

PRODUCT OVERVIEW

THE EBRAFILTER

The Ebrafilter[®] is a combination chemical and particulate filter that integrates Ebrafil[®] patented dry-scrubbing media into a nonwoven fiber matrix. Ebrafilters can replace existing particulate filters in retrofit or rework applications as well as in new construction applications where building codes and standards require outdoor air cleaning for PM₁₀, PM_{2.5}, and ozone. The integrated sodium permanganate and activated carbon media add chemical filtration while providing the same level of particulate control.

Typical Applications: Commercial environments including hotels, airports, office buildings, data centers, schools, casinos, restaurants, museums, and athletic stadiums.

Longer Service Life: The Ebrafilter offers a higher media loading capacity and up to ten times the removal capacity of other chemical filters.

Superior Efficiency: The Ebrafilter offers the highest removal efficiencies and eliminates a broader range of odors and common indoor pollutants.

Easy Life Testing: The Ebrafilter can be tested to determine remaining service life. Ebrafil's filter monitoring program assures ongoing compliance with the Indoor Air Quality Procedure of ASHRAE Standard 62.1.

Permanent Odor Removal: The Ebrafilter will not desorb like traditional activated carbon filters and removes gases through an irreversible chemical reaction process.



COMMERCIAL GRADE SPECIFICATIONS

Pressure drop 2 inch	0.51 iwg
Pressure drop 4 inch	0.43 iwg

HEAVY-DUTY GRADE SPECIFICATIONS

Pressure drop 12 inch	0.47 iwg
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OPERATING RANGE

Temperature	4° F to 125° F (-20° C to 51° C)
Airflow	up to 500 ft/min (2.54 m/sec)

CONSTRUCTION

Chemical Media	7 media blends available
Frame	Paper, galvanized, or aluminum
Particulate Media	F5(MERV 8) and F8(MERV 15) available
Size	Available in all filter sizes

* Minimum Efficiency Reporting Value (MERV) in compliance with ANSI/ASHRAE Standard 52.2-2012. MERV 8 removes 35% of particulates as small as 3 µm (mold/spores). MERV 15 removes 85% of particulates as small as 0.3 µm (bacteria/smoke).

PRECISE TECH COMPANY LIMITED

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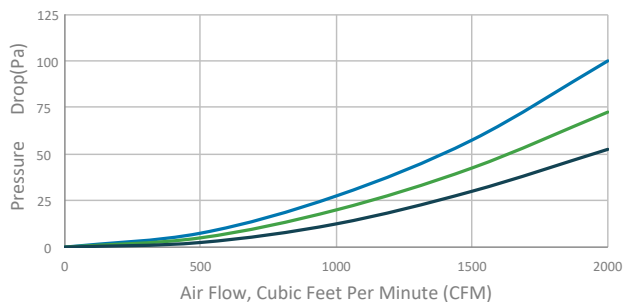
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PRODUCT SPECIFICATIONS

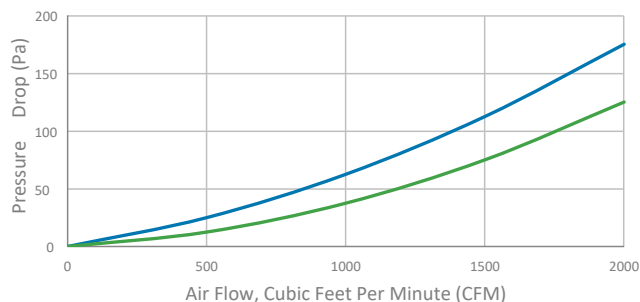
THE EBRAFILTER

Ebrafilter Pressure Drop

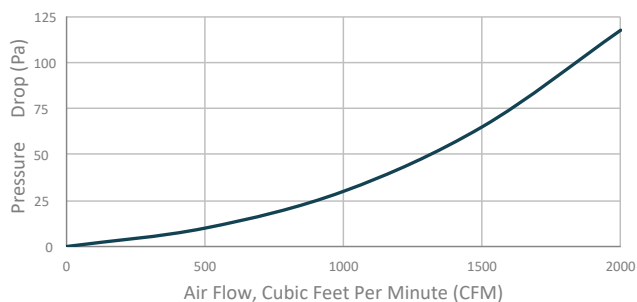
Plain Media



MERV 8

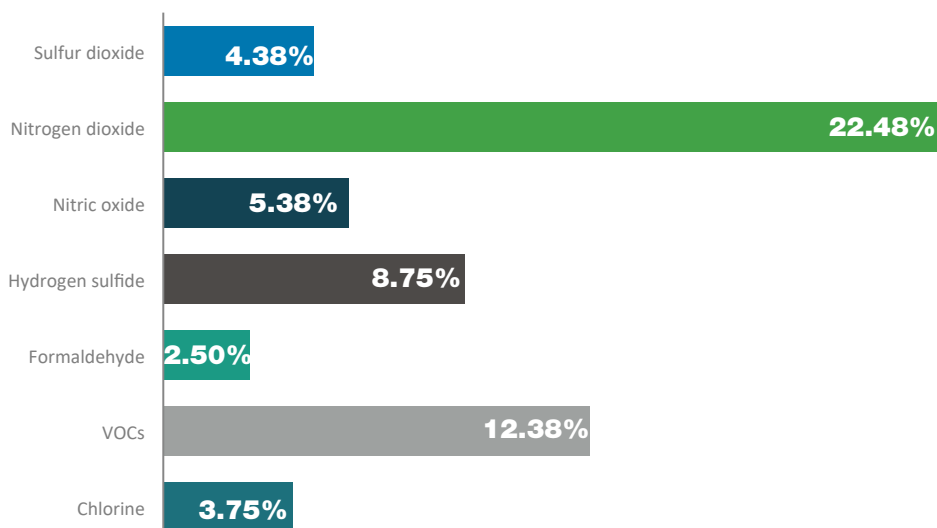


MERV 15



Legend

- 50 mm Filter
 - 102 mm Filter
 - 305 mm Filter
- (iwg) Inches Water Gauge



* Removal capacity by weight. For example, 10 pounds (4.54 kg) of Ebrafil SP Blend will remove a minimum of 2.25 pounds (1.02 kg) of Nitrogen Dioxide. SP Blend media is a 50/50 blend composed of Ebrafil SP (sodium permanganate, activated alumina), and Ebrakol® (activated carbon).

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PRODUCT BULLETIN

THE EBRAFILTER

Product Overview:

- Up to 10x the removal capacity of other chemical filters
- Combination chemical and particulate filter that integrates Ebrafil® patented media into a particulate filter
- Particulate Rating: G4, H5, F8
- Available in 50 mm, 102 mm and 305 mm depths
- Available Frames: Fiberboard, Galvanized Steel & Aluminum
- Outdoor air cleaning for PM₁₀, PM_{2.5} and ozone
- Sodium permanganate and activated carbon
- Ideal for use in:
 - Hotels & Casinos
 - Airports
 - Office Buildings
 - Data Centers
 - Schools & Stadiums
 - Restaurants
 - Museums



Why Ebrafilter?

- Offers a higher media loading capacity than other chemical filters
- Can be tested to determine remaining service life
- Will not desorb like carbon filters
- Removes gases through chemisorption, an irreversible chemical reaction process

PERFORMANCE DATA (24 x 24)

FILTER DEPTH (in)	INITIAL RESISTANCE (i.w.g.) @ 500 fpm	FINAL RESISTANCE (i.w.g.)	MERV @ 500 fpm
2"	0.51	1.0	8
4"	0.43	1.0	8
12"	0.47	1.0	15

INTERNATIONAL PERFORMANCE DATA (610 x 610)

FILTER DEPTH (mm)	INITIAL RESISTANCE (Pas.) @ 2.5 mps	FINAL RESISTANCE (Pas.)	IEC @ 2.5 mps
50	127.0	249.0	F5
102	107.1	249.0	F5
305	117.1	249.0	F8

* Minimum Efficiency Reporting Value (MERV) in compliance with ANSI/ASHRAE Standard 52.2-2012. MERV 8 removes 35% of particulates as small as 3 µm (mold/spores). MERV 15 removes 85% of particulates as small as 0.3 µm (bacteria/smoke).

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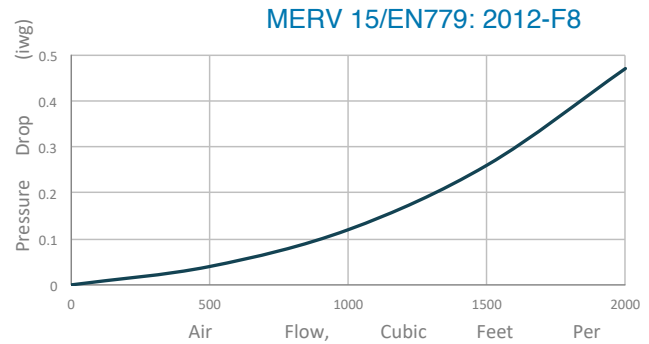
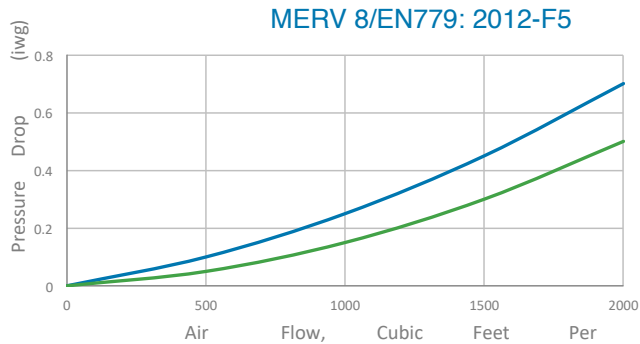
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PRODUCT SPECIFICATIONS

THE EBRAFILTER

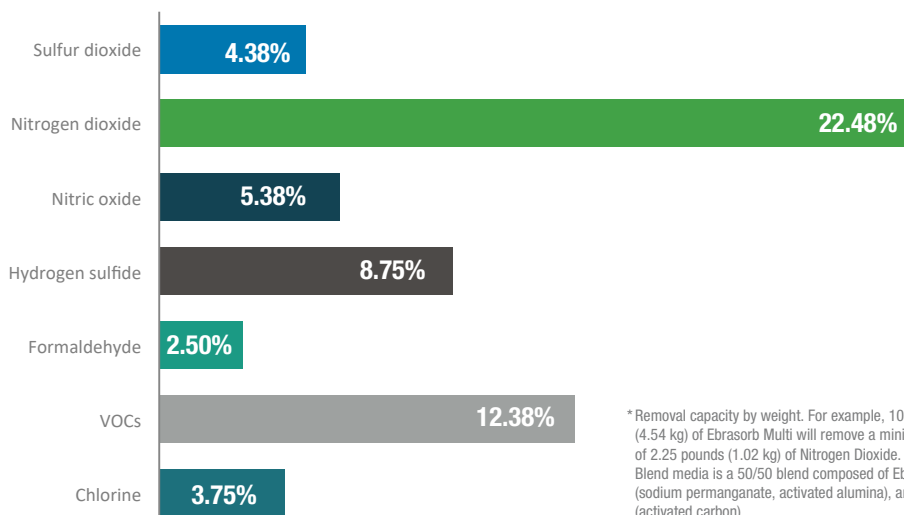
Ebrafilter Pressure Drop



Legend

50 mm Filter 102 mm Filter 305 mm Filter

Removal Capacity of Ebrasorb Multi*



*Removal capacity by weight. For example, 10 pounds (4.54 kg) of Ebrasorb Multi will remove a minimum of 2.25 pounds (1.02 kg) of Nitrogen Dioxide. SP Blend media is a 50/50 blend composed of Ebrasorb (sodium permanganate, activated alumina), and Ebrakol (activated carbon).

Engineering Specifications

COMMERCIAL GRADE SPECIFICATIONS (MERV 8*)

Pressure drop 50 mm	127 Pa
Pressure drop 102 mm	107 Pa

HEAVY-DUTY GRADE SPECIFICATIONS (MERV 15*)

Pressure drop 305 mm	117 Pa
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OPERATING RANGE

Temperature	4° F to 125° F (-20° C to 51° C)
Airflow	up to 500 ft/min (2.54 m/sec)

CONSTRUCTION

Chemical Media	7 media blends available
Frame	Paper, galvanized, or aluminum
Particulate Media	F5(MERV 8) and F8(MERV 15) available
Size	Available in all filter sizes

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PRODUCT OVERVIEW

THE EBRAFIL V-BANK

Product Overview:

- Exceptionally strong lightweight filter
- Superior for corrosion resistance
- Ideal for use in odor control applications where higher levels of contaminant would overwhelm combination filters
- Available with Ebrafil Commercial Blends:
 - Kitchen Odor & Smoke
 - Jet & Diesel Exhaust
 - Outdoor Pollution & Corrosion
 - Bathroom Odor & Ammonia
- Excellent gas phase filter for recirculated air applications
- Over 20 pounds of media in a 610X610X305 mm filter
- Single header allows for use in almost all 305 mm installations
- Deep V-format for additional surface area
- Built-in handle for easy handling and installation
- Disposable, easy to use, low service cost



EBRAFIL COMMERCIAL BLENDS

KITCHEN ODOR & SMOKE

- Broad spectrum removal of many common kitchen odors and smoke, including burnt foot, cheese, mold, tobacco and fire smoke
- 500 grams/sq meter media loading
- Works with chemisorption and physiosorption

JET & DIESEL EXHAUST

- Specially designed to remove a wide array of exhaust gases at high efficiency
- 500 grams/sq meter media loading
- Works with chemisorption and physiosorption

BATHROOM ODOR & AMMONIA

- Synergistic blend of media that captures and removes common odors associated with bathrooms, including urine and ammonia
- 500 grams/sq meter media loading
- Works with chemisorption

OUTDOOR POLLUTION & CORROSION

- Proprietary blend engineered to provide enhanced neutralization of outdoor pollution that can cause corrosion and health effects
- 600 grams/sq meter media loading
- Works with chemisorption

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PRODUCT SPECIFICATION

THE EBRAFIL V-BANK

JET & DIESEL EXHAUST

PART NUMBER*	NOMINAL SIZE (H" x W" x D")	INITIAL RESISTANCE @ 500 fpm (Pa)	MEDIA WEIGHT (PER FILTER)	SHIPPING WEIGHT
VBNK-EXST-12	305 x 610 x 305	128	5	16
VBNK-EXST-20	508 x 610 x 305	128	9	27
VBNK-EXST-24	610 x 610 x 305	128	11	32

BATHROOM ODOR & AMMONIA

PART NUMBER*	NOMINAL SIZE (H" x W" x D")	INITIAL RESISTANCE @ 500 fpm (Pa)	MEDIA WEIGHT (PER FILTER)	SHIPPING WEIGHT
VBNK-BATH-12	305 x 610 x 305	90	6.3	19
VBNK-BATH-20	508 x 610 x 305	90	11.8	33
VBNK-BATH-24	610 x 610 x 305	90	14.5	40

OUTDOOR POLLUTION & CORROSION

PART NUMBER*	NOMINAL SIZE (H" x W" x D")	INITIAL RESISTANCE @ 500 fpm (Pa)	MEDIA WEIGHT (PER FILTER)	SHIPPING WEIGHT
VBNK-POLL-12	305 x 610 x 305	90	5.9	18
VBNK-POLL-20	508 x 610 x 305	90	10.4	30
VBNK-POLL-24	610 x 610 x 305	90	12.7	37

KITCHEN ODOR & SMOKE

PART NUMBER*	NOMINAL SIZE (H" x W" x D")	INITIAL RESISTANCE @ 500 fpm (Pa)	MEDIA WEIGHT (PER FILTER)	SHIPPING WEIGHT
VBNK-KIT-12	305 x 610 x 305	128	5	16
VBNK-KIT-20	508 x 610 x 305	128	9	27
VBNK-KIT-24	610 x 610 x 305	128	10.9	32

Engineering Specifications

1.0 General

- 1.1 Filters shall be Ebrafil V-Bank air filters as manufactured by Ebraco
- 1.2 Filters shall be available in nominal depths of 305 mm only
- 1.3 Filters are manufactured by an ISO 9001 registered company

2.0 Filter Materials of Construction

- 2.1 Media shall be 3/4" honeycomb media packs filled with Ebrafil's proprietary blends of media designed for common gases of concern found in office, airport or healthcare applications

2.2 Frame shall be a high impact plastic with a built in header on top and bottom

2.3 Filter media pack shall be adhered and sealed to frame with polyurethane to prevent by-pass

3.0 Filter Performance

- 3.1 For initial resistance of filters, see Performance Data chart
- 3.2 Filters shall be rated to withstand a continuous operating temperature

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PRODUCT OVERVIEW

- MERV 8
- Available in 50 mm & 102 mm depths
- Durable fiberboard frame
- Ideal for use in
 - Hotels & Casinos
 - Airports
 - Office Buildings
 - Data Centers
 - Schools & Stadiums
 - Restaurants
 - Museums
 - Wildfires



Advanced Odor Control EbraFilter[™]

WHY THE AOC EBRAFILTER?

- Offers a higher media loading, with up to 10x the removal capacity of other molecular filters
 - Removes gases through chemisorption, an irreversible chemical reaction process. Will not desorb like carbon filters
 - Combination molecular and particulate filter that integrates Ebrafil[®] patented media (Sodium permanganate and activated carbon) into a particulate filter
 - Outdoor air cleaning for PM₁₀, PM_{2.5}, ozone, odors, and other pollutant gases
 - Can be tested to determine remaining service life
- The integrated sodium permanganate and activated carbon media add molecular filtration while providing the same level of particulate control

Magnified Filter Media Cross Section



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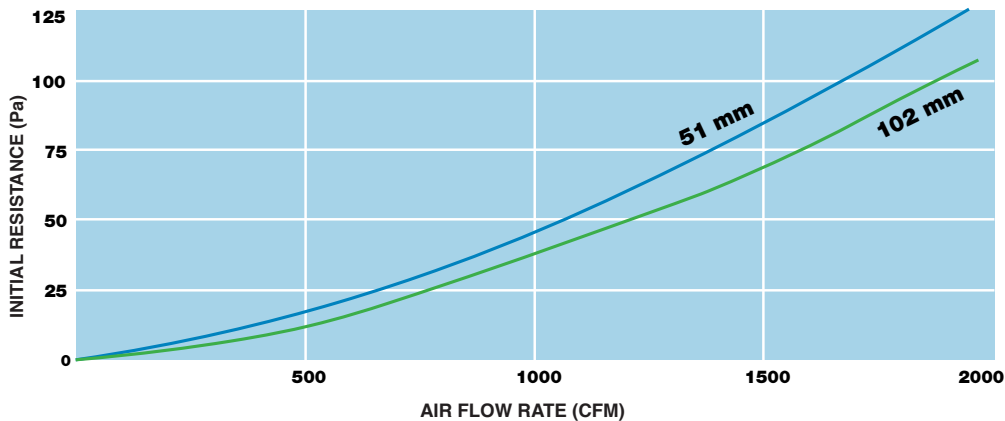
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Advanced Odor Control

PRODUCT DATA

PART NUMBER	NOMINAL SIZE* (H" x W" x D")	Initial Resistance @ 300 fpm	Initial Resistance @ 500 fpm	Final Recommended Resistance	Filters/Case
10202AOC	254x508x51	60 Pa	127 Pa	250 Pa	12
12242AOC	305x508x51	60 Pa	127 Pa	250 Pa	12
14202AOC	356x508x51	60 Pa	127 Pa	250 Pa	12
14252AOC	356x635x51	60 Pa	127 Pa	250 Pa	12
15202AOC	381x548x51	60 Pa	127 Pa	250 Pa	12
16202AOC	406x508x51	60 Pa	127 Pa	250 Pa	12
16242AOC	406x610x51	60 Pa	127 Pa	250 Pa	12
16252AOC	406x635x51	60 Pa	127 Pa	250 Pa	12
18242AOC	457x610x51	60 Pa	127 Pa	250 Pa	12
20202AOC	508x508x51	60 Pa	127 Pa	250 Pa	12
20242AOC	508x610x51	60 Pa	127 Pa	250 Pa	12
20252AOC	508x645x51	60 Pa	127 Pa	250 Pa	12
24242AOC	610x610x51	60 Pa	127 Pa	250 Pa	12
12244AOC	305x610x102	50 Pa	107 Pa	250 Pa	6
16204AOC	406x635x102	50 Pa	107 Pa	250 Pa	6
16254AOC	457x610x102	50 Pa	107 Pa	250 Pa	6
18244AOC	508x500x102	50 Pa	107 Pa	250 Pa	6
20204AOC	508x508x102	50 Pa	107 Pa	250 Pa	6
20244AOC	508x610x102	50 Pa	107 Pa	250 Pa	6
20254AOC	508x635x102	50 Pa	107 Pa	250 Pa	6
24244AOC	508x610x102	50 Pa	107 Pa	250 Pa	6

INITIAL RESISTANCE (610 X 610 mm)



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PRODUCT OVERVIEW

EBRAGRID

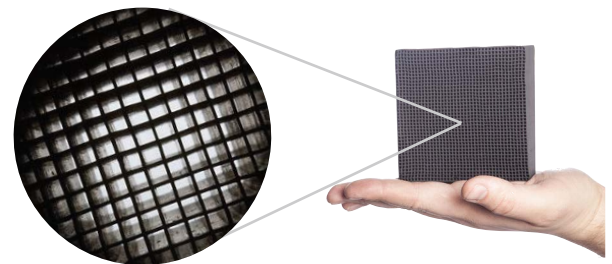
Product Overview:

- Revolutionary filter designed to supply a large amount of chemical filtration with minimal pressure drop
- GridBLOK is an extruded carbon block with parallel cells or channels
- Pressure drops across the GridBLOK is extremely low
- No bypass
- Low pressure drop
- Full utilization of the media
- Self supporting
- Recycled frame with 75% recycled post-consumer content
- Great for recycled air applications
- Ideal for use in:
 - Large Office Buildings
 - Airports
 - Schools
 - Hotels



Why EbraGRID?

- This delivery system offers increased performance in a wide range of applications
- Commercial options:
 - EbraGRID IAQ
 - EbraGRID AM
- Available GridBLOK formulations:
 - Ebrako® GridBLOK
 - Ebracarb® GridBLOK
 - Chlorosorb® GridBLOK
 - Ebracarb® AM GridBLOK
 - IAQ GridBLOK
- Effective against a number of gaseous contaminants
- Can be combined to provide the best performance in an array of applications
- GridBLOK's monolithic structure-based system performance is comparable to traditional packed-bed media systems



Magnified view of the GridBLOK structure

GridBLOK Media

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PRODUCT SPECIFICATIONS

EBRAGRID

EBRAGRID®FILTERS (IP UNITS)

Filter Type	Filter Size, in.			Exact Size, in.			GridBLOK Density lb/ft ³	Media Amount per Filter		Frame Material	Airflow		Pressure Drop i.w.g.
	w	h	d	w	h	d		in ³	lb		fpm	cfm	
EbraGRID 2"	24	24	2	23	23	1 ⁵ / ₈	27.54	533	8.5	Galvanized	500	2000	0.29
EbraGRID 2"	20	25	2	19½	24½	1 ⁵ / ₈	27.54	444	7.1	Galvanized	500	1736	0.29
EbraGRID 2"	20	20	2	19½	19½	1 ⁵ / ₈	27.54	370	5.9	Galvanized	500	1389	0.29
EbraGRID 2"	16	20	2	15½	19½	1 ⁵ / ₈	27.54	296	4.7	Galvanized	500	1111	0.29
EbraGRID 2"	12	24	2	11	23	1 ⁵ / ₈	27.54	266	4.2	Galvanized	500	1000	0.29
EbraGRID 4"	24	24	4	23	23	3½	27.54	1353	21.6	Galvanized	500	2000	0.58
EbraGRID 4"	20	25	4	19½	24½	3½	27.54	1127	18.0	Galvanized	500	1736	0.58
EbraGRID 4"	20	20	4	19½	19½	3½	27.54	940	15.0	Galvanized	500	1389	0.58
EbraGRID 4"	16	20	4	15½	19½	3½	27.54	752	12.0	Galvanized	500	1111	0.58
EbraGRID 4"	12	24	4	11	23	3½	27.54	676	10.8	Galvanized	500	1000	0.58

EBRAGRID®FILTERS (METRIC UNITS)

Filter Type	Filter Size, mm.			Exact Size, mm.			GridBLOK Density g/cc	Media Amount per Filter		Frame Material	Airflow		Pressure Drop Pa
	w	h	d	w	h	d		cm ³	kg		m/s	m ³ /h	
EbraGRID 2"	610	610	51	594	594	41	0.4411	8730	3.9	Galvanized	2.5	3398	73
EbraGRID 2"	508	635	51	495	622	41	0.4411	7275	3.2	Galvanized	2.5	2950	73
EbraGRID 2"	508	508	51	495	495	41	0.4411	6063	2.7	Galvanized	2.5	2360	73
EbraGRID 2"	406	508	51	394	495	41	0.4411	4850	2.1	Galvanized	2.5	1888	73
EbraGRID 2"	305	610	51	289	594	41	0.4411	4365	1.9	Galvanized	2.5	1699	73
EbraGRID 4"	610	610	102	594	594	90	0.4411	22170	9.8	Galvanized	2.5	3398	146
EbraGRID 4"	508	635	102	495	622	90	0.4411	18475	8.2	Galvanized	2.5	2950	146
EbraGRID 4"	508	508	102	495	495	90	0.4411	15396	6.8	Galvanized	2.5	2360	146
EbraGRID 4"	406	508	102	394	495	90	0.4411	12317	5.4	Galvanized	2.5	1888	146
EbraGRID 4"	305	610	102	289	594	90	0.4411	11085	4.9	Galvanized	2.5	1699	146

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PRODUCT OVERVIEW

EBRAFIL KITCHEN ODOR & SMOKE BLEND

Ebrafil Custom Media Blends

Are you ready for a custom solution that eliminates the gases that activated carbon leaves behind? A one-size-fits-all solution won't cut it, which is why Ebrafil specially engineered custom blends to address the unique problems you face while permanently removing gases—even the ones carbon can't remove—from the air. This is done through chemisorption, which chemically transforms gases into harmless solids that remain trapped inside the media.



Kitchen Odor & Smoke Blend

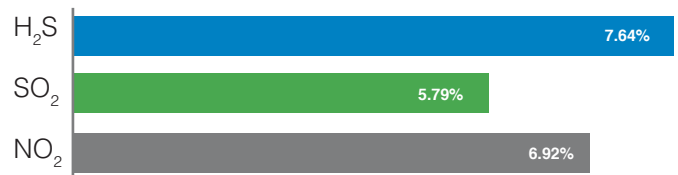
Our Kitchen Odor & Smoke media blend specifically targets common kitchen odors—such as burnt food and cheese—and smoke. This allows for a more effective removal of the gases and contaminants causing the unpleasant smells.

- Ideal for use in:
 - Commercial Buildings
 - Hospitals & Healthcare Facilities
 - Hotels & Casinos
 - Airports
 - Educational Institutions
- Available in:
 - Ebrafilter High Efficiency (HE), V-Bank, Canisters, Modules, Boxes, Sling Bags
- Target Gases: H₂S, SO₂, NO₂, Cl, VOCs

APPLICATION GUIDELINES

Temperature	-4°F to 125°F (-20°C to 51°C)
Humidity	10 - 95% RH
Air Speed	60 - 500 fpm (0.30 - 2.54 m/s)
Performance	99.5% (min) initial removal efficiency in Purafil systems
Bulk Density	38 lb/ft ³ (0.6 g/cc) ±5%

Removal Capacity by Weight



Engineering Specifications

1.0 Media Performance

- 1.1 Shall be the proprietary Ebrafil® engineered media blend designed for Kitchen Odor & Smoke removal
- 1.2 Engineered media shall use chemisorption process to chemically transform contaminant gases into inert solids trapped inside the media, removing gases permanently from the air, unlike activated carbon
- 1.3 Engineered media shall be rated to withstand a continuous operating temperature of up to 125°F
- 1.4 Engineered media shall come in a factory-sealed device from Filtration Group
- 1.5 Media Life Analysis (MLA) shall be conducted to determine remaining usable life

PRECISE TECH COMPANY LIMITED

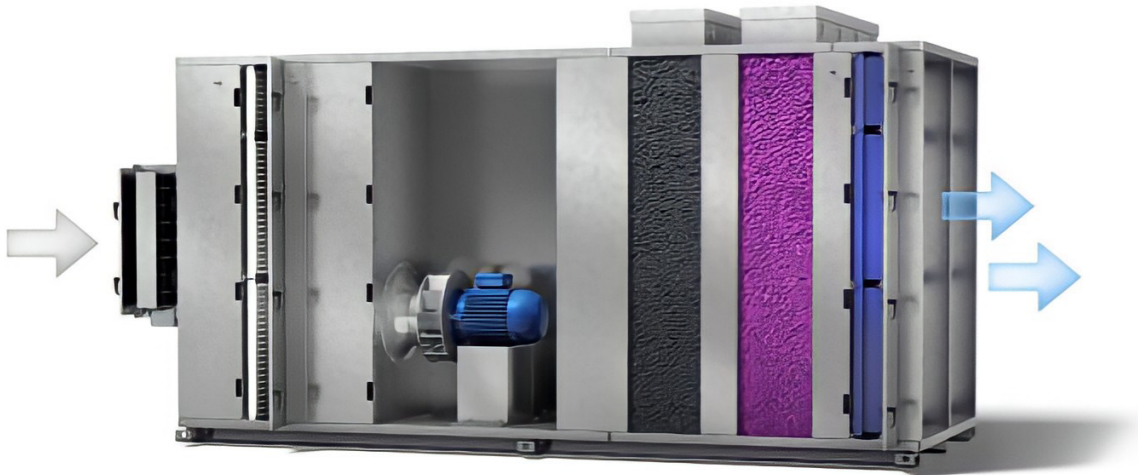
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PRODUCT BULLETIN

DEEP BED SCRUBBER FOR ODOR



The Ebrafil Deep Bed Scrubber (DBS) For Odor

removes high concentrations of odorous gases from screening rooms, small headworks, and large pump stations. It is also used to polish biofilter discharge air. The DBS is built-to-order and sized for airflows from 1,000 to 8,000 cfm. At the heart of the DBS is Ebrafil's dry-scrubbing media. The scrubber is designed for horizontal airflow and houses up to four vertical media stages for multiple gas challenges.

Provides Odor-Free Air: The Deep Bed Scrubber contains up to four, 12-inch deep, vertical media beds. This multi-bed design ensures extended contact time with odorous contaminants and the highest removal efficiency.

Low Maintenance: Each of the scrubber's vertical media beds can be replaced independently on an as-needed basis. This reduces maintenance time and saves in long-term media costs. Media change out is simple and fast. The blower section and media bed are designed to be easily accessible.

Complete Gas Removal: Ebrafil systems are designed for 100% efficiency at any airflow. Ebrafil offers a variety of dry-scrubbing media, each of which targets a specific gas or gaseous contaminant group. Complete gas removal is achieved by combining two or more media in successive stages.

Local Service: Ebrafil's network of local representatives offers convenient and timely service. These factory-trained representatives work in conjunction with Ebrafil's in-house laboratory to provide Media Life Analysis and other comprehensive technical service

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PRODUCT BULLETIN

DEEP BED SCRUBBER

Targeted Odors/Gases:

- Hydrogen sulfide
- Sulfur dioxide
- Mercaptans
- Aldehydes
- Organic compounds

Standard Features:

- 3003 H14 aluminum construction
- Stainless steel hatches and hinges
- Mist eliminator/prefilter
- Up to four, 12-inch-deep (308 mm), vertical media beds
- Internally mounted, enclosed blower system
- Filter and blower side access doors
- Top access media fill chutes
- Side access media ports

Optional Features:

- Double Wall construction
- Air measuring station, CFM gage, room pressure gage and housing (shipping separately for field installation)
- Maintains superior performance in climates with fluctuating temperature and relative humidity
- Lower operating horsepower and pressure drop than activated carbon-only systems

Applications:

- Small Headworks
- Large Pump Stations
- Screening Rooms
- Biofilter discharge