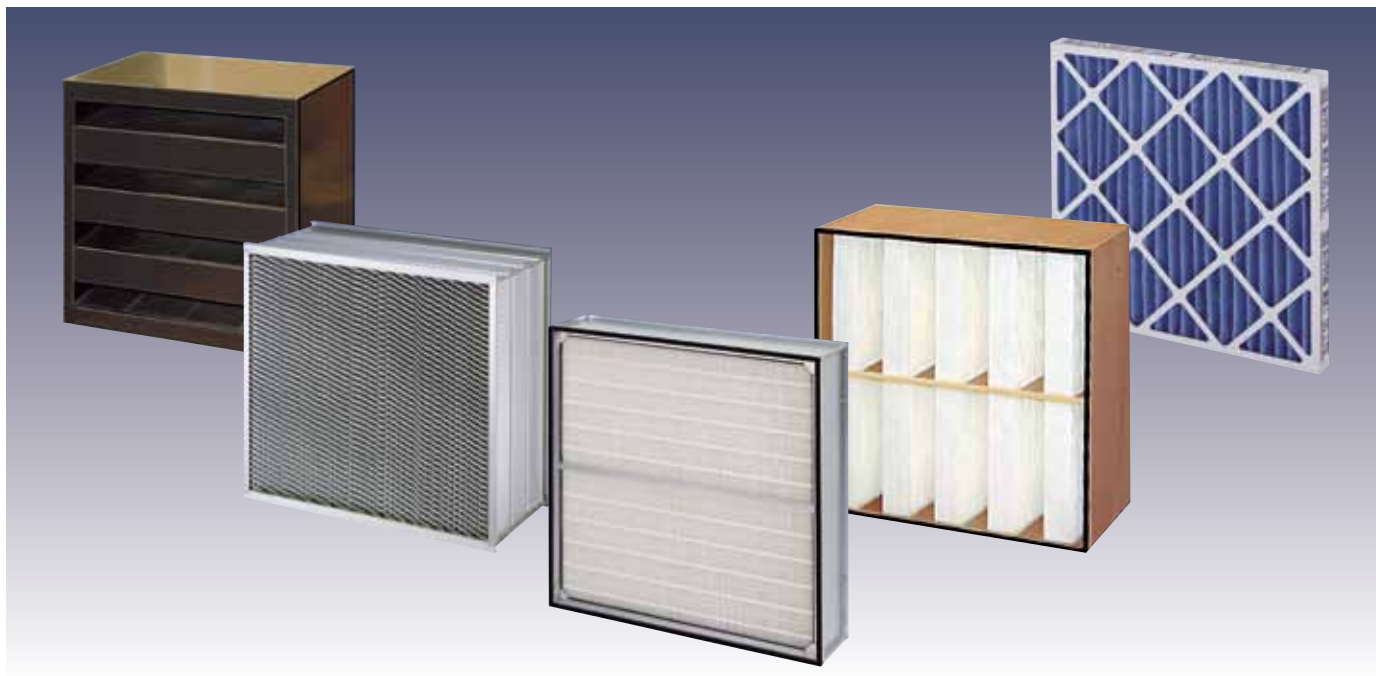


# AIR FILTER



## Features

### Various models

1. Our abundant product line-up includes pre-filters (panel, roll type, etc.), and medium (long lifetime, large air volume, anti sea salt, thin type, etc.). The most suitable filters for various applications are available.
2. Low boron filters and sterilizing enzyme filters have been added to our line-up, and our wide selection can meet your various needs. Choose from various grades of collection efficiency and pressure drop.
3. We offer various types of chemical filters for various applications, such as AHU/MAU, RA processing and EX processing, in both activated carbon (granular activated carbon) based and ion exchange resin .
4. We can design the filter with various requirements for its collection efficiency and pressure drop.

### Environmentally friendly

In consideration of protecting the global environment, we have media changeable filters which the frames can be re-used.

### A wide range of gases can be removed

Various gases which are difficult to handle in semiconductor or LCD production plants, such as acid gases (ex. NO<sub>x</sub>), alkali gases (ex. ammonia) and organic gases (ex. ester-DOP or so) can be removed.

### Various Dimensions

We can design the filter with various dimension requested.

1. Particles in Atmosphere ..... 2

2. Filter application example ..... 3

### 3. Products

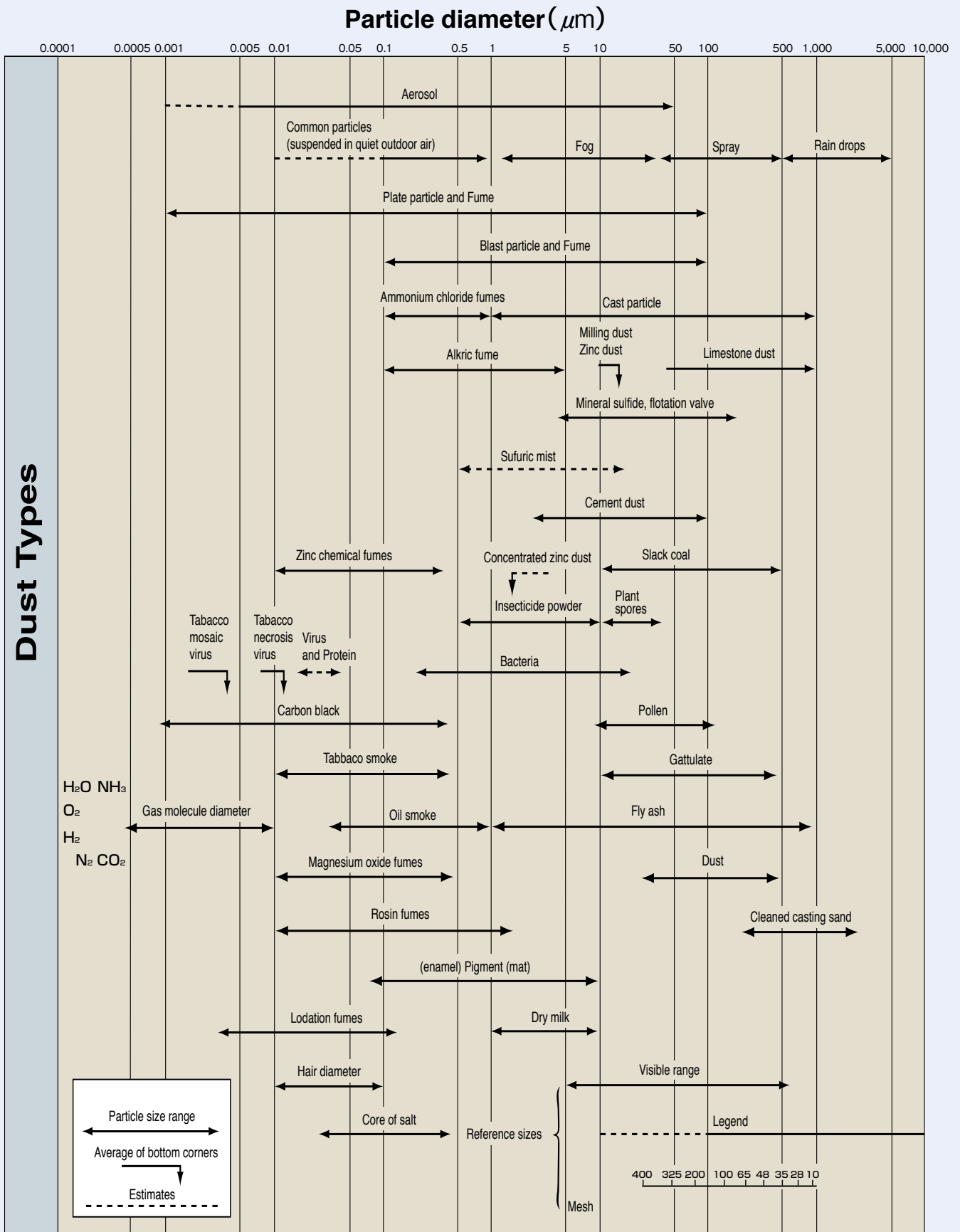
Type	Grade	Name	Type	Media	Model	Efficiency	Inspection	Target Particle (μm)	Page
Antibacterial	Pre	Antibacterial pre	Panel	Non-woven	DS-BK2	57	Mass weighing method	—	3
Antibacterial	Medium performance	Antibacterial medium performance	Separator	Glass paper	AST-BK2	65,90,95	Light dispersion addition method	—	3
Antibacterial	HEPA	Antibacterial HEPA	Separator	Glass paper	ATMC-BK2	99.97	Calculation method	0.3μm	3
General	Medium performance	Elelta	Mini pleats	Non-woven	EML EML-MF	65,90	Light dispersion addition method	—	4
Antifungal	Medium performance	Anti fungal Elelta	Mini pleats	Non-woven	EML-B	65,90	Light dispersion addition method	—	5
General	Pre	DS-S	Insertion panel	Non-woven	DS-S	90	Mass weighing method	—	6
General	Pre	Dusclean	Panel	Non-woven	DS	57~82	Mass weighing method	—	7
General	Medium performance	Lelphi	Embossed	Glass paper	LMXL LMEL	65,90,95	Light dispersion addition method	—	8
<small>Salt corrosion countermeasure</small>	Medium performance	Builtron	Double pleats	Non-woven	BLT-S	90	Light dispersion addition method	—	9
General	HEPA	Atomos	Separator	Glass paper	ATM	99.97 0.3μm	Calculation method	0.3μm	10
General	HEPA	Atomos	Separator	Glass paper	ATMC	99.97 0.3μm	Calculation method	0.3μm	11
General	HEPA	ATMLK	Mini pleats	Glass paper	ATMLK	99.99 0.3μm	Calculation method	0.3μm	12
General	HEPA	ATML	Mini pleats	Glass paper	ATML	99.99 0.3μm	Calculation method	0.3μm	13
General	ULPA	ATMML	Mini pleats	Glass paper	ATMML	99.999 0.1μm	Calculation method	0.1μm	14
General	CHEMICAL	Puresmell	Tray	Activated charcoal	PUR	About 90	—	—	15~16
General	CHEMICAL	ECSL	Mini pleats	Ion exchange resin	ECSL	About 90	—	—	17~18
General	CHEMICAL	ACGL ACGM	Mini pleats Separator	Granular activated charcoal	ACGL ACGM	About 90	—	—	19~20
General	CHEMICAL	NECS NACG	Mini pleats	Ion exchange resin Granular activated charcoal	NECS NACG	About 90	—	—	21~22

4. Technical term explanation ..... 23

5. Target gas and features ..... 24

6. Handling Manual ..... 25

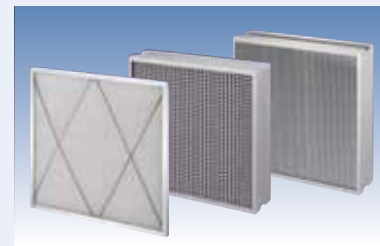
## 1. Particles in Atmosphere



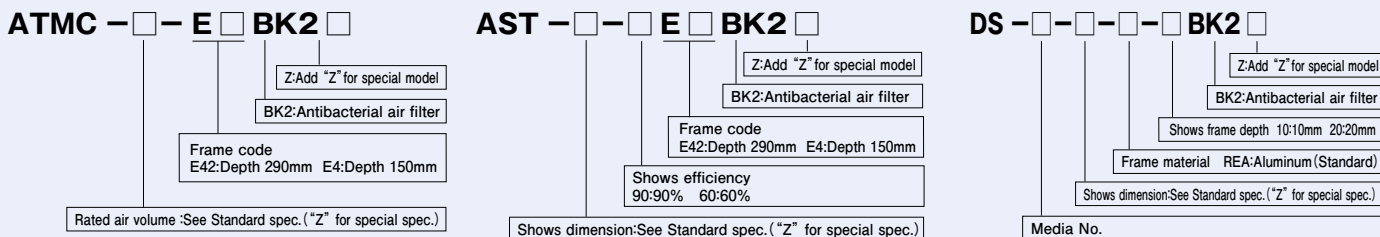
## Antibacterial air filter

### HEPA, Medium, Pre filter

Impregnated inorganic antibacterial agent with sterilization performance, safety, stability, etc. The catalytic action of the antibacterial agent suppress growth of the collected bacteria. Furthermore, the HEPA filter is confirmed to have inactivating activity not only for bacteria but also influenza viruses.



#### Model number



#### Standard specification

Grade	Model	Dimensions (mm) ※1 H×W×D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)
				Initial	Final	
HEPA	ATMC-28-E4BK2	610×610×150	28	249	498	99.97 at 0.3 μm
	ATMC-34-E4BK2	610×760×150	34			
	ATMC-42-E4BK2	610×915×150	42			
Medium	AST-28-90E4BK2	610×610×150	28	78	196	90~95 Colorimetric concentration method
	ASTC-28-95E4BK2	610×610×150	28	118	196	
Roughing	DS-150-31-REA-10BK2	610×610×10	56	29	147	57 Mass concentration method

※1 Please contact us regarding available sizes.

#### Materials and use environment

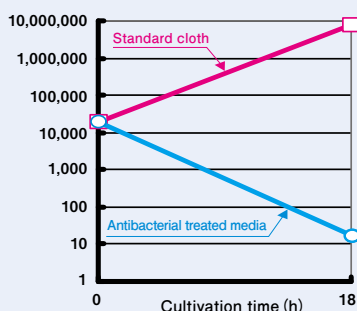
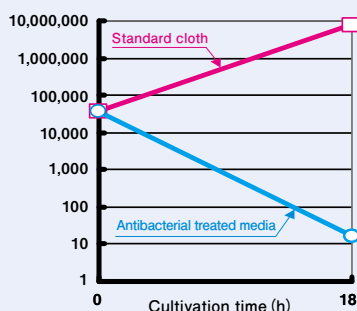
Items	Material		
	HEPA	Medium	Pre
Media	Glass fiber (antibacterial agent impregnated)	Glass fiber (antibacterial agent impregnated)	Non-woven fabric (antibacterial agent impregnated)
Frame	Aluminum	Aluminum	Aluminum, galvanized iron wire
Sealant	Special adhesive	Special adhesive	—
Separator	Aluminum	Aluminum	—
Gasket	EPDM	EPDM	—
Constant use temperature	<60°C		
Constant use humidity	<95%RH		

### ~HEPA filter antibacterial ability, virus inactivation ability~

#### Antibacterial test results

In an antibacterial test, viable bacteria was attached to the media and cultivated for 18 hours. Suppression (large reduction) of bacterial growth was confirmed, as shown in the charts below.

- (1) *Staphylococcus aureus* (G+) Diameter 0.5 ~ 1.5 μm  
 (2) *Klebsiella pneumoniae* (G-) Diameter 0.3 ~ 1.0, length 0.6 ~ 6.0 μm

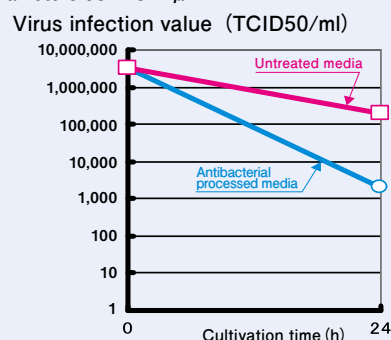


Antibacterial test JIS L1902 (2008 bacteria liquid absorption method) was performed

#### Virus Inactivation test results

Virus infection value was measured after a liquid virus was dropped on the media and maintained for 24 hours. As shown in the chart below, reduction results were achieved.

- (3) Influenza virus Type A (H1N1)  
 Diameter 0.08 ~ 0.12 μm

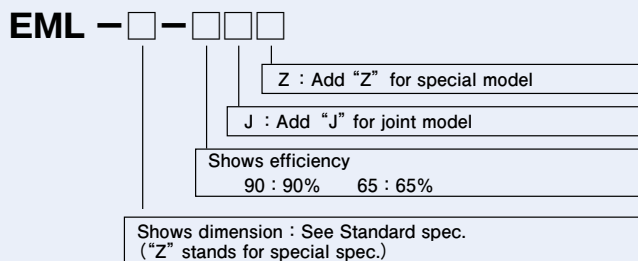


※Virus inactivation test was performed at Japan Food Research Laboratories.

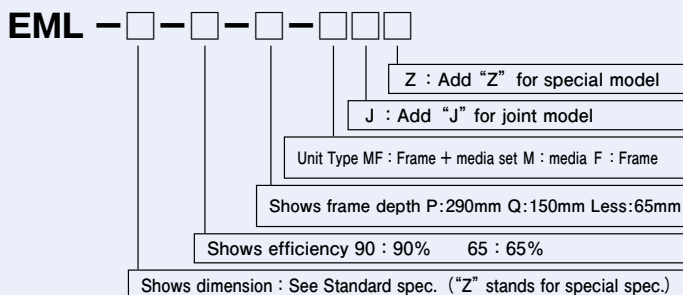
## Elelta filter (Low pressure drop medium filter)



### Model number



## Elelta filter Media Changeable (Media changeable type)



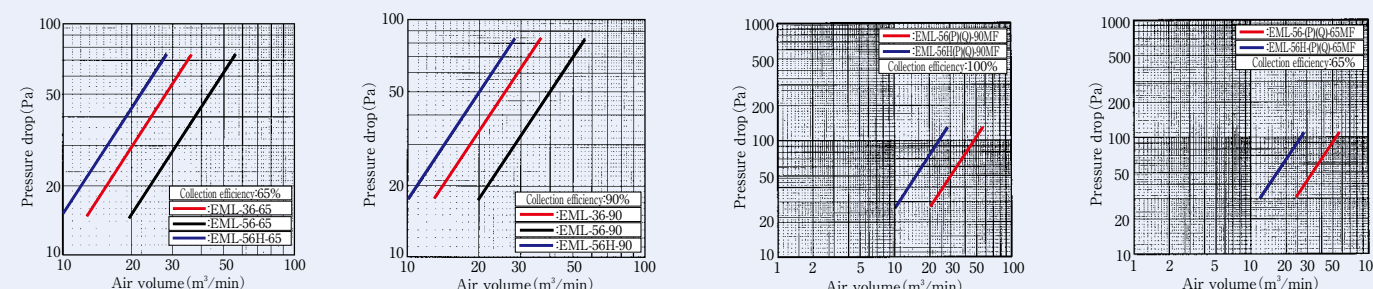
### Standard specification (sample)

Model	Dimension H × W × D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)
			Initial	Final		
EML - 36 - 90	500 × 500 × 65	36	83	294	90	2.5
EML - 56 - 90	610 × 610 × 65	56	83	294	90	3.0
EML - 56H - 90	610 × 305 × 65	28	83	294	90	2.0
EML - 36 - 65	500 × 500 × 65	36	74	294	65	2.5
EML - 56 - 65	610 × 610 × 65	56	74	294	65	3.0
EML - 56H - 65	610 × 305 × 65	28	74	294	65	2.0
EML - 56 - 90 - P - MF	610 × 610 × 290	56	127	294	90	7.0
EML - 56H - 90 - P - MF	610 × 305 × 290	28	127	294	90	3.5
EML - 56 - 90 - Q - MF	610 × 610 × 150	56	127	294	90	4.0
EML - 56H - 90 - Q - MF	610 × 305 × 150	28	127	294	90	2.0
EML - 56 - 90 - MF	610 × 610 × 65	56	83	294	90	3.0
EML - 56H - 90 - MF	610 × 305 × 65	28	83	294	90	2.0
EML - 56 - 65 - P - MF	610 × 610 × 290	56	108	294	65	7.0
EML - 56H - 65 - P - MF	610 × 305 × 290	28	108	294	65	3.5
EML - 56 - 65 - Q - MF	610 × 610 × 150	56	108	294	65	4.0
EML - 56H - 65 - Q - MF	610 × 305 × 150	28	108	294	65	2.0
EML - 56 - 65 - MF	610 × 610 × 65	56	74	294	65	3.0
EML - 56H - 65 - MF	610 × 305 × 65	28	74	294	65	2.0

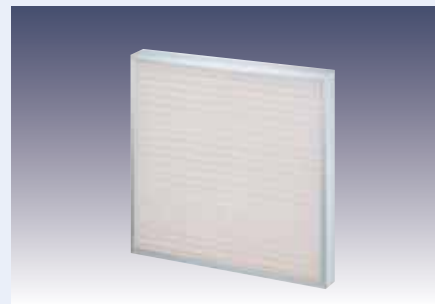
### Materials and Temperature / Humidity

Model	Materials						Temperature / Humidity	
	Frame	Media	Separator	Sealant	Floor material	Gasket	Normal temperature	Normal humidity
Elelta	Aluminum	Non-woven fabric	Hot melt	Polyurethane	—	Chloroprene	< 60°C	< 95% RH
Elelta filter Media Changeable	Steel plate			—	urethane foam			

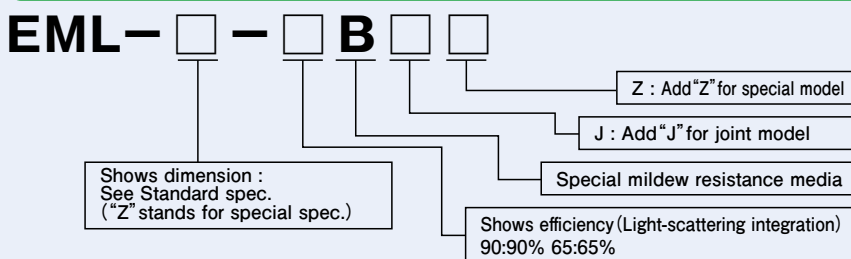
### Specification Air Volume vs. Pressure Drop



## Mildew resistance low pressure drop medium filter (Mildew resistance ELELTA)



### Models



### Features

Mildewcide was added on the media  
Low pressure drop Electret media is used

### Standard specification (sample)

Model	Dimension H×W×D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%) (Colorimetric concentration method)	Weight (kg)
			Initial	Final		
EML-36-90B	500×500×65	36	94	294	90	2.5
EML-56-90B	610×610×65	56				3.0
EML-56H-90B	610×305×65	28				2.0
EML-36-65B	500×500×65	36	84	294	65	2.5
EML-56-65B	610×610×65	56				3.0
EML-56H-65B	610×305×65	28				2.0

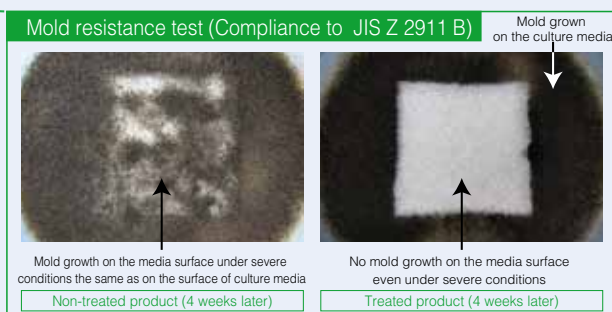
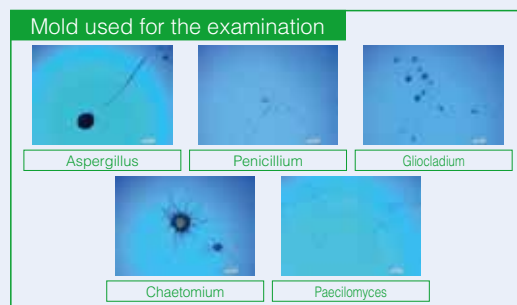
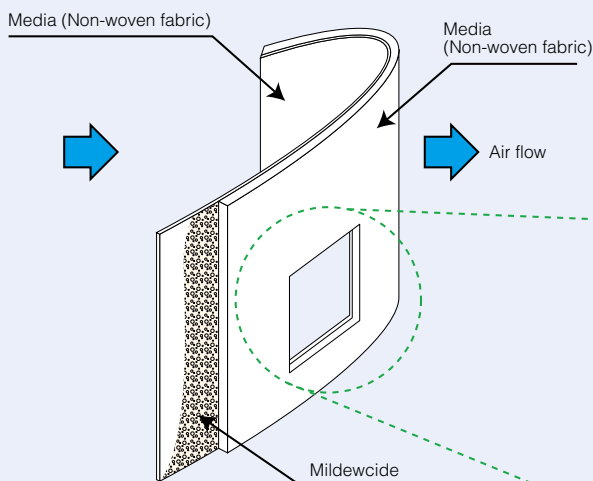
### Components and use environment

Items		Description
Materials	Frame	Aluminum
	Media	Electret Non-woven fabric (mildew resistance)
	Ribbon	synthetic resin
	Sealant	polyurethane
	Gasket	chloroprene
Temp. & Hum	Use temperature (constant)	<60°C
	Use humidity	<95%RH

### Mildew resistance agent

Effective ingredient	2-(4-Thiazolyl)benzimidazole
Structural formula	
Stability	Extremely chemically stable chemical compound, difficult to react with other materials, does not dissolve in water, solubility of an organic solvent.
Safety	Certified as a food additive in 1978

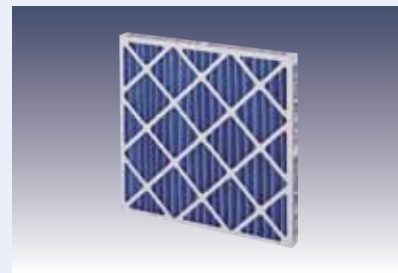
Mildewcide is sandwiched between two sheets of Non-woven fabric, growth of collected mold on the media can be suppressed for long hours. However, there is no agent which can suppress all types of mold growth.



Descriptions in this catalog are subject to change without prior notice.

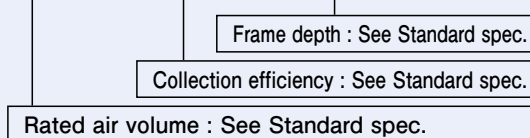
## DS-S Filter

(High efficiency, long lifetime roughing filter)



### Model

**DS - S - 56 - 90 - 46**



### Features

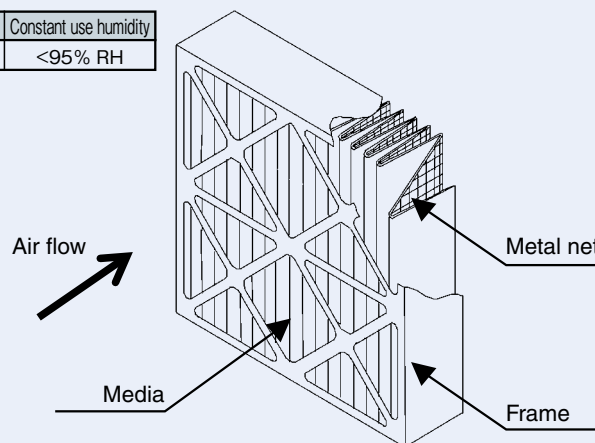
- High collection efficiency,
- Large dust volume capacity,
- Light and excellent handling capacity

### Standard Specifications

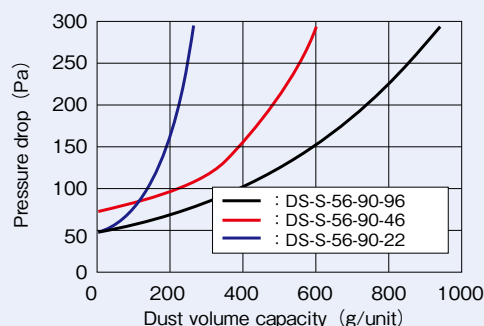
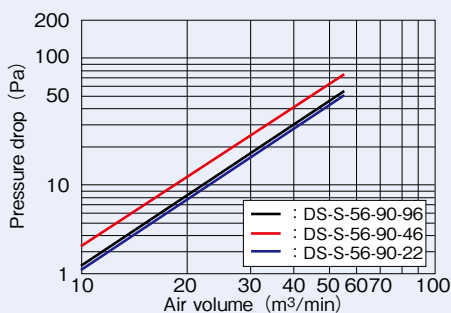
No.	Model	Dimensions (mm) H × W × D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%) Mass concentration method
				Initial	Final	
1	DS-S-56-90-96	594 × 594 × 96	56	52	294	90
2	DS-S-56-90-46	594 × 594 × 46	56	75	294	90
3	DS-S-56-90-22	594 × 594 × 22	56	50	294	90

### Components and use environment

Item	Media	Metal net	Frame	Sealant	Constant use temperature	Constant use humidity
Materials	Non-woven fabric	Galvanized iron wire	Waterproof paper	Special adhesive	<60° C	<95% RH

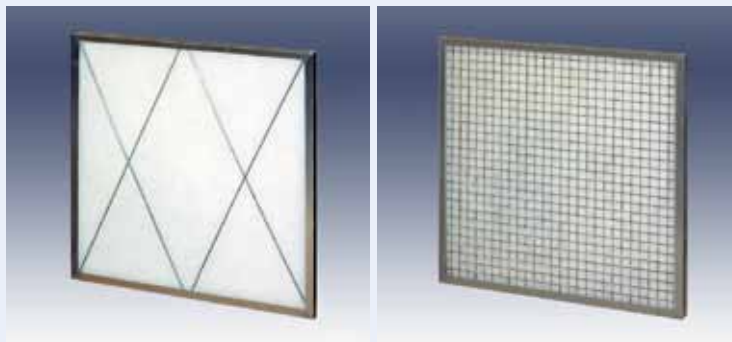


### Specification Pressure drop vs. Dust volume capacity



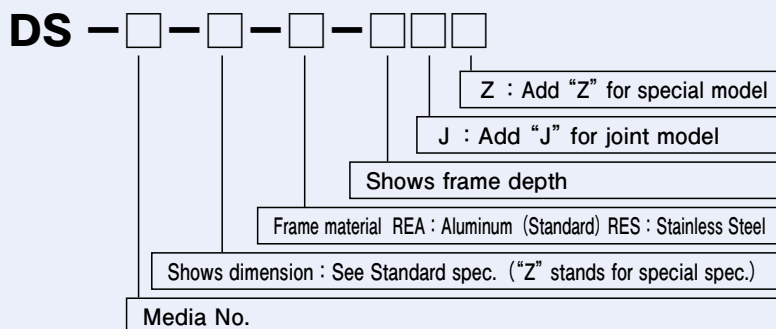
# Dusclean Filter

(Non woven fabric prefilter)

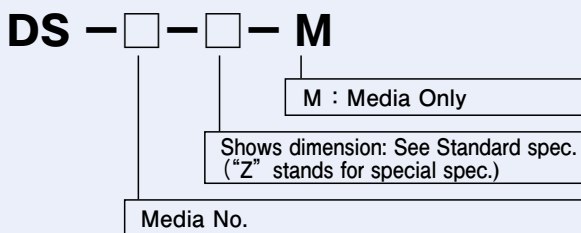


## Model number

(Frame+Media)



(Media Only)



## Media

Model	Material	Dimension (m) W×L	Thickness (mm)	Air velocity (m/sec)	Pressure drop (Pa)		Collection efficiency ※1 (%)	Re-condition	Noncombustibility
					Initial	Final			
DS - 140	Polyester	1.6 × 30	7	2.0	20	49	45	○	○
DS - 150	Polyester	1.6 × 30	7	2.5	29	147	57	○	○
DS - 300	Polyester	1.6 × 30	10	2.5	49	196	72	○	○
DS - 400	Polyester Modacrylic fiber	1.6 × 20	13	2.5	59	196	76	○	○
DS - 600	Polyester Modacrylic fiber	1.6 × 20	18	2.5	88	196	82	○	○
DS - 340	Polyester	1.6 × 20	20	2.5	49	196	75	×	○
DS - 340R	Polyester	1.6 × 20	20	2.5	59	196	85	×	○
DS - 465	Polyester Modacrylic fiber	1.6 × 20	15	1.5	74	196	80	○	○
DS - 315TS	Polyester	1.6 × 20	19	0.5/0.7	45/63	392	98	×	○

※1 ASRAE powder was used for test powder

## Standard specification (sample)

Model	Dimension (mm) ※1 H×W×D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency ※2 (%)	Weight (kg)
			Initial	Final		
DS-150-22-REA -10	500 × 500 × 10	37	29	147	57	0.9
DS-150-31-REA -10	610 × 610 × 10	56				1.1
DS-150-31H-REA-10	610 × 305 × 10	28				0.7
DS-300-22-REA -12	500 × 500 × 12	37	49	196	72	0.9
DS-300-31-REA -12	610 × 610 × 12	56				1.2
DS-300-31H-REA-12	610 × 305 × 12	28				1.0
DS-400-22-REA -15	500 × 500 × 15	37	59	196	76	0.9
DS-400-31-REA -15	610 × 610 × 15	56				1.3
DS-400-31H-REA-15	610 × 305 × 15	28				0.8
DS-600-22-REA -20	500 × 500 × 20	37	88	196	82	1.0
DS-600-31-REA -20	610 × 610 × 20	56				1.4
DS-600-31H-REA-20	610 × 305 × 20	28				0.8
DS-600-22-REA -25	500 × 500 × 25	37	88	196	82	1.0
DS-600-31-REA -25	610 × 610 × 25	56				1.4
DS-600-31H-REA-25	610 × 305 × 25	28				0.8

※1 For 10mm thickness products both sides will have face guards.

※2 ASRAE powder was used for test powder

## Materials and Temperature / Humidity

Materials		Temperature / Humidity	
Frame	Media	Normal temperature	Normal humidity
Aluminum	Polyester	< 60°C	< 95% RH



## LELFI

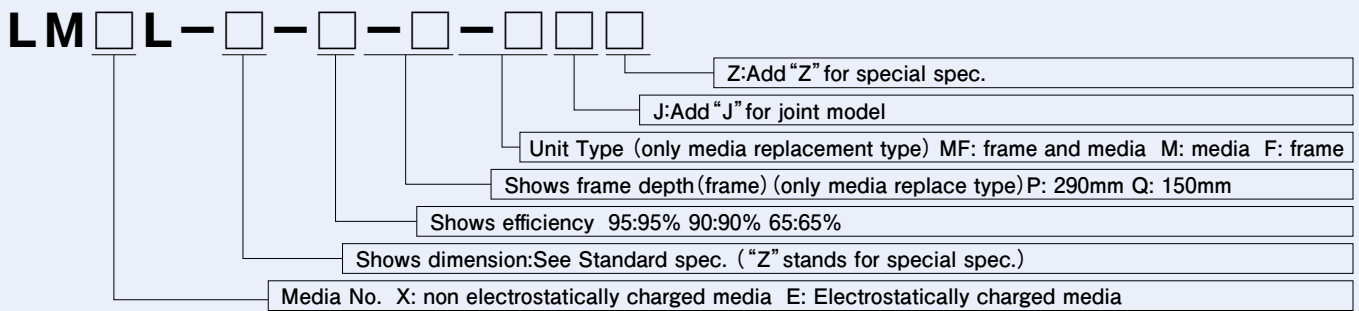
### (Super low pressure drop medium filter)



#### Features

- Low pressure drop:
- High air volume:
- Long service life:
- Thin design:

#### Model



#### Standard specification (sample)

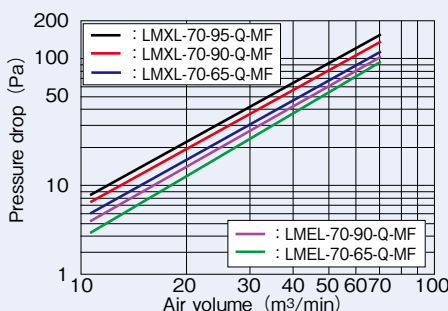
Main applications	Model ( ) are media replace type	Dimensions (mm) H×W×D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)	
				Initial※	Final		Media changeable type	Seal type
Air conditioning for clean rooms (Non electrostatically charged)	LMXL-70-95(-Q-MF)	610×610×150	70(56)	150(110)	294	95	5.0	4.5
	LMXL-70H-95(-Q-MF)	610×305×150	35(28)				3.0	2.5
	LMXL-70-90(-Q-MF)	610×610×150	70(56)	135(100)		90	5.0	4.5
	LMXL-70H-90(-Q-MF)	610×305×150	35(28)				3.0	2.5
	LMXL-70-65(-Q-MF)	610×610×150	70(56)	110(75)		65	5.0	4.5
	LMXL-70H-65(-Q-MF)	610×305×150	35(28)				3.0	2.5
Air conditioning for buildings (Electrostatically charged)	LMEL-70-90(-Q-MF)	610×610×150	70(56)	105(73)	65	90	5.0	4.5
	LMEL-70H-90(-Q-MF)	610×305×150	35(28)				3.0	2.5
	LMEL-70-65(-Q-MF)	610×610×150	70(56)	95(60)		65	5.0	4.5
	LMEL-70H-65(-Q-MF)	610×305×150	35(28)				3.0	2.5

※( ) is pressure drop responded for the rated air volume described in ( ).

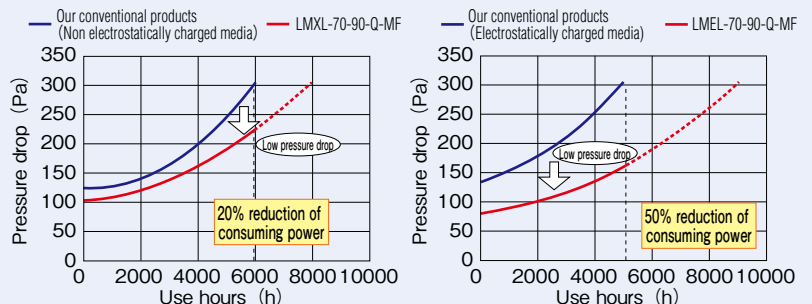
#### Materials and Temperature / Humidity

Materials						Temperature / Humidity		
Frame		Media	Reinforcement material	Floor material	Sealant	Gasket	Normal temperature	Normal humidity
Media changeable type	Seal type							
Galvanized sheet iron	Aluminum	Non-woven fabric	Synthetic resin	Urethane foam	Polyurethane	EPDM	<60°C	<95%RH

#### Air Volume vs. Pressure drop (representative value)



#### Comparison with the conventional product (an example of pressure drop transit)

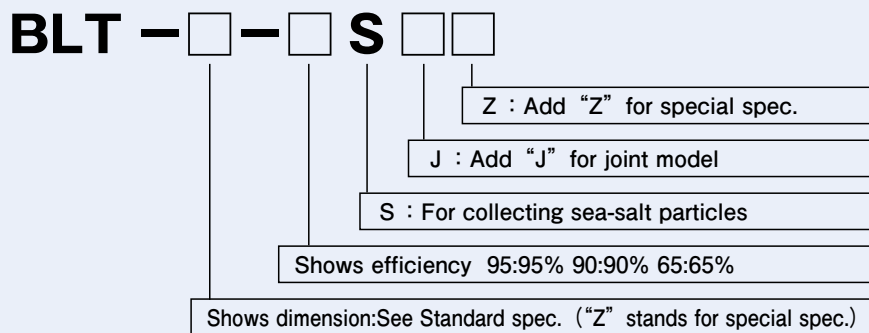


The reference value converted based on the accelerated test. (at airflow 56m<sup>3</sup>/min)

## Sea air processing Bultron (Sea air processing type medium filter)



### Model



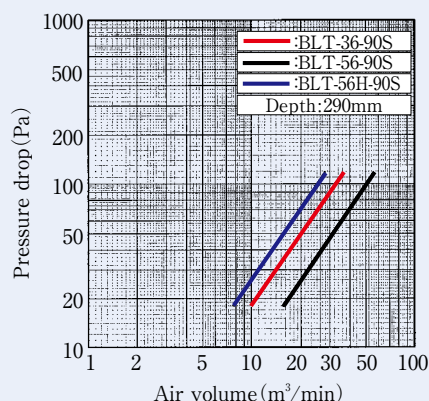
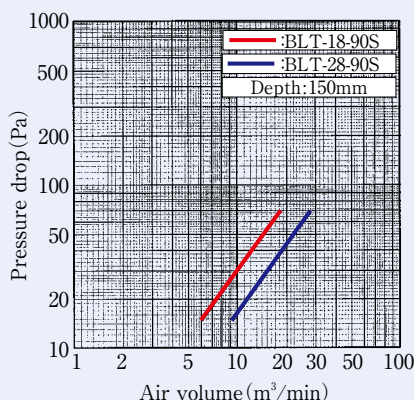
### Standard specification (sample)

Model	Dimension (mm) H×W×D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)
			Initial	Final		
BLT - 36 - 90S	500 × 500 × 290	36	118	294	90	5.0
BLT - 56 - 90S	610 × 610 × 290	56	118	294	90	7.0
BLT - 56H - 90S	610 × 305 × 290	28	118	294	90	4.0
BLT - 18 - 90S	500 × 500 × 150	18	69	294	90	2.5
BLT - 28 - 90S	610 × 610 × 150	28	69	294	90	3.5

### Materials and Temperature / Humidity

Materials				Temperature / Humidity	
Frame	Media	Sealant	Gasket	Normal temperature	Normal humidity
Plywood	Non-woven fabric	Polyurethane	Chloroprene	<60°C	< 95%RH

### Specification Air volume vs. Pressure drop (representative value)



# Atomos Perfect Filter

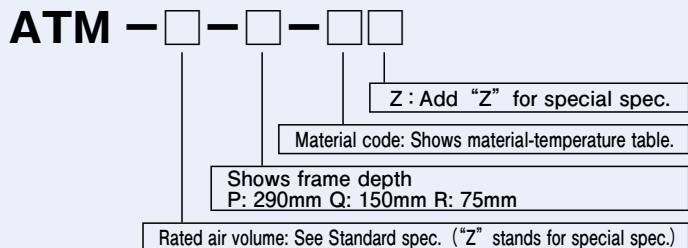
## (Standard type HEPA filter)

※ Low gas emission type are also available.

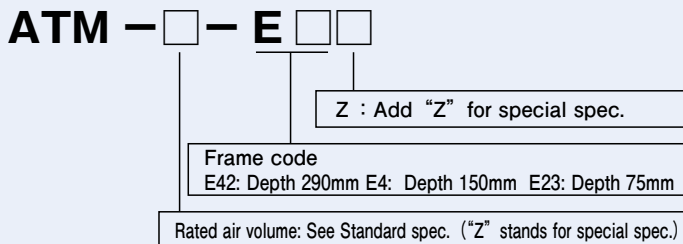


### Model

(1) Plywood frame



(2) Extruded aluminum frame



### Standard specification (sample)

Model	Dimension (mm) H×W×D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)
			Initial	Final		
ATM - 3 - P -	200 × 200 × 290	3	245	490	99.97 at 0.3 μm	3.5
ATM - 8 - P -	305 × 305 × 290	8				5.5
ATM - 22 - P -	500 × 500 × 290	22				10.5
ATM - 31 - P -	610 × 610 × 290	31				14.0
ATM - 39 - P -	610 × 760 × 290	39				16.5
ATM - 48 - P -	610 × 915 × 290	48				19.0
ATM - 1.5 - Q -	200 × 200 × 150	1.5				2.0
ATM - 4 - Q -	305 × 305 × 150	4				3.0
ATM - 17 - Q -	610 × 610 × 150	17				7.0
ATM - 21 - Q -	610 × 760 × 150	21				8.5
ATM - 26 - Q -	610 × 915 × 150	26	10.0			
ATM - 34 - Q -	610 × 1220 × 150	34	12.5			

### Materials and Temperature / Humidity

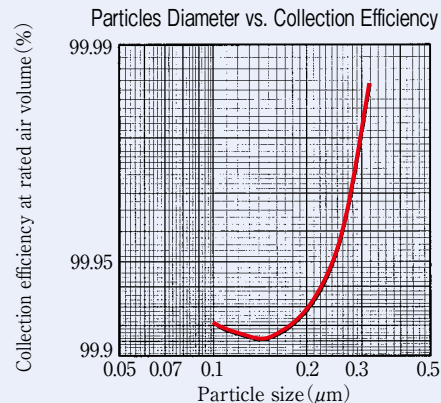
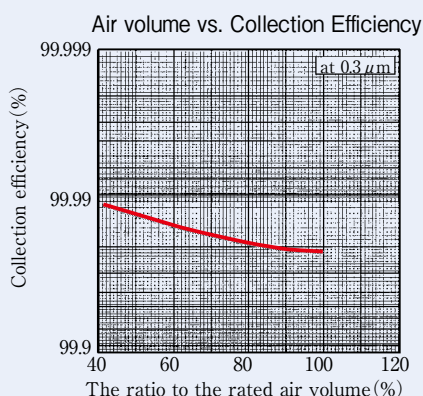
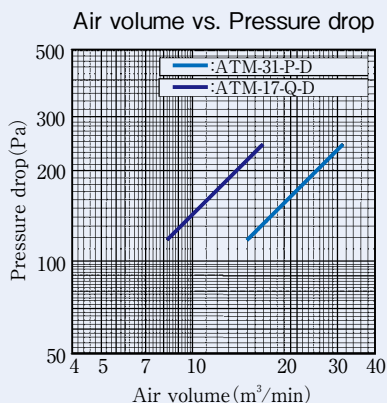
Materials or frame code	Materials					Temperature / Humidity	
	Frame	Media	Separator	Sealant	Gasket	Normal temperature	Normal humidity
A	Plywood	Glass Paper	Special processed paper	Polyurethane	Chloroprene	< 60°C	< 85%RH
D	Plywood	Glass Paper	Aluminum	Polyurethane	Chloroprene		< 95%RH
※	Extruded aluminum	Glass Paper	Aluminum	Polyurethane	Chloroprene		

※ E42: 290mm E4: 150mm

### Dimension Available

Depth (mm)	Height (mm)	Width (mm)
290, 150, 75	150 ~ 760	150 ~ 1500

### Performance



# Atomos Compact filter

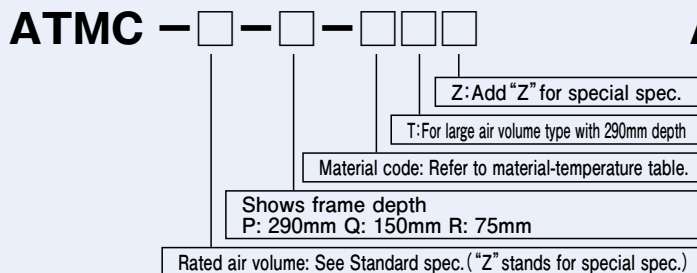
## (Large air volume type HEPA filter)

※ Low gas emission type are also available.

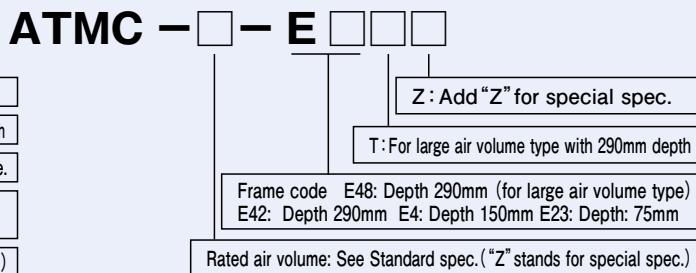


### Model

(1) Plywood frame



(2) Extruded aluminum frame



### Standard Specification (sample)

Class	Model	Dimension (mm) H × W × D	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)
				Initial	Final		
Standard	ATMC - 41 - P -	610 × 610 × 290	41	249	498	99.97 at 0.3 μm	16.0
	ATMC - 51 - P -	610 × 760 × 290	51				19.0
	ATMC - 28 - Q -	610 × 610 × 150	28				8.5
	ATMC - 34 - Q -	610 × 760 × 150	34				10.0
	ATMC - 17 - R -	610 × 610 × 75	17				4.5
	ATMC - 21 - R -	610 × 760 × 75	21				5.0
Large air volume (special separator)	ATMC - 50 - P - □ T	610 × 610 × 290	50	249 ± 20	498	99.97 at 0.3 μm	16.0
	ATMC - 62 - P - □ T	610 × 760 × 290	62				19.0
Large air volume ※	ATMC - 56 - E48T	610 × 610 × 290	56				16.0

※ For large air volume type, plywood frame is not available.

### Materials and Temperature / Humidity

Materials or frame code	Materials					Temperature / Humidity	
	Frame	Media	Separator	Sealant	Gasket	Normal temperature	Normal humidity
A	Plywood	Glass Paper	Special processed paper	Polyurethane	Chloroprene	< 60°C	< 85%RH
D	Plywood	Glass Paper	Aluminum	Polyurethane	Chloroprene		< 95%RH
※	Extruded aluminum	Glass Paper	Aluminum	Polyurethane	Chloroprene		

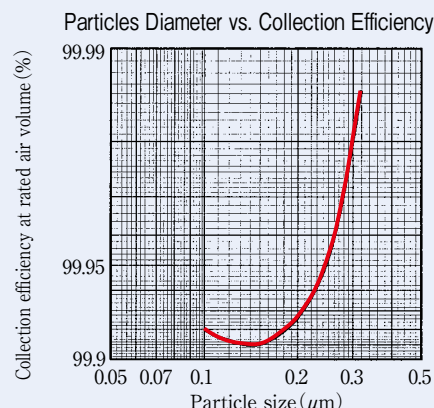
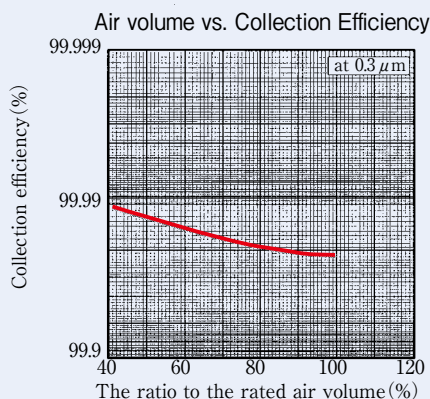
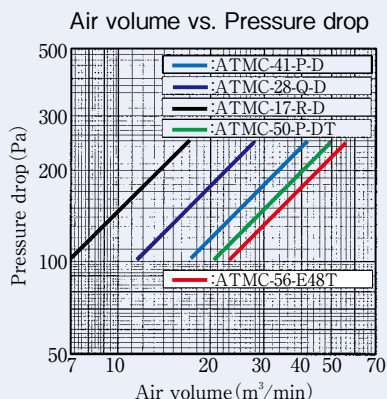
※ E42: Depth 290mm E4: Depth 150mm E23: Depth 75mm E48: Depth 290mm (for large air volume)

### Dimension Available

Depth (mm)	Height (mm)	Width (mm)
290, 150, 75	150 ~ 760	150 ~ 1500

※ AT: Height dimension 150-610 (mm) , Large volume type: Height dimension 150-740 (mm) , Width dimension 150-1000 (mm)

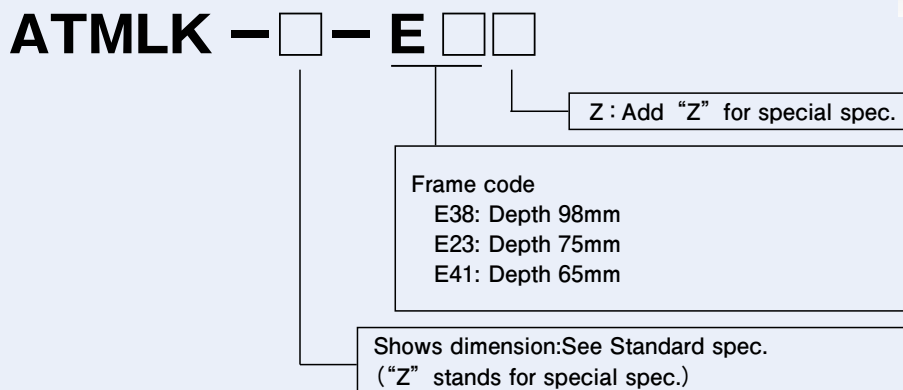
### Performance



## Large air volume minipleats ATMLK filter (Large air volume minipleats HEPA filter)



### Model



### Features

Approximately three times the air volume when compared with ATML at the same size. Collection efficiency is 99.99%. The lath mesh is included, standard.

### Standard specification (sample)

Model	Dimension (mm) H×W×D	Rated air speed (m/s)	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%) at 0.3 μm	Weight (kg)
				Initial	Final		
ATMLK – 32 – E38	610 × 610 × 98	1.61	32.0	245	498	99.99	5.0
ATMLK – 28 – E23	610 × 610 × 75	1.43	28.0				4.0
ATMLK – 25 – E41	610 × 610 × 65	1.28	25.0				3.5

※ Available for lathe mesh on the downstream side only.

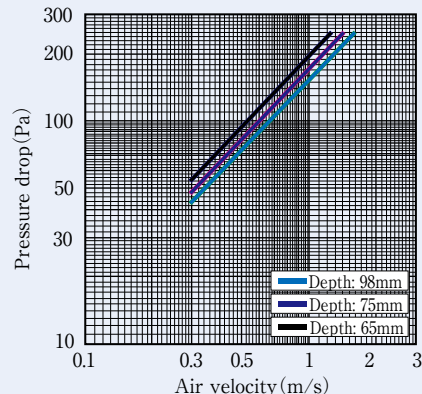
### Dimension Available

Height (mm)	Width (mm)
150 ~ 610	150 ~ 1220

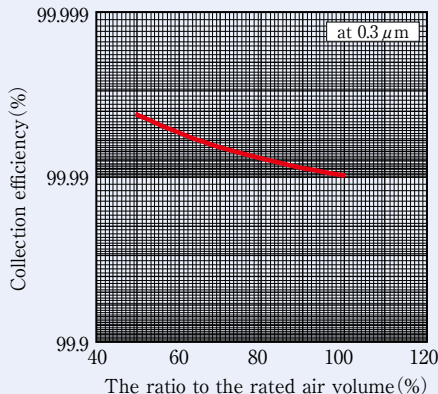
※ Please ask for other sizes.

### Performance

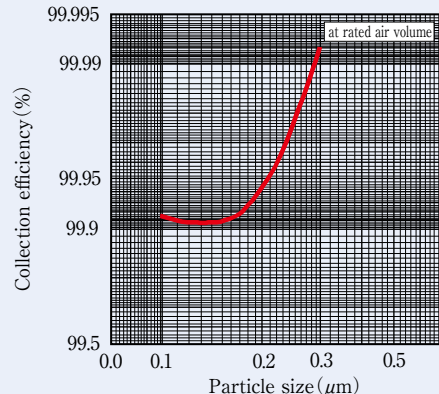
Air velocity-Pressure drop characteristics



Collection efficiency by air volume



Collection efficiency by particle size



## Atomos ATML filter (HEPA filter)

※ Low gas emission type are also available.

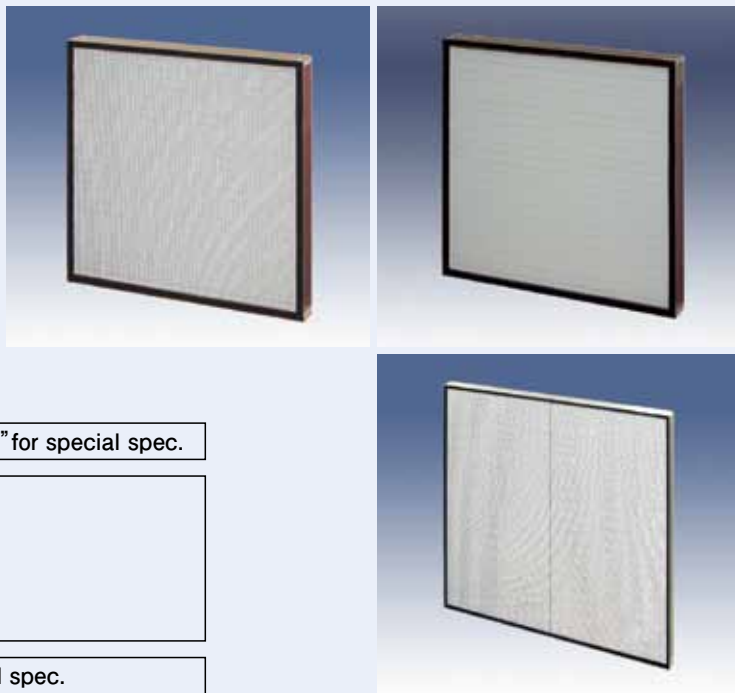
### Model

ATML -  - E

Z : Add "Z" for special spec.

Frame code  
 E38: Depth 98mm  
 E23: Depth 75mm  
 E41: Depth 65mm  
 E25: Depth 50mm

Shows dimension: See Standard spec.  
 ("Z" stands for special spec.)



### Standard specification (sample)

Model	Dimension (mm) H × W × D	Air velocity (m/s)	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)
				Initial	Final		
ATML - 10 - E38	610 × 610 × 98	0.5	10.0	84	294	99.99 at 0.3 μm	4.5
ATML - 20 - E38	610 × 1220 × 98		20.5				8.0
ATML - 10 - E23	610 × 610 × 75		10.0	88			4.0
ATML - 20 - E23	610 × 1220 × 75		20.5				7.0
ATML - 10 - E41	610 × 610 × 65		10.0	98			3.5
ATML - 20 - E41	610 × 1220 × 65		20.5				6.0
ATML - 10 - E25	610 × 610 × 50		10.0	127			3.0
ATML - 20 - E25	610 × 1220 × 50		20.5				5.0

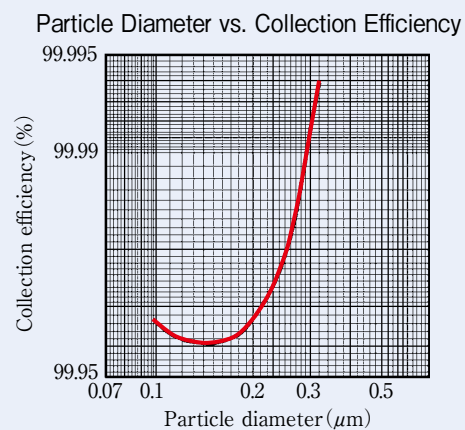
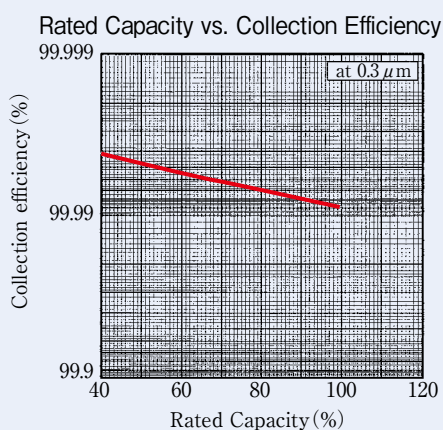
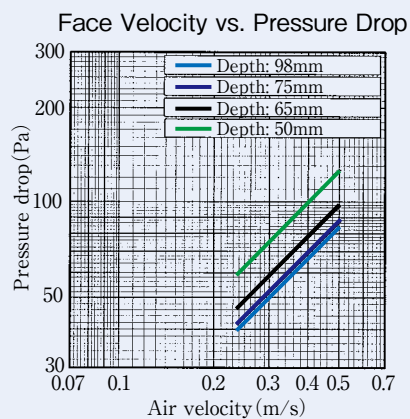
※ All model is approved by FM standard (Same performance)

### Dimension available

H (mm)	W (mm)
150 ~ 1220	150 ~ 1500

※ Faceguard should be on downstream side for reinforcement when filter height is between 916mm and 1220mm.

### Performance



## Atomos ATMML filter (ULPA filter)

※ Low gas emission type are also available.

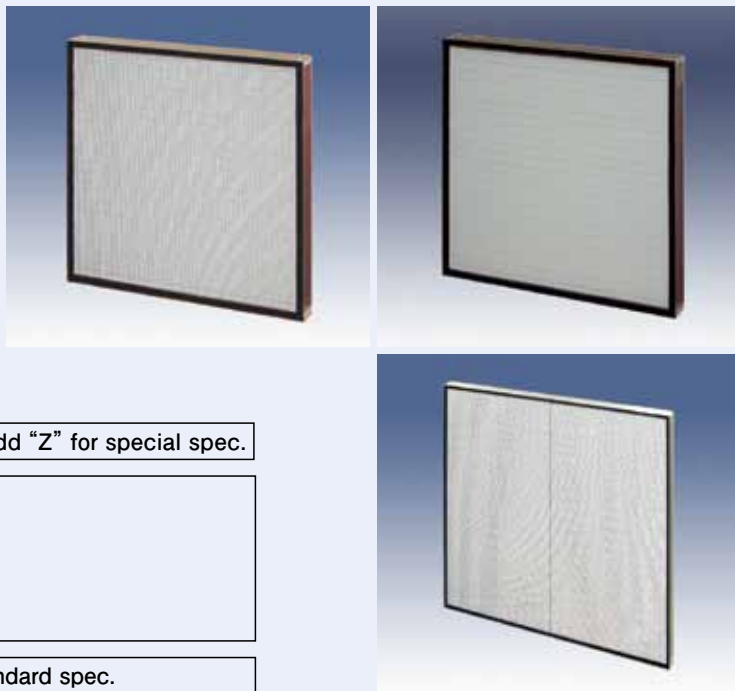
### Model

ATMML -  - E

Z : Add "Z" for special spec.

Frame code  
E38: Depth 98mm  
E23: Depth 75mm  
E41: Depth 65mm  
E25: Depth 50mm

Shows dimension: See Standard spec.  
("Z" stands for special spec.)



### Standard specification (sample)

Model	Dimension (mm) H × W × D	Rated air speed (m/s)	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)		Collection efficiency (%)	Weight (kg)
				Initial	Final		
ATMML - 10 - E38	610 × 610 × 98	0.5	10.0	103	294	99.9995 at 0.1 · 0.15 μm	4.5
ATMML - 20 - E38	610 × 1220 × 98		20.5				8.0
ATMML - 10 - E23	610 × 610 × 75		10.0	108			4.0
ATMML - 20 - E23	610 × 1220 × 75		20.5				7.0
ATMML - 10 - E41	610 × 610 × 65	0.35	10.0	128	99.999 at 0.1 · 0.15 μm	3.5	
ATMML - 20 - E41	610 × 1220 × 65		20.5			6.0	
ATMML - 7 - E25	610 × 610 × 50		7.0	3.0			
ATMML - 14 - E25	610 × 1220 × 50		14.5			5.0	

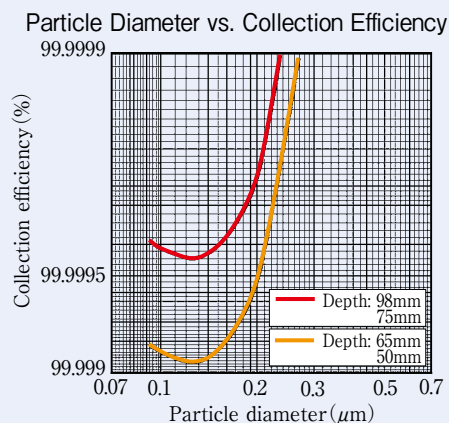
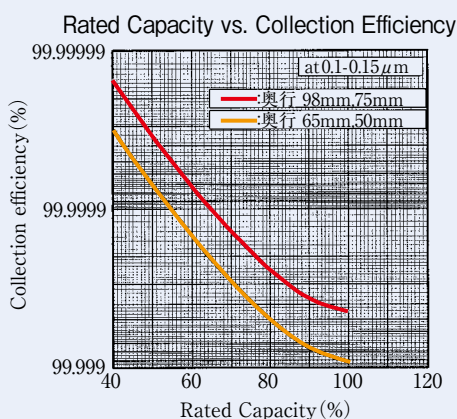
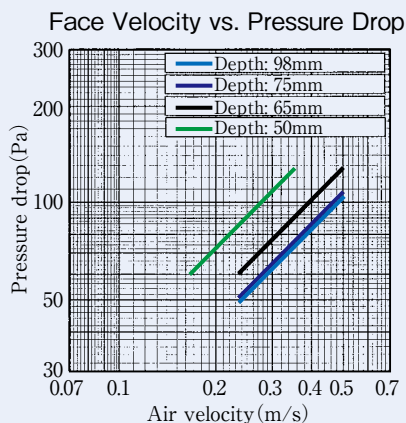
※ All model is approved by FM standard (Same performance)

### Dimension available

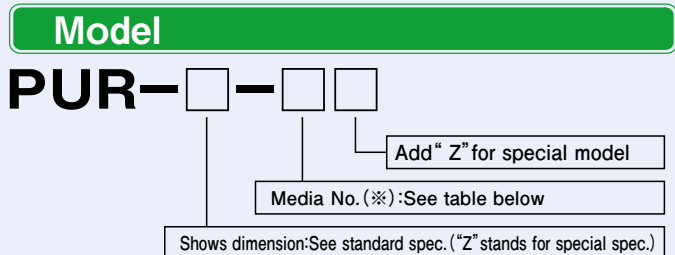
H (mm)	W (mm)
150 ~ 1220	150 ~ 1500

※ Faceguard should be on downstream side for reinforcement when filter height is between 916mm and 1220mm.

### Performance



## PureSmell filter (for AHU/MAU, EX processing)



### Standard specification

Model	Dimension (mm) H×W×D		Rated air volume (m³/min)	Pressure drop (Pa)	Gas removal efficiency (%)	SV value	Absorbent volume (L)
	Frame	Tray (element)					
PUR-56W - ※	610×610×630	590×600×45	56	About 167 / 265	About 90	29,000	116
PUR-56WH - ※	610×305×630	590×295×45	28				57
PUR-56 - ※	610×610×440	410×600×36	56	About 118 / 196	About 90	53,000	63
PUR-56H - ※	610×305×440	410×295×36	28				31
PUR-28 - ※	610×610×230	205×600×33	28	About 78 / 127	About 90	60,000	29
PUR-28H - ※	610×305×230	205×295×33	14				14

- 1: With pre/after filter model is available.
- 2: Dimension available (HxW): 610x610, 610x305, 305x610 and 305x305
- 3: Pressure: drop is depend on type of adsorbent. (Pellet/Grain)
- 4: Removal efficiency is influenced by air volume, target gases and temperature.
- 5: Model "PUR-56W" is long-lifetime model which has about 1.8times much volume than "PUR-56". This model is suitable to remove high concentration gases or use with mixed adsorbent.

### Types of adsorbent and target gases

Absorbent (※)	Additive	Base Material	Type	Target gases
E3	Potassium permanganate	Activated alumina	Pellet	Nitric oxide (NO), Sulfur oxide (SOx)
E5		Activated carbon	Grain	Sulfur oxide (SOx), Sulfur oxide (NO <sub>2</sub> )
E5H		High refined Activated carbon		Sulfur compound (Methyl sulfide, Methyl mercaptan)
F	Phosphoric acid	Zeolite	Pellet	Basic gases such as Ammonia, Amine etc.
F4		Activated carbon	Grain	
F4H		High refined Activated carbon		
A2	Calcium hydroxide	Zeolite	Pellet	Acid gases such as Hydrochloric acid, Nitric acid, Sulfuric acid, Acetic acid etc.
A3H	Potassium carbonate	High refined Activated carbon	Grain	Acetic acid (SO <sub>4</sub> <sup>2-</sup> , Cl <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , F <sup>-</sup> etc), Sulfur oxide (SOx), Sulfur compound (Hydrogen sulfide, Methyl sulfide, Methyl mercaptan)
O2	Manganese dioxide	Activated carbon	Pellet	Ozone, Chlorine, Organic solvent, Nitrogen oxide (NO <sub>2</sub> )
C	-	Activated carbon	Grain	Organic gases (Organic solvent) Nitrogen oxide

※ Adsorbent E5H / F4H has about 1.5times higher performance than E5 / F4, and suitable to remove low concentration gases.

### Filter media (adsorbent) appearance

Adsorbent	E3	E5, E5H, F4, F4H, A3H, C	F, A2	O2
Color phase	Purple	Black	White	Black
Photo				



## Materials and Temperature / Humidity

Materials			Temp. & Hum. (Recommend)	
Frame	Tray (element)	Media	Temperature (°C)	Humidity (%/RH)
Steel Plate (melamine baking paint)	Steel Plate (melamine baking paint)	Special absorbent	0~40	30~90

## Weight (representative value)

Model	Filter weight (kg)								Absorbent weight (kg)							
	O2	E5H, C	A3H	E5	E3, F4H	A2	F4	F	O2	E5H, C	A3H	E5	E3, F4H	A2	F4	F
PUR-56W -※	128	134	139	145	157	163	167	171	47	52	58	64	75	81	86	90
PUR-56WH-※	74	77	80	83	88	91	93	95	23	26	29	31	37	40	42	44
PUR-56 -※	74	77	80	83	90	93	95	97	25	28	32	35	41	44	47	49
PUR-56H -※	43	45	46	48	51	52	54	55	13	14	16	17	20	22	23	24
PUR-28 -※	39	41	42	44	47	48	49	50	12	13	14	16	19	20	21	22
PUR-28H -※	24	24	25	26	27	28	28	29	5	6	7	8	9	10	10	11

## Specification

### Gas removal efficiency

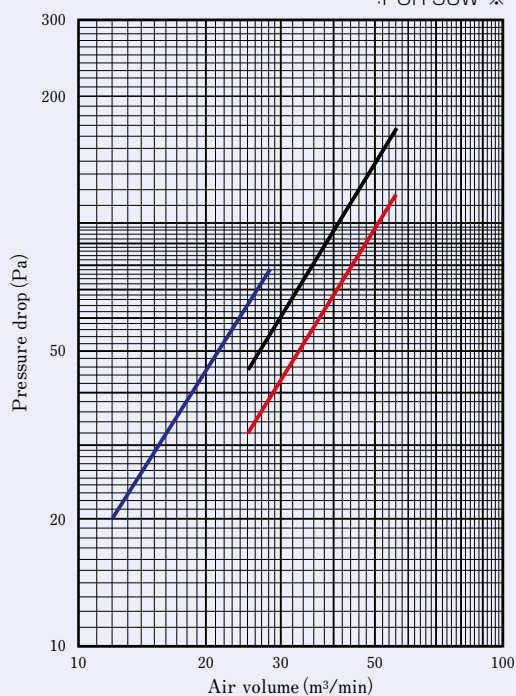
Type	Typical gases	E3	E5	E5H	F	F4	F4H	A2	A3H	O2	C
For acids	F <sup>-</sup> , CL <sup>-</sup> , NO <sub>2</sub> <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup>	○	○	○	-	-	-	◎	◎	-	-
Nitric oxide	NO	◎	-	-	-	-	-	-	-	-	-
Nitrogen oxide	NO <sub>2</sub>	-	○	○	-	-	-	-	○	○	○
Sulfur dioxide	SO <sub>2</sub>	△	◎	◎	-	-	-	△	○	-	-
Hydrogen sulfide	H <sub>2</sub> S	-	○	○	-	-	-	△	◎	-	-
Boron	B H <sub>3</sub> BO <sub>3</sub>	-	○	○	-	-	-	-	○	-	-
For Bases	NH <sub>3</sub> , NH <sub>4</sub> <sup>+</sup> Na <sup>+</sup> , K <sup>+</sup>	-	-	-	○	◎	◎	-	-	-	-
Organic gases	Low boiling point gases like toluene	-	-	-	-	-	-	-	-	○	◎
Organic gases	High boiling point gases like DOP	-	○	○	-	△	△	-	○	○	◎
Chlorine	CL <sub>2</sub>	-	△	△	-	-	-	-	△	◎	-
Ozone	O <sub>3</sub>	-	△	△	-	-	-	-	△	◎	○

◎:Very effective ○:Effective △:Removable - -:Scarcely removable

### Air Volume vs. Collection Efficiency (representative value)

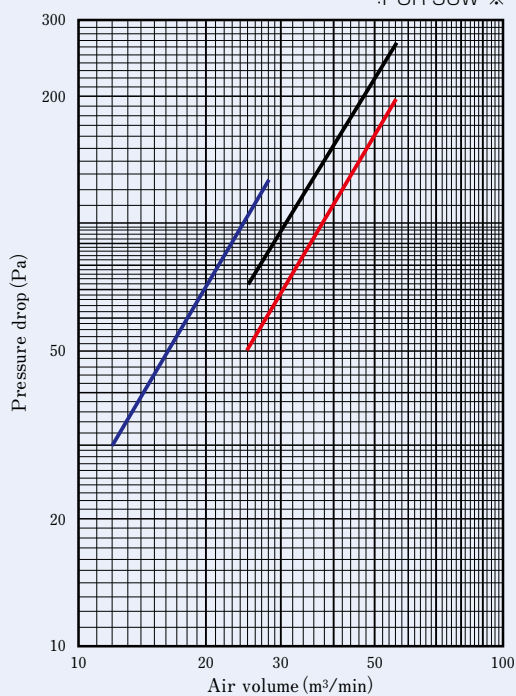
Pellet type adsorbent  
(E3, F, A2, O2)

— :PUR-28-※  
— :PUR-56-※  
— :PUR-56W-※



Grain type adsorbent  
(E5, E5H, F4, F4H, A3H, C)

— :PUR-28-※  
— :PUR-56-※  
— :PUR-56W-※

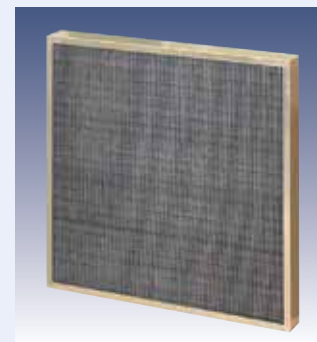


# lochemix

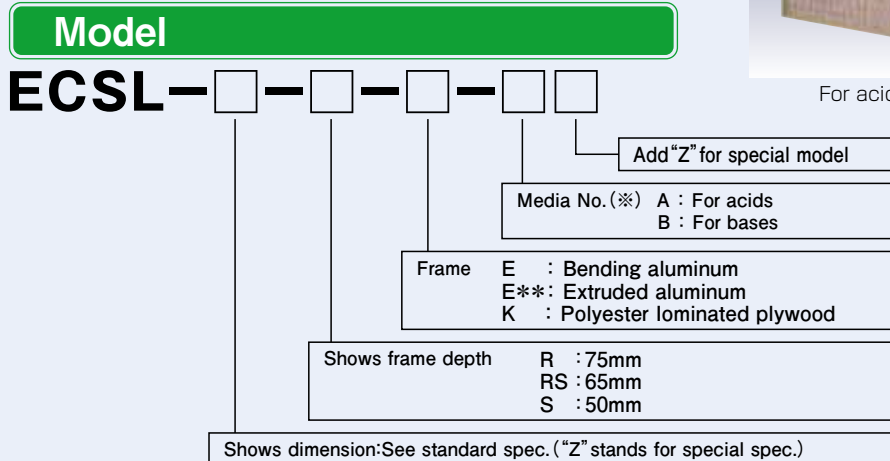
(for RA processing / Ion exchange resin media type)



For acids removal



For bases removal



## Standard specification

Model	Dimension (mm) Sealant H×W×D	Rated air volume (m³/min)	Rated face velocity (m/s)	Pressure drop (Pa)	Gas removal efficiency (%)	Weight (kg)
ECSL-10-R -E-※	610×610×75	10	0.5	About 35	About 90	6.0
ECSL-10-RS-E-※	610×610×65			About 20		5.0
ECSL- 7-S -E-※	610×610×50	7	0.35	About 12		4.5

※ Gas removal efficiency varies according to the used airspeed, type of gas being removed and temperature, so consult for specific situations.

## Materials and Temperature / Humidity

Materials				Temp. & Hum. (Recommend)	
Frame	Media	Ribbon	Sealant	Temperature (°C)	Humidity (%/RH)
Aluminum	Ion exchange resin	Hot melt	Polyurethane resin	0~40	30~90

## Dimension available

D	H	Q
50, 65, 75	150~1,220*1	1,500

※ 1 It will be 2pcs connected specification when height over 760mm

## Media type and target gases

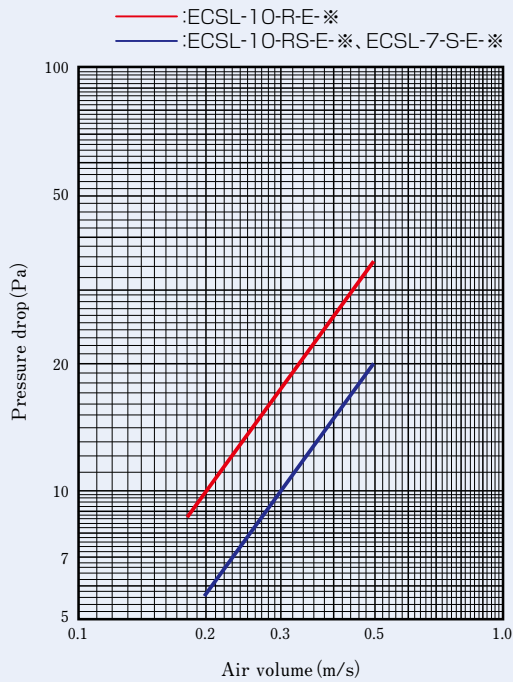
Media Type	Media		Target gases	
	Base material	Ion exchange group	Type	Example
A	Polystyrene resin	Quaternary ammonium group	For acids	Sulfur oxide (SOx), Hydrochloric acid, Hydrofluoric acid
B	Polystyrene resin	Sulfone acid group	For bases removal	Ammonia, Amine

## Specification

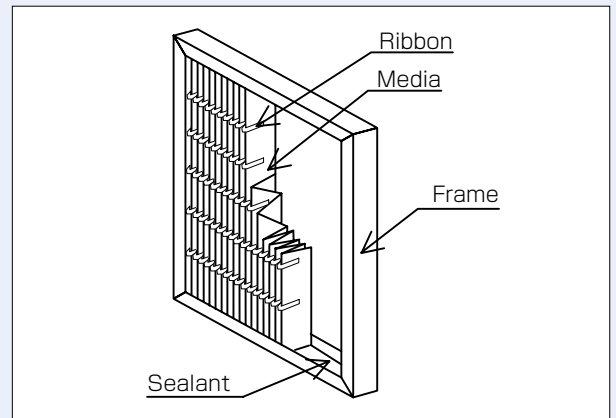
### Gas removal efficiency (Sample)

Type	Element		Concentration ( $\mu\text{g}/\text{m}^3$ )		Efficiency (%)	Measuring method	
	Name	Chemical formula	Up Stream	Down Stream			
A	For acids removing	Chloride Ion	$\text{Cl}^-$	3.7	0.3	92	IC
		Nitrite Ion	$\text{NO}_2^-$	4.8	0.8	83	
		Nitrate Ion	$\text{NO}_3^-$	1.2	0.3	75	
		Sulfate Ion	$\text{SO}_4^{2-}$	3.3	0.2	94	
		Boron	B	0.6	0.03	95	ICP-MS
B	For bases removing	Ammonium Ion	$\text{NH}_4^+$	4.5	0.15	97	IC

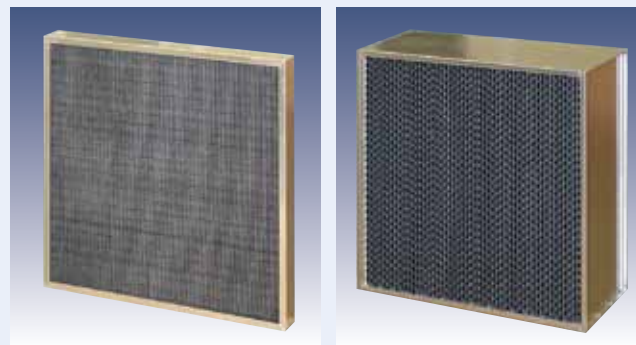
### Face Velocity vs. Pressure Drop (representative value)



### Structure drawing of filter (Mini pleats type)

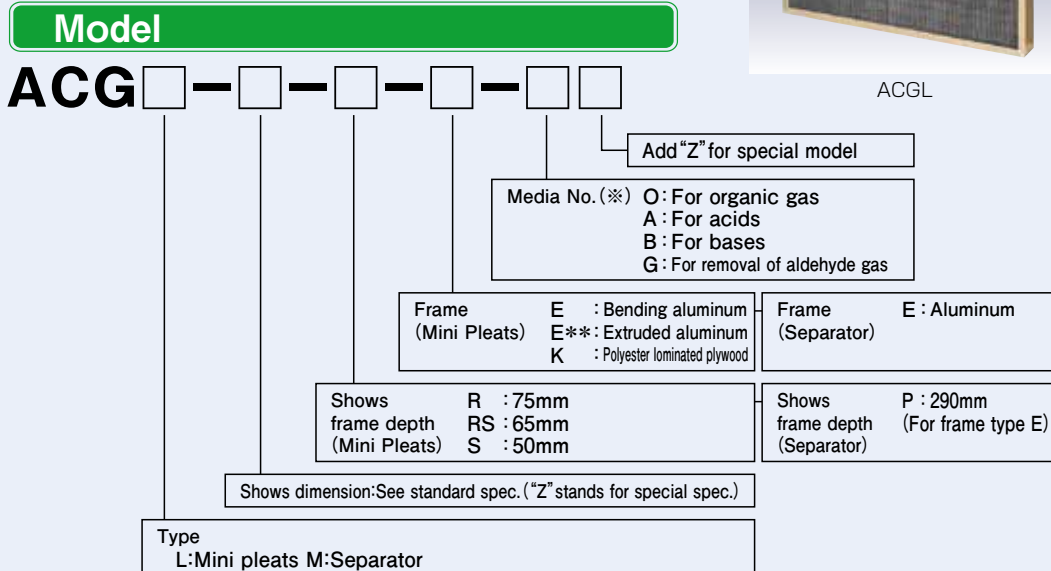


## PureChemix G (for RA processing / Granular activated carbon media type)



ACGL

ACGM



### Standard specification

Type	Model	Dimension (mm) H×W×D	Rated face velocity (m/s)	Rated air volume (m³/min)	Pressure drop (Pa)	Gas removal efficiency (%)	Weight (kg)
Mini Pleats	ACGL-10-R -E-※	610× 610× 75	0.5	10	About 40	About 90	5.5
	ACGL-20-R -E-※	610×1220× 75		20			10.5
	ACGL-10-RS-E-※	610× 610× 65		10	5.0		
	ACGL-20-RS-E-※	610×1220× 65	20	About 30	9.5		
	ACGL- 7-S -E-※	610× 610× 50	0.35	7	About 15		4.0
	ACGL-14-S -E-※	610×1220× 50		14			7.0
Separator	ACGM-56 -E42-※	610× 610×290	2.9	56	About 98	About 90	16.5
	ACGM-56H-E42-※	610× 305×290		28			9.5

※ Gas removal efficiency varies according to the used airspeed, type of gas being removed and temperature, so consult for specific situations.

### Materials and Temperature / Humidity

Type	Frame	Materials					Temp. & Hum. (Recommend)	
		Frame	Media	Separator	Ribbon	Sealant	Temperature (°C)	Humidity (%/RH)
Mini Pleats	E	Bending aluminum	Granular activated carbon	—	Hot melt	Polyurethane resin	0~40	30~90
	E**	Extruded aluminum						
	K	Polyester laminated plywood						
Separator	E**	Extruded aluminum		Aluminum	—			

### Dimension available

Shape	D	H	Q
Mini pleats	50, 65, 75	150~1,220※1	1,500
Separator	290	150~ 610	915

※1 It will be 2pcs connected specification when height over 760mm.

## Media type and target gases

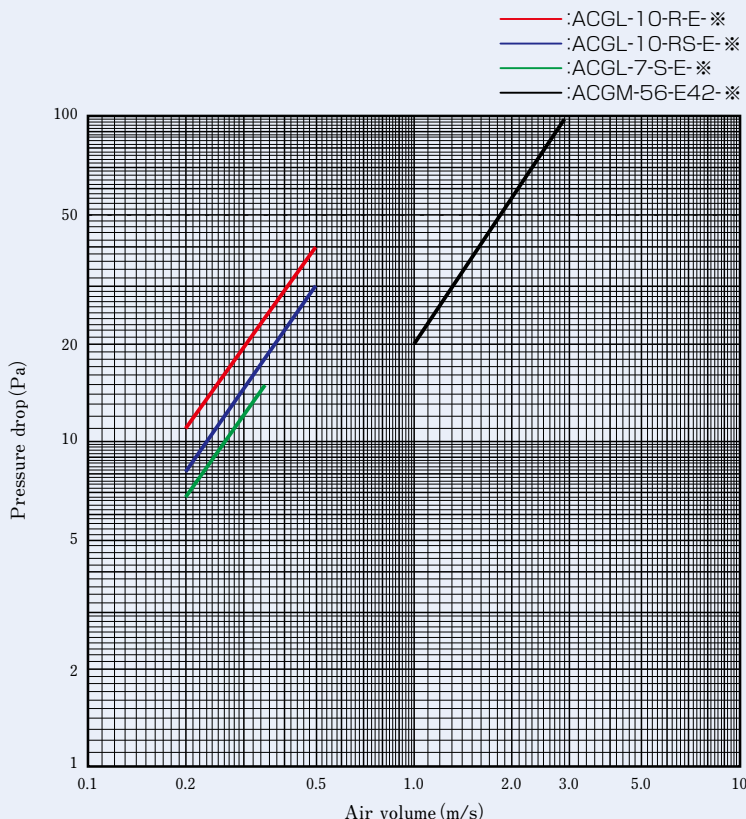
Media Type	Media		Type	Target gases	
	Base material	Additive		Example	
O	Granular activated carbon	—	For organic gases	Phtharic ester (DOP, BBP), Siloxane, OZ one, Phosphoric ester (TBP), Teluene	
A	Granular activated carbon	Potassium carbonate	For acids	Sulfar oxide (SOx), Hydro chloric oxide, Hydrofluoric acid, Boron	
B	Granular activated carbon	Phosphoric acid	For bases removal	Ammonia, Amine	
G	Granular activated carbon	Special	Aldehyde gas	Formaldehyde, Acetaldehyde	

## Specification

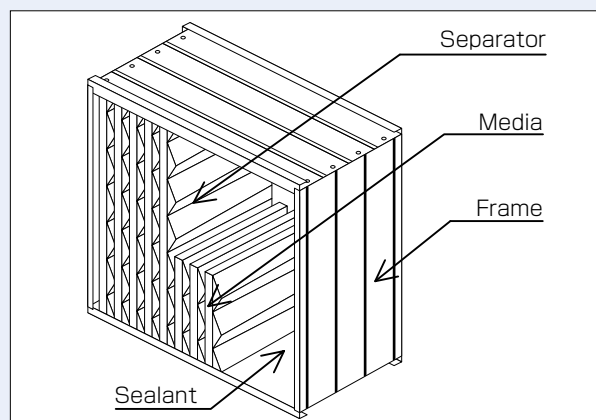
### Gas removal efficiency (Sample)

Type		Element		Mini pleat			Separator			Measuring method
				Concentration ( $\mu\text{g}/\text{m}^3$ )		Efficiency (%)	Concentration ( $\mu\text{g}/\text{m}^3$ )		Efficiency (%)	
				Up Stream	Down Stream		Up Stream	Down Stream		
O	Organic gases removal	Organic substance	—	8.4	0.05	99	10.5	0.4	96	GC-MS
A	For acids removal	Fluoride ion	$\text{F}^-$	1.0	0.02	98	1.0	0.03	97	IC
		Nitrite ion	$\text{NO}_2^-$	0.5	<0.01	98<	0.6	0.01	98	
		Nitrate ion	$\text{NO}_3^-$	0.1	<0.01	90<	0.1	<0.01	90<	
		Sulfate ion	$\text{SO}_4^{2-}$	0.2	0.01	95	0.2	<0.01	95<	ICP-MS
		Boron	B	0.3	0.01	97	0.3	0.01	97	
		Acetic acid	$\text{CH}_3\text{COOH}$	9.3	0.20	98	8.9	0.28	97	
B	For bases removal	Formic acid	$\text{HCOOH}$	0.15	<0.01	93<	0.12	<0.01	92<	IC
		Ammonium ion	$\text{NH}_4^+$	3.5	<0.05	99<	4.5	0.15	97	
G	For removal of aldehyde gas	Formaldehyde	$\text{HCHO}$	98	<1	99<	—	—	—	HPLC
		Acetaldehyde	$\text{CH}_3\text{CHO}$	48	<4	92<	—	—	—	

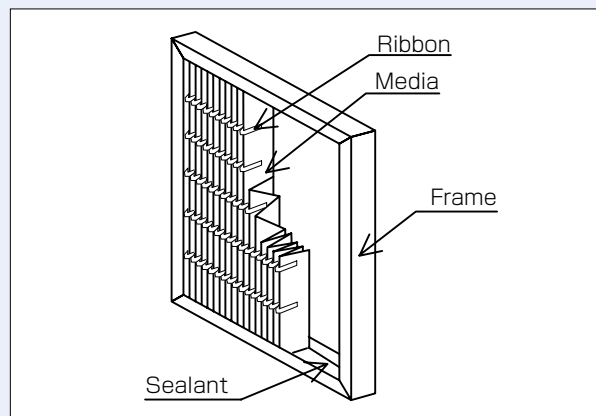
### Face Velocity vs. Pressure Drop (representative value)



### Structure drawing of filter (Separator type)



### Structure drawing of filter (Mini pleats type)

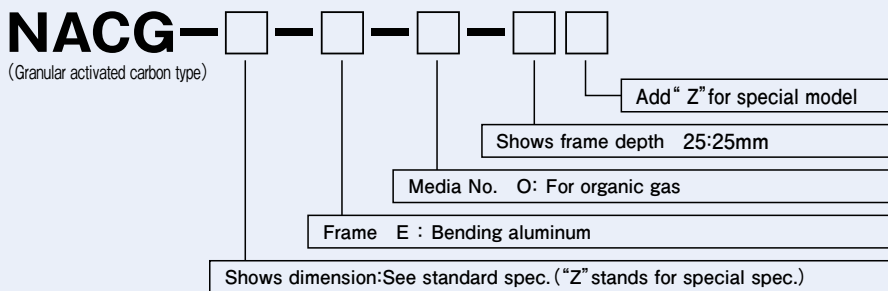
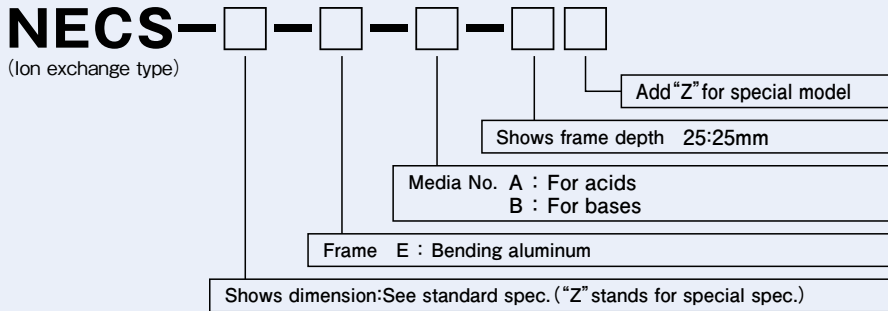


# Thin type chemical filter

(Thin type for processing circulation air)



## Model



## Standard specification

Model	Dimension (mm) <sup>*1</sup> H×W×D	Rated face velocity (m/s)	Rated air volume (m <sup>3</sup> /min)	Pressure drop (Pa)	Gas removal efficiency <sup>*2</sup> (%)	Weight (kg)
NECS-7-E-A-25	610×610×25	0.35	7	About 10	About 90	About 2.5
NECS-7-E-B-25	610×610×25	0.35	7	About 10	About 90	About 2.5
NACG-7-E-O-25	610×610×25	0.35	7	About 15	About 90	About 2.5
NACG-7-E-A-25	610×610×25	0.35	7	About 15	About 90	About 2.5
NACG-7-E-B-25	610×610×25	0.35	7	About 15	About 90	About 2.5
NACG-7-E-G-25	610×610×25	0.35	7	About 15	About 90	About 2.5

※1 Other dimensions are available.

※2 Gas removing efficiency depends on air velocity, type and temperature of removing gas.

## Materials and Temperature / Humidity

Materials			Temp. & Hum. (Recommend)	
Media	Frame	Sealant	Temperature (°C)	Humidity (%/RH)
Granular activated carbon, Ion exchange resin	Aluminum	Polyurethane resin	0~40	30~90

## Dimension available

D	H	Q
25	150~610	150~760

## Media type and target gases

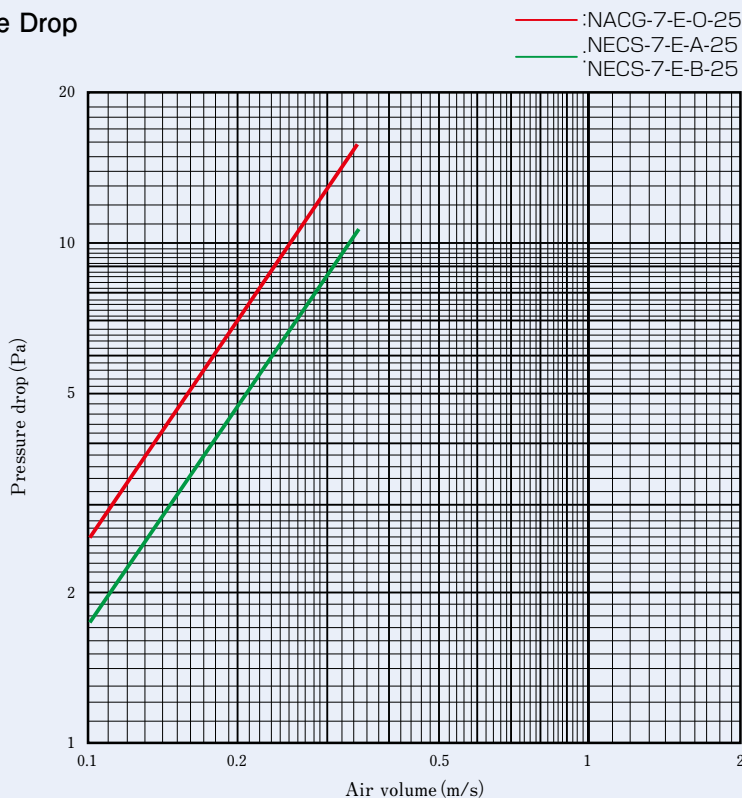
Media Type	Media		Target gases		
	Base material	Additive / Functional group	Type	Example	
NECS	A	Polyethylene resin	Quaternary ammonium group	For acids	Sulfur oxide (SOx), Hydrochloric oxide, Hydrofluoric acid, Boron
	B	Polyethylene resin	Sulfone acid group	For bases removal	Ammonia, Amine
NACG	O	Granular activated carbon	—	For organic gases	Phthalic ester (DOP, BBP), Siloxane, OZ one, Phosphoric ester (TBP), Toluene
	A	Granular activated carbon	Potassium carbonate	Acidic gas	Sulfur oxide (SOx), Hydrochloric oxide, Hydrofluoric acid, Boron
	B	Granular activated carbon	Phosphoric acid	Alkaline gas	Ammonia, Amine
	G	Granular activated carbon	Special adhesive	Aldehyde	Formaldehyde, Acetaldehyde, Toluene

## Specification

### Gas removal efficiency (Sample)

Type	Element		Concentration ( $\mu\text{g}/\text{m}^3$ )		Efficiency (%)	Measuring method	
	Name	Chemical formula	Up Stream	Down Stream			
A	For acids removal	Nitrite ion	$\text{NO}_2^-$	2.5	<0.2	92<	IC
		Sulfate ion	$\text{SO}_4^{2-}$	3.1	0.2	93	
		Boron	B	72	5	93	
B	For bases removal	Ammonium ion	$\text{NH}_4^+$	14.0	0.4	97	IC
O	Organic gases removal	Organic substance	—	66.0	<0.1	99<	GC-MS
G	For removal of aldehyde	Formaldehyde	HCHO	120	<0.2	99<	HPLC

### Face Velocity vs. Pressure Drop



## 4. Technical term explanation

### 1. Technical term for gas concentration

(1) %, ppm, ppb, ppt

These terms represent ratio of volume / volume, mass / mass and others.

For gas concentration in atmosphere, these generally represent "volume of target gases / volume of atmosphere"

%	(per cent)	:10 <sup>-2</sup>
ppm	(parts per million)	:10 <sup>-6</sup>
ppb	(parts per billion)	:10 <sup>-9</sup>
ppt	(parts per trillion)	:10 <sup>-12</sup>

(2) mg/m<sup>3</sup>, μg/m<sup>3</sup>, ng/m<sup>3</sup>, μg/L, ng/L, pg/L

These terms represent mass / volume.

For gas concentration in atmosphere, these represent "volume of target gases / volume of atmosphere"

mg/m <sup>3</sup>	=	μg/L
μg/m <sup>3</sup>	=	ng/L
ng/m <sup>3</sup>	=	pg/L

Prefix of unit

Multiplier	Prefix	Name
10 <sup>12</sup>	T	T (Tera)
10 <sup>9</sup>	G	G (Giga)
10 <sup>6</sup>	M	M ( Mega)
10 <sup>3</sup>	k	k (Kilo)
10 <sup>2</sup>	h	h (Hecto)
10 <sup>-2</sup>	c	c (Centi)
10 <sup>-3</sup>	m	m (Milli)
10 <sup>-6</sup>	μ	μ (Micro)
10 <sup>-9</sup>	n	n (Nano)
10 <sup>-12</sup>	p	p (Pico)

### 2. Conversion method of gas concentration (ppb↔μg/m<sup>3</sup>)

Conversion between concentration of volume / volume and concentration of weight / volume can be calculated with calculation below by using molecular weight and molar volume of ideal gas at 0°C, 1 atm.

$$Y(\mu\text{g}/\text{m}^3) = \frac{X(\text{ppb}) \times M(\text{g}/\text{mol})}{22.4(\text{L}/\text{mol}) \times K}$$

$$K = (273 + T) / 273$$

X	: Figure at ppb unit
Y	: Figure at μg/m <sup>3</sup> unit
M	: Molecular weight of target gas
22.4	: Molar volume of ideal gas at 0°C, 1atm
K	: Correct coefficient by temperature
T	: Temperature of atmosphere (°C)

Conversion example of gas concentration (at 23°C)

Tartet gases			1 ppb → Y μg/m <sup>3</sup>	1 μg/m <sup>3</sup> → X ppb
Name	Chemical formula	Molecular weight		
Fluoride ion	F <sup>-</sup>	19.0	0.78	1.28
Chloride ion	Cl <sup>-</sup>	35.5	1.46	0.68
Nitrite ion	NO <sub>2</sub> <sup>-</sup>	46.0	1.89	0.53
Nitrate ion	NO <sub>3</sub> <sup>-</sup>	62.0	2.55	0.39
Sulfate ion	SO <sub>4</sub> <sup>2-</sup>	96.0	3.95	0.25
Boron	B	10.8	0.44	2.25
Ammonium ion	NH <sub>4</sub> <sup>+</sup>	18.0	0.74	1.35
Toluene	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	92.0	3.79	0.26

※T=at 23°C

### 3.SV value ( Space Velocity)

SV represents ventilated air volume per volume of adsorbent (see calculation below), to show conditions of adsorbent loaded type chemical filter. When SV is lower, this means ventilated air contact to adsorbent longer, so removal efficiency of the filter become higher. In case of processing same concentration gases, service lifetime become longer because ventilated air volume is smaller (Correspond to air velocity for mini-pleats type chemical filter).

$$SV(1/h) = \frac{\text{ventilated air volume} [\text{m}^3/h]}{\text{filled volume of adsorbent} [\text{m}^3]}$$

SV should be small when processing high concentration gases, high efficiency is required and long lifetime is needed (Please refer us for details).



## 5. Target gas and features

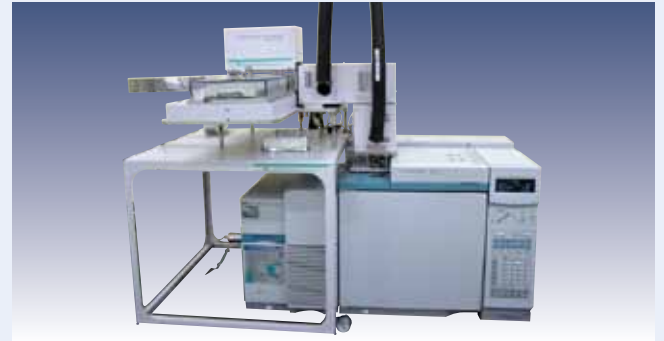
### MUKI Inspection Devices

#### Ion Chromatograph (IC)



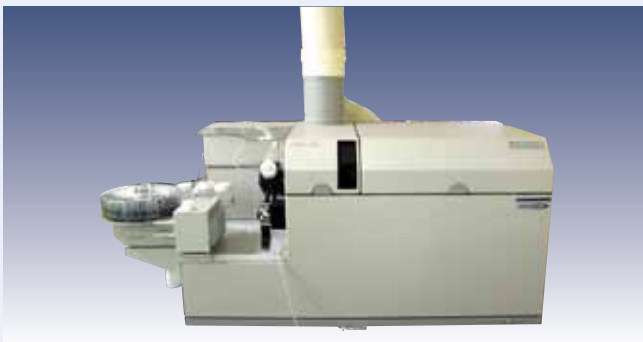
- ◎ Measurement of acid, alkali, and organic acid density in liquid ( $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{CH}_3\text{COO}^-$  etc.)
- ◎ Measurement of acid, alkali, and organic acid density in air
- ◎ Measurement of acid, alkali, and organic acid removal efficiency of the filter
- ◎ Measurement of acid, alkali, and organic acid density dissolution volume from the component

#### Gas chromatograph-mass spectrometer (TD-GC-MS)



- ◎ Measurement of organic matter density in air (siloxane / DBP / DOP, etc.)
- ◎ Measurement of organic matter removal efficiency of the filter
- ◎ Measurement of amount of organic matter generated from the filter and the component

#### Inductively-coupled plasma mass spectrometer (ICP-MS)



- ◎ Measurement of metal composition density in liquid (B, P, Ca, Cu, Al, etc.)
- ◎ Measurement of metal composition density in air
- ◎ Measurement of metal composition removal efficiency of the filter
- ◎ Measurement of amount of metal composition generated from the filter

#### Silicon wafer analyzer gas chromatograph-mass spectrometer (WTD-GC-MS)



- ◎ Measurement of amount of organic matter adhering to the surface of wafer
- ◎ Determining the relationship between organic matter density in the air and amount of wafer contamination
- ◎ Measurement of amount of organic material generated from the filter

## 6. Handling Manual

### 1. During transport

When transporting filters, please exercise care regarding the following matters.

- (1) When lifting the filter, securely hold the carton with both hands, making sure the direction markings (this side up, etc.) on the box are followed. Do not carry it on your shoulders.
- (2) When unloading the filter, set it down gently. If dropped, the frame or filter media may be damaged. If dropped by accident, open the carton and check for damage.
- (3) When loading the filter on a truck, etc., never place the carton on its side. Place the carton according to the direction markings clearly displayed on the carton. Do not stack more than 3 cartons high.
- (4) Although the filter is designed to withstand vibrations while in transit by truck, etc., avoid traveling on rough roads for an extended period. Keep the product dry. Use trucks which are equipped to prevent the product from getting wet or from rain.

### 2. Storage

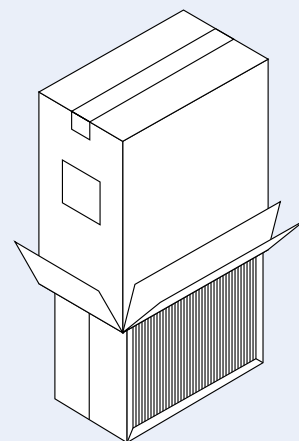
When storing the filters, please exercise care regarding the following matters.

- (1) Do not place the carton directly on the floor. Use a pallet to allow space between the filter and the floor.
- (2) Avoid high temperatures and high humidity, and store under normal humidity and temperature conditions (storage temperature 0-40 °C, storage relative humidity 30-90%, no condensation). Store in a well-ventilated warehouse without leaks, and avoid direct sunlight and contact with water.
- (3) Never place the carton on its side. Place the carton according to the direction markings clearly displayed on the carton. Do not stack more than 3 cartons high.
- (4) Store the filter in its original carton. If the filter has been opened, repack the filter in a PE bag, and tightly seal the bag.
- (5) Filters for out gas (Low boron, Nouvelle) can be contaminated by outside air. Do not leave open filters exposed for an extended period of time.
- (6) The storage limit is 1 year. If a filter has been stored for over 1 year, check its performance before use.

### 3. Installation

When installing the filters, please exercise care regarding the following matters.

- (1) When removing the filter from the carton, lift the carton upward as illustrated in the figure on the right to avoid possible damage to the filter.
- (2) Damage to the filter pack often occurs when the filter is moved or installed. Even if there is a media guard such as a mesh lath, grasp only the frame.
- (3) Never sit or stand on the filter. When the filter is installed in a hard to reach place, it may be easy use it as a stepping stool, but it is easily damaged.
- (4) Do not climb on the filter as this will cause damage or breakage, and may also result in physical injury.
- (5) When installing the filter in a horizontal chamber, be sure to install the filter so that the top of the media will be in the upward direction.
- (6) Install filter according to the displayed air flow direction, as instructed.
- (7) When fastening a filter with a gasket, tighten all the gaskets evenly. The gasket should be tightened to approximately 2/3 of its depth. Do not remove the filter once installed, except for replacement. (if crimping is repeated, durability of the gasket will be reduced, and may leak.)
- (8) In some cases, the filter is shipped in a PE bag or a PE sheet is attached to the filter to avoid contamination until ventilation (use). Please remove the PE bag or PE sheet before use. If ventilated is carried out without removing the PE bag or sheet, the filter or fan may be damaged.



### 4. Use

- (1) After installation of the filter, let it idle.
- (2) Turn on/off airflow gradually. Do not abruptly change the airflow on or off.
- (3) Once ventilation begins, keep a record of the initial pressure drop.
- (4) Use at an airflow which is lower than it is rated for. Even at a lower rated airflow, damage may occur if air hits the filter locally. Use rectified air for ventilation.
- (5) To maximize the efficiency of out gas countermeasure filters (Low boron, Nouvelle), use with a chemical filter is recommended.

### 5. Disposal

Discard filter as industrial waste.



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## NIPPON MUKI CO.,LTD.

Head Office  
Nisshin Ueno Bldg., 5-1-5, Higashi-ueno, Taito-ku, Tokyo, 110-0015, Japan Tel. +81-3-6860-7500

Tohoku Office  
Sampo Japan Sendai KY Bldg., 3-10-19, Chuo, Aoba-ku, Sendai, Miyagi, 980-0021 Japan Tel. +81-22-266-7531

Osaka Office  
OX Yodoyabashi Bldg., 4-4-9, Fushimi-cho, Chuo-ku, Osaka, 541-0044 Japan Tel. +81-6-6201-3751

Chubu Office  
Nagoya Joho Center Bldg., 2-2-17, Sakae, Naka-ku, Nagaoya, Aichi, 460-0008 Japan Tel. +81-52-202-9911

Kyushu Office  
ND Bldg., 1-4-1, Daimyo, Chuo-ku, Fukuoka City, 810-0041 Japan Tel. +81-92-715-1651

Hiroshima Office  
Otemachi Center Bldg., 2-8-5, Otemachi, Naka-ku, Hiroshima, 730-0051 Japan Tel. +81-82-248-3920

Nippon Muki (Suzhou) Co., Ltd.  
No.116, Changyang Street SIP, Suzhou, 215126 China Tel. +86-512-6507-7780

<http://www.nipponmuki.co.jp/>