

General

Flanders Superflow-VC Disposable Activated Carbon Adsorbers are designed for gaseous contamination control in both new and existing HVAC systems. Superflow-VC Adsorbers have total-detention capability with all air passing through the carbon beds. These adsorbers can help mitigate Indoor Air Quality problems in buildings where the air must be cleansed of gaseous contaminants. They are also useful in a variety of other applications such as the protection of light industrial processes and works of art.

Construction

Superflow-VC Adsorbers consist of eight activated carbon-filled panels arranged in a V configuration and sealed with non-volatile adhesive into top and bottom injection molded ABS plastic end plates. The sealant completely eliminates bypass within the cell. The end plates incorporate a single header to position the cell in holding frames or side access housings.

Extruded aluminum vertical struts close off the panel edges in front and are aerodynamically designed to minimize airflow restriction and turbulence. Vertical steel rods on the downstream side provide rigidity and minimize twisting and racking.

The activated carbon panels are constructed of one" (25 mm) thick moisture-resistant corrugated kraft honeycomb grids. The honeycomb is filled with granular activated carbon held in place by fine

mesh nylon screens glued to the grid. The screens act as a secondary prefilter and also as an afterfilter. The activated carbon media is premium HVAC grade virgin coconut shell granules with a minimum carbon tetrachloride (CTC) activity of 60% per ASTM D-3467. Granules are 4 x 8 US mesh size with a minimum apparent density of 0.49 g/mL. The minimum hardness is 97 per ASTM D-3802 and the minimum surface area is 1100 m²/g by the N2 BET test method.

Physical Data

Top and bottom end plates: High strength ABS plastic

Vertical struts: Aerodynamically-designed extruded aluminum

Vertical supports: Steel rods on downstream side

Carbon panels: Eight one inch (25 mm) moisture resistant corrugated kraft honeycomb grids filled with granular activated carbon media contained by fine mesh nylon screens on both air entering and leaving sides

Panel sealant: Non-volatile type applied along the entire periphery of the panel to eliminate air bypass

Activated carbon media: Virgin coconut shell base, 4 x 8 US mesh size, minimum 60% CTC activity

Operating limits: 150°F (65°C) and 95% RH, non-condensing

Features and Benefits

- Total detention multi-panel design combines high adsorption efficiency with low pressure drop
- Entire cell is disposable so installation is clean, quick and easy
- Installation flexibility: adsorbers are suitable for both initial and retrofit applications and in front or side access arrangements.
- Gaseous contamination control can be applied to most HVAC air systems
- Impregnated carbons are available for control of difficult contaminants: H₂S, acid gases, formaldehyde, ammonia, aldehydes and amines



Adsorber Protection

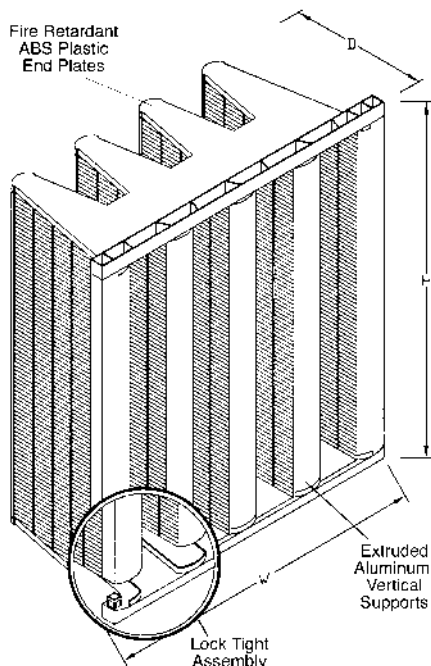
Particulate contamination must be considered when utilizing gas/vapor phase adsorbers. As a minimum, a Flanders prefilter with an efficiency of 25-30% per ASHRAE Std. 52.1 should be installed on the upstream side of the Superflow-VC adsorber in order to extend the service life by significantly reducing dirt build-up. Even higher efficiency prefiltration should be considered when system design allows for additional space and static pressure.

Packaging

Each Superflow-VC Adsorber is individually sealed in a polyethylene bag prior to placement in a heavy duty shipping carton. The bag protects the adsorber from being expended prematurely and also facilitates clean and easy jobsite changeouts. The spent adsorber can be placed in the plastic bag and then in the carton for disposal.

Disposal

Routine disposal is usually permitted if spent adsorbers with Superflow-VC 201 media have been used for normal IAQ applications. Spent adsorbers filled with impregnated carbon and those used in industrial applications may need special handling. Local environmental authorities should be consulted prior to disposal.



Options:

- Superflow VC "Light" with 75% fill.
- Box style full metal wrap
- Double header
- Downstream dusting sack

Application Considerations

Superflow-VC Adsorbers in HVAC airstreams can remove many gaseous contaminants thus mitigating their effects on people and processes. They are especially useful in controlling common contaminants that cause poor indoor air quality (IAQ) in commercial and industrial buildings such as office buildings and hospitals. Typical applications and controlled contaminants are:

<i>Airports</i>	<i>SOx and NOx</i>
<i>Blueprint facilities</i>	<i>Ammonia</i>
<i>Food processing</i>	<i>Amines</i>
<i>Loading docks</i>	<i>Diesel fumes</i>
<i>Museums</i>	<i>Aldehydes and acid gases</i>
<i>Office buildings</i>	<i>VOCs and aldehydes</i>
<i>Research facilities</i>	<i>Animal odors</i>

Light duty IAQ applications can usually be handled by Superflow-VC units selected at 500 fpm (2.54 m/s) face velocity with a 0.030 second residence time. Medium and heavy duty applications include airports, engine exhaust, some industrial processes and situations requiring impregnated carbon. For these applications, adsorbers should be selected at greatly reduced face velocities for a longer residence time.

Residence Time

Residence time is the period, usually a fraction of a second, that the contaminant molecule is within the boundaries of the media bed depth and is exposed to adsorption capture and (for chemisorption) chemical change. The efficiency of an adsorber is a function of the bed residence time for a given contaminant and set of environmental conditions. The longer the residence time, the greater the efficiency. Residence time is computed as: (bed area exposed to airflow x bed depth) / airflow rate.

Installation

Superflow-VC Adsorbers are not position sensitive. Airflow may be through the header side face or the opposite side face. The cell may be turned so that the panels are vertical or horizontal. Wherever possible, adsorbers should be installed with panels vertical and air entering the header side face.

Superflow-VC Performance Data

Adsorber Model Number (See Note 1)	Nominal Size H x W x D inch (See Note 2)	ADSORBER FACE VELOCITY, fpm												Cell Weight lb
		125			250			375			500			
		cfm	PD	Res	cfm	PD	Res	cfm	PD	Res	cfm	PD	Res	
SFVC-242412	24 x 24 x 12	500	0.10	0.11	1000	0.20	0.050	1500	0.33	0.040	2000	0.50	0.030	34
SFVC-122412	12 x 24 x 12	250	0.10	0.11	500	0.20	0.050	750	0.33	0.040	1000	0.50	0.030	17
Adsorber Model Number (See Note 1)	Nominal Size H x W x D mm. (See Note 2)	ADSORBER FACE VELOCITY, m/s												Cell Weight kg
		0.64			1.27			1.90			2.54			
		m ³ /s	PD	Res	m ³ /s	PD	Res	m ³ /s	PD	Res	m ³ /s	PD	Res	
SFVC-242412	610x610x305	0.24	0.02	0.11	0.47	0.05	0.050	0.71	0.08	0.040	0.94	0.12	0.033	15.5
SFVC-122412	305x610x305	0.12	0.02	0.11	0.24	0.05	0.050	0.35	0.08	0.040	0.47	0.12	0.033	7.7

Notes:

- *Insert Superflow-VC carbon type model number.
- Actual size of adsorber header is 0.625" (16 mm) under on face height and width; actual adsorber depth is 11.5" (290 mm).
- "PD" represents clean pressure drop in inch w.g. or kPa. Values shown may be averages or estimates typical of product styles. Contact factory for test data on specific models.
- "Res" represents residence time in seconds.

Superflow-VC Carbon Weight Per Cell

Adsorber Size Designator	Superflow-VC Carbon Type									
	201		202		204		205		209	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
242412	25	11.4	29	13.1	28	12.6	29	13.1	33	14.9
122412	13	5.9	14	6.3	14	6.3	14	6.3	16	7.2

Frames and housings used for 12" (305 mm) deep particulate filters are well-suited for Superflow-VC adsorbers. In new construction, built up banks of Flanders Type 9 Holding Frames and Clips or Flanders K-Trac Framing Modules holding prefilters and adsorbers are often chosen where 30 inches (760 mm) of upstream service access space is available. Flanders Sureseal Side Access Housings are most often used for small systems and for systems where in-line service access space is limited.

Type 9 Holding Frames include gaskets on the flange against which the adsorber header seals. For side access housing applications, gaskets are applied to the side of the adsorber header to achieve an adsorber-to-adsorber and adsorber-to-door seals.

Carbon Type and Typical Applications

(Weights are per 24 x 24 adsorber)

TS 201- Virgin coconut shell- VOC (volatile organic compounds) Carbon weight = 25 lb/11.4 kg

TS 202- Impregnated for control of acid and malodorous gas absorption Carbon weight = 29 lb/13.1 kg

TS 204- Impregnated for control of ammonia and light organic amines adsorption Carbon weight = 28 lb/12.6 kg

TS 205- Impregnated for control of aldehydes Carbon weight = 29 lb/13.1 kg

TS 209- Impregnated for universal adsorption of both acid and alkaline gases and vapors Carbon weight= 32 lb/14.9 kg

Refer to Superflow-VC Drawing for construction details.

Model Number Development

SFVC	TS201	242412
Superflow VC	Carbon Type	Nominal Size

SFVC-TS201-242412

Represents a Superflow VC Carbon Adsorber with Type 201 carbon, nominal 24" x 24" x 12" (610 mm x 610 mm x 305 mm) with polyfoam gasket material shipped loose.

Guide Specifications

1.0 Products

- 1.1 Activated carbon adsorbers shall be total-detention type Superflow-VC models as manufactured by Flanders.
- 1.2 Model numbers and capacities of the adsorbers, particulate prefilters and holding frames or housings shall be as specified or as shown on the drawings.

2.0 Construction

- 2.1 Adsorbers shall be constructed of multiple carbon-filled panels arranged in a V configuration. Panels shall be 1" (25 mm) thick moisture-resistant corrugated kraft honeycomb sealed to top and bottom end plates with non-volatile adhesive.
- 2.2 Panels shall be completely filled with 4 x 8 US mesh size activated carbon held in place by nylon screens.
- 2.3 Top and bottom end plates shall be injection-molded high strength ABS plastic with integral headers.

- 2.4 The cell shall be assembled with aerodynamically designed vertical front struts and vertical steel rod supports on the downstream side.
- 2.5 Each adsorber shall be sealed in a polyethylene bag before being placed in its shipping carton.

3.0 Performance

- 3.1 Activated carbon media shall be virgin coconut shell base, minimum 60% CTC activity by the ASTM D-3467 test method, minimum apparent density of 0.49 g/mL, minimum hardness of 97 by the ASTM D-3802 method and a minimum surface area of 1100m²/g by the N₂ BET method.
- 3.2 The SFVC201-242412 model shall contain no less than 25 lb (11.4 kg) of activated carbon. At 2000 cfm (0.94 m³/s) it shall have an airway resistance no greater than 0.50 inch w.g. (0.12 kPa) and a residence time no less than 0.030 seconds.

Flanders Precisionaire

Foremost in Air Filtration

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