION GRID
- ALUMINIUM AND MDF FRAM



## HEPAHOOD

### HEPA Terminal Hood Filters

HEPA Terminal Hood Filter is a compact, ready-to-install HEPA and ULPA filter diffuser used as a final filtration solution for cleanrooms. Protect personnel, equipment and process against airborne particles. Ideal in laboratories, cleanrooms, hospitals, commercial kitchens, schools or wherever there is a strictly controlled environment.

- - EFFICIENCY E11 - E12  
- H13 - H14 - U15 - U16 - U17
- ALUMINUM FRAME
- AIR OUTLET SURFACE MESH
- CONNECTED DIRECTLY TO CHANNEL
- DOUBLE PROB FOR DOP TEST AND PRESSURE DROP
- OPTIONAL AIR DAMPER



## HEPAGEL

### Gel Gasket HEPA Filters

Soft sealing material that results in filter installations that are easy to seal and require low clamping pressure compared to typical foam gasket systems. In general, gels are formed by carefully mixing measured parts of the co-polymer and adding it to the HEPA channel.

- EFFICIENCY E11 - E12  
- H13 - H14 - U15 - U16 - U17
- LAMINAR AIR FLOW
- LEAKAGE FREE WITH GEL GASKET
- DOUBLE SIDE PROTECTION GRID
- GLASS FIBER MEDIA





## HEPAFIL

### Depth Pleated HEPA Filters

Depth Pleated HEPA Filters offer HEPA-level efficiencies for final filtration in the most critical of applications, such as pharmaceutical, medical and research facilities. They work in existing systems that require high airflow and low pressure drop. Depth Pleated HEPA Filters are usually used in make-up-air or recirculation units as a final HEPA stage to protect terminal HEPA filters in cleanrooms. They can also be used in exhaust air to help remove all harmful ultra-fine particles, whether chemical, biological or radioactive.

- EFFICIENCY E11 - E12 - H13 - H14 - U15 - U16
- GLASS FIBER MEDIA
- 100 - 135 - 150 - 250 mm PLEATED DEPTH
- 80 °C OR 120°C HT SERIES
- GALVANIZED STAINLESS STEEL OR MDF FRAME

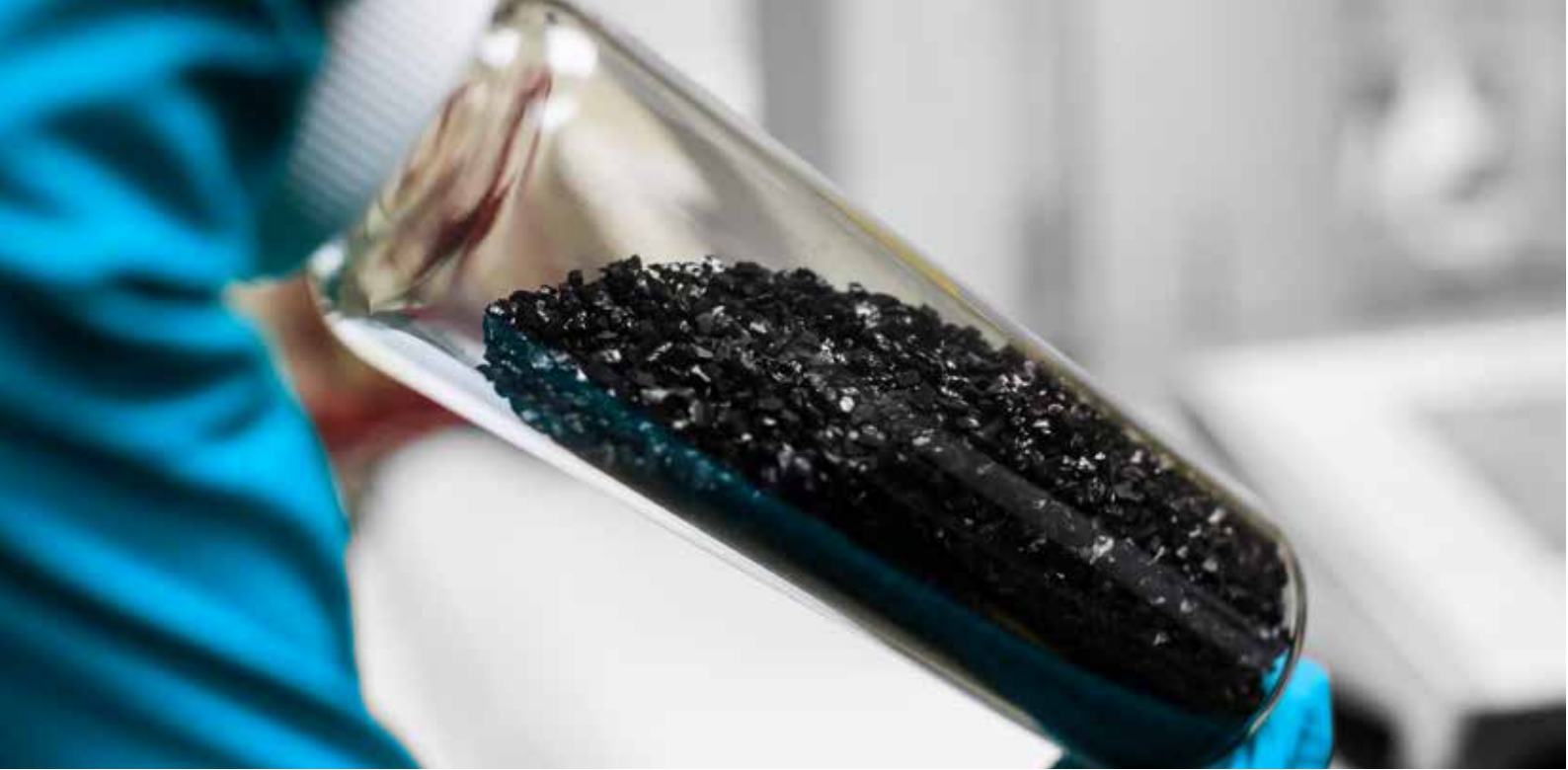


## FFU

### Fan Filter Unites

Fan filter unit is a type of motorized air filtering equipment. It is used to supply purified air to cleanrooms, laboratories, medical facilities or microenvironments by removing harmful airborne particles from recirculating air. The units are installed within the system's ceiling or floor grid. Units often contain their own pre-filter, HEPA filter and internally controllable fan air distribution

- EFFICIENCY E10 - E11 - E12 - H13 - H14 - U15 WITH PRE FILTER
- GLASS FIBER MEDIA
- METAL FRAME
- AIR VOLUME CONTROL
- OPTIONAL DPG
- COMPACT DESIGN
- PORTABLE SYSTE



## ACTIVATED CARBON FILTERS

Carbon filtering is commonly used for water purification, air filtering and industrial gas processing, for example the removal of siloxanes and hydrogen sulfide from biogas. It is also used in a number of other applications, including respirator masks, the purification of sugarcane and in the recovery of precious metals, especially gold. It is also used in cigarette filters and in the EVAP used in cars.


## CARBOFIL

Pleated Odor A.C. Filters



- RELATIVE HUMIDITY 70%
- TEMPERATURE 50°
- PLASTIC FRAME
- CARBON PLEATED HIGH SURFACE AREA
- EASY TO INSTALL



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