Design and Specification

For

Extraction Ventilation System

Proposed property:

135 Doncaster Road
Barnsley
S70 1UF

Date:

22nd February 2018



Unit 28 Coleshill Industrial Estate, Station Road, Coleshill, West Midlands B46 1JP
Tel: 01675 430490 Fax: 01675 464050 Email: enquiries@springfieldcatering.co.uk
Company Registration Number 4973359 VAT Number 841390535

Proposed system specification:

High level Discharge With Carbon Filtration

Due to the nature with a Rear wall to except a vertical riser extracting up over the roof, we propose to install all the plant internally in store room area on anti-vibration mountings and discharge through a high velocity cowl one metre above the eaves.

Odour control system to be implemented to reduce any odour emanating from the premises with first stage mesh filtration after the canopy baffle filters, then a carbon impregnated bag filter to filter out any carry over from the mesh filters then a final stage of a activated carbon filter.

This proposed specification with its anti-vibration hangers will reduce any reverberation type vibration from the extraction, travelling through the building.

Extraction Ventilation System

Specification

We can confirm that the design and specification for the extraction system at the above address is in accordance to DW172 specification.

Canopy

The 3500mm (long) x 1200 mm (wide) 430 grade, brushed stainless steel wall canopy, complete with stainless steel baffle filters.

Incorporated within each canopy would be a full length plenum built filter housing to accommodate 5off, 500mm (wide) x 500mm (high) x 50mm (deep) grease filters.

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Canopy details

Length Metre		Width Metre	Type	Grade Satin	Number of filters	Filter size	Filter Type	Canopy Style
A	3.50	1.20	Wall	430	5	500x500	Baffle	Sloping

Canopy volume using MUB fan

Length		Width		M²		Velocity		Volume m3/sec
3.50	X	1.20	=	4.20	X	0.44 (85ft/min)	=	1.85 m3/sec

Baffle filters in the canopy



It is universally recognised that there is an increasing need to maintain & improve hygiene standards & reduce fire hazards within kitchens. The Baffle Grease filter accomplishes both needs through its clever design of interlocking baffles that provide a tortuous route for the passage of air through the filter by creating two rapid 180º air direction changes simultaneously. The grease molecules having a far greater inertial force than air impact themselves on the vanes.

A series of vertical Stainless Steel vanes are housed in a channel frame, with each of the baffles strategically aligned to provide the highest potential for grease removal.

Due to the smooth nature of the vanes the grease naturally runs downwards, through the drainage holes and into the collecting trays normally provided within the canopy holding casings.

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Extraction system details

The MUB fan mounted after the twin activated carbon filter will have an additional attenuator after it to further reduce to noise breakout.

450mm long silencer type acoustic cowl will reduce the breakout noise by a further 20 decibels and with a horizontal discharge @ 10.27 m/sec.

Extract Fan Details

Located Internally 4 pole, single-phase centrifugal fan which works against the increased resistance of Activated Carbon filter unit.

This fan operates with a breakout noise level of 60dba at three metres distance.

The sum of this noise attenuation takes the breakout noise level to 40dB at three metres distance from discharge.

Velocity equals volume divided by the area

Volume m^3/sec	Divide by	m^2	=	Velocity M/sec
1.85	-	0.18		10.27

Grease filter resistance

Baffle filters	Quantity	System Volume	Equals each	Resistance in Pascal's
500x500	5	1.85 m3/sec	0.37 m3/sec	40 pa

System resistance calculations

Qty	Extraction system	Pascals
1	High velocity cowl with bird guard	30
1	Twin Activated Carbon Filter unit	140
1	Twin mesh pre-filter & twin bag filter	80
5	Baffle grease filters as above	40
Total static resistance on the system		290

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Selected Fan Details

Fan Model	Type	volume m3/sec	Resistance	Speed rpm	Phase	Noise level @ 3 metres
MUB 500E4	Backward curved	2.15	290 Pascal's	1332	1	62 db
450mm long 600mm square splitter attenuator will reduce noise level by						- 20 db
Total noise level at 3 metres from discharge wall cowl						**42 dba**

MUB 042 500E4-A2 Multi-fan

Voltage	Frequency	Watts	Current	Starting Current	Max temp	Class	Enc	Spl @ 3mtrs	KG
240 V	**50Hz**	**1332**	**5.78 A**	**23.00 A**	**40 C**	**F**	**55**	**62 db(A)**	**57**

MUB 042 500E4-A2 Multifan description details



- Speed-controllable
- Modular system
- Integral thermal contacts
- Low sound level
- Flexible airflow direction due to removable panels
- Installation in any mounting position
- Maintenance-free and reliable
-

The MUB fans size 500E4 have an impeller with backward curved blades, manufactured from aluminium.

The MUB 500E4 is equipped with external rotor motors fully speed controllable. Motor protection is done by thermal contacts, which have to be connected to an external motor protection device. The casing consists of a corrosion-resistant aluminium frame with fibreglass reinforced plastic corners of PA6; highly shock-resistant.

The double skin panels are manufactured from galvanised steel with 20 mm mineral wool insulation. To avoid condensation the profile is provided with a separate chamber to fix screws.

The Multi-box fans are delivered for straight through airflow but can easily be rebuilt due to removable panels. This allows flexible ventilation solutions. The MUB can also be used as extract- or supply air unit in air handling units. Installation in any mounting position is possible.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	-	77	82	77	74	71	68	61	85	59
Outlet*	-	79	81	78	80	73	69	62	86	62
Breakout*	-	77	73	62	58	48	42	36	79	47

* Lw dB re 10^{-12} W ** dBA re $2x10^{-5}$ Pa

Sound data at requested duty.

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Odour control method

To meet DEFRA's requirements.

The filtered air-stream will be free from grease and cooking particulates.

The unit will neutralise 95% of the odour before discharging to atmosphere.



The carbon filter is the ideal solution for a modular approach to fume removal. Activated carbon dates back many years. In the First World War, gas masks were filled with activated carbon to remove chlorine gas.

Today a wide range of carbon filters to deal with many noxious fumes and gases, whilst maintaining high levels of strength and low-pressure loss.

Manufactured from a number of carbon biscuits held in a vee formation within a corrosion-proof metal casing, these are sealed into the frames of our filters using polymer, which eliminates the possibility of any air bypass around the carbon.

Type 8 carbon filter features: High quality carbon – all grades available

Robust modular construction

Low-pressure losses

High carbon content

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Odour control method

2 stage filtration unit

Stage		width	Height	Thickness
1st stage	Twin mesh filters side by side	600	600	50
2nd Stage	Twin activated carbon	600	600	450

Area m2	Multiply	Length	Divided	Volume m3/sec	Equals	seconds dwell time
0.72	x	0.90	÷	1.85	=	0.35
Mesh pre-filters fitted to take out any large particulates						0.04
Total dwell time achieved						0.39



300mm overhang front and sides past any equipment

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Air replacement

It is advisable to install an air supply system either built into the front of the canopy with the fan and ducting mounted in the wall or through ceiling diffusers. Axial fan complete with silencer and speed controller, supplying fresh ambient air through grilles mounted in the canopies front face.

Supplying fresh ambient air to replace 70%-80%volume of the extracted air.This will improve the extraction and give a better working environment for your staff.

If gas appliance a gas interlock system must be installed to sense when the extraction is running to turn on the gas and turn off gas if fan fails or stop button emergency.

Statement

In support of a planning application for a A3 hot food premises use for the ground floor Shop unit located within an well established shopping parade of terraced shops.

This is to provide additional and supported information relating to the proposed kitchen extraction system.

Type of premises

This business will be preparing hot food, Pizzas and associated dishes. The methods of cooking would be stove cooking, frying and pizza oven etc.

Number of covers per night 30-40

Type of premises

Pizza & Kebab due to information at the time, subject to chefs menu change at the time, but based on size of premises and limitations.

The take away business would operate between the hours of 4.00pm to 11.00 pm evenings, 6-7 days a week approximate hours to be confirmed.

The canopy extraction would not operate outside agreed opening hours.

Due to the potential cooking odours and aromas associated with cooking, it is a requirement that the fumes are extracted and treated before discharging to atmosphere outside at side wall facing the rear of the premises with minimal risk of any nuisance to surrounding premises or neighbours.

Premises of this size and usage require the time gases remain in the carbon filtration filter box is to be between 0.3 and 0.50 seconds High filtration.

Comments:

This canopy extraction system should work on a face velocity of 0.40 to 0.51 Metres per second. 300mm overhang is on all three sides of the wall canopy over any cooking appliance, based on gas fuel type cooking.

Defra: risk Assessment For Odour

Impact Risk	Odour Control Requirement	Significance Score
Low to Medium	**Low level odour control**	Less than 20
High	**High level odour control**	20 to 35
Very High	**Very high level odour control**	more than 35

Dispersion		
Very poor	**20**	**Low-level discharge, discharging to courtyard or restriction on stack**
Poor	**15**	**Not low-level but below eaves, or discharge of below 10 M/S**
Moderate	**10**	**Discharging 1m above eaves 10 to 15 M/S**
Good	**5**	**Discharging 1M above ridge 15 M/S**
Proximity of receptors		
Close	**10**	**Close sensitive receptor less than 20metres kitchen discharge**
Medium	**5**	**Close sensitive receptor between 20 to 100 metres from kitchen discharge**
Far	**1**	**Close sensitive receptor more than 100metres from kitchen discharge**
Size of kitchen		
Large	**5**	**More than 100 covers a large size takeaway**
Medium	**3**	**Between 30 and 100 covers or medium sized takeaway**
Small	**1**	**Less than 30 covers or small takeaway**
Cooking type (odour and grease loading)		
Very high	**10**	**Pub (high level of fried food), fried chicken, burgers or fish and chips**
High	**7**	**Kebab, Vietnamese, Thai or Indian**
Medium	**4**	**Cantonese, Japanese or Chinese**
Low	**1**	**Most pubs, Italian, French, pizza or steakhouse**
Total	**25**	
Classification	**High**	**High Level Odour Control Required**

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General guidelines to cleaning and maintaining an extraction system

The fans and ducting have been situated to maximise the full extraction potential.
It is important that the following procedures are carried out as stipulated.
The canopy must be externally cleaned on a weekly basis.
All grease filters must be cleaned at Least three times a week using hot soapy water, to avoid grease carry over.

Cleaning and maintenance of extraction system:

The canopy and full extraction system must be professionally deep cleaned no later than twelve months after installation and certified. Failure to adhere to these guidelines will prevent the system working to its full potential, and odours may arise due to grease residue inside the ducting giving a carry over.

Summary Cleaning Information

Canopy
Wash down weekly with hot soapy water ensure all fat channels are clear and clean.

Grease Filters
Clean at least three times a week using hot soapy water, water must be hot enough that rubber gloves are worn.

Ensure oil and fat outlets are clear and clean.

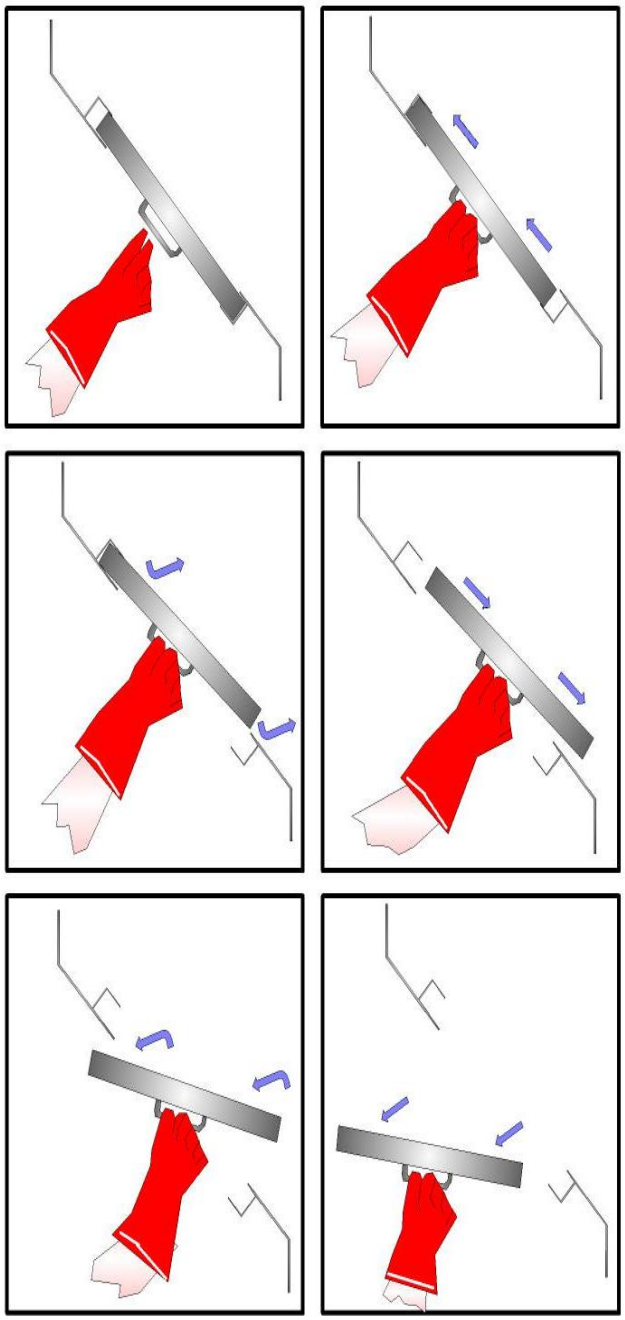
Replace filters with the drainage slots at the bottom facing down.

Carbon Filters
Inspect for signs off grease build up monthly. Change- manufactures Recommendation every eight - twelve months depending on hours used and type of deposits left on the filters.

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Use appropriate gloves and apron when cleaning when using hot water.

Removal of grease filters and grease pots for cleaning





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PROPOSED SITE PLAN

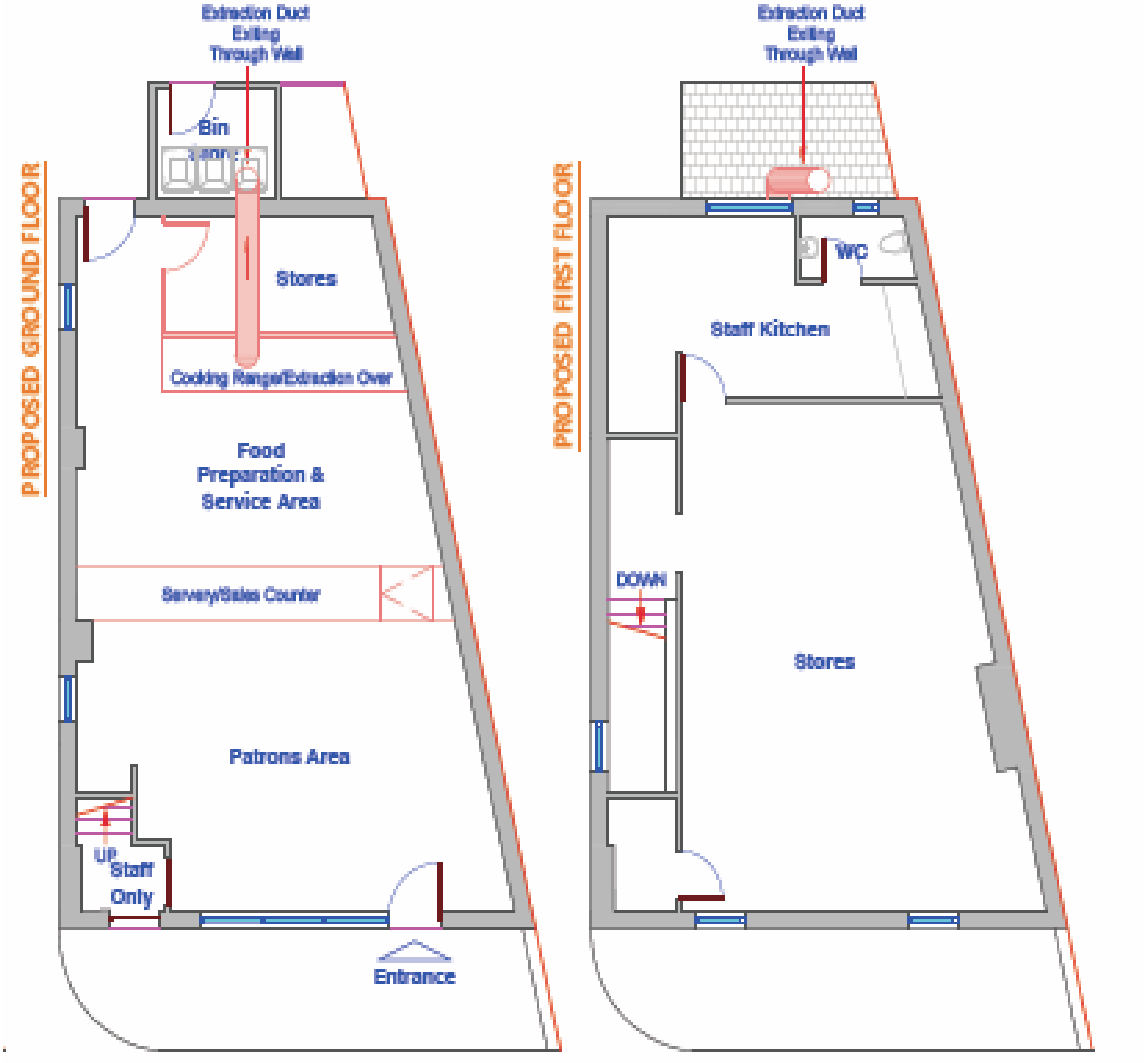


EXISTING SITE PLAN



Drawing No: 003898	Drawing Title: Existing & Proposed Site Plans	Property: 135 Doncaster Rd, Barnsley, S70 1UF	Date: 29/01/2018	Sheet: 2 of 3
UK Surveyors Ltd CAD Drafting - Planning - Building Regulations - Building Surveying - Alcohol Licensing		☎: Freephone: 0808 168 9059 ☎: Head Office: 01889 220 880 ✉: enquiries@uksurveyors.net 🖳: www.uksurveyors.net	Drawn By: DJR & BT	Scale: 1:500 @ A2

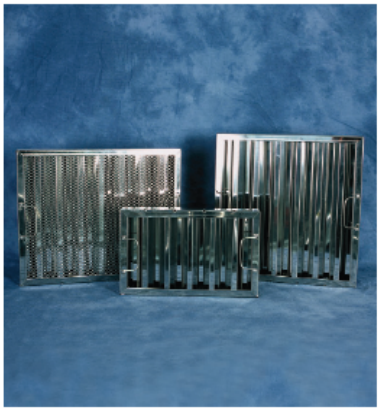
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LONGAR INDUSTRIES LIMITED



AIRGARD™ FEATURES

- Rolled stainless steel section with safety edge on frame and blades.
- Welded construction.
- Folding handles.
- Drain holes.
- Optional mesh to front and rear.

TYPE 2 COMMERCIAL KITCHEN FILTER

For use in commercial kitchens and ventilation to extract grease laden air and act as a fire barrier.
Fire barriers prevent any cooking flames traveling past the extract canopy. The new Type 2 is a development of customers requesting certain attributes for the baffle filter, the main ones being rolled edges on frame and blades.
The Type 2 is available in 20mm or 45mm depths only, this is required for the filter to operate at a constant efficiency and to protect the system as a flame barrier as tested to European Standard DIN 18869-5.
The Type 2 Baffle design has a higher grease filtration efficiency than other baffle filters on the market due to the blade design and spacing.

Pressure drops and test results please see the enclosed chart below.

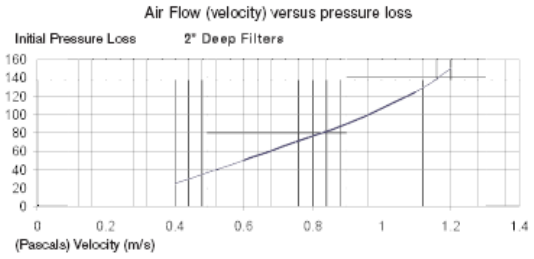
MATERIAL SPECIFICATIONS

As standard, all baffles are Stainless Steel 430 with a polished finish. (Other finishes and material are available)

TECHNICIAL SPECIFICATIONS

Longar specifies the Baffle Filter as height x width x thickness. The handles are fixed to the height and drain holes punched on the width. The length of the baffle is the height, please ensure correct orientation is given when ordering.

H × W × D Actual Size (mm)	
243 × 395 × 45	496 × 395 × 45
243 × 496 × 45	496 × 496 × 45
395 × 395 × 45	597 × 597 × 45
395 × 496 × 45	624 × 395 × 45
444 × 444 × 45	Custom sizes are available



PACKAGING

All filters are packed in secure corrugated cardboard cartons, tape sealed for protection against dust and other contaminates.

Longar Industries Limited
Unit 25, Glenmore Business Park, Colebrook Way, Weyhill Road, Andover SP10 3GZ
Tel: 01264 332993 Fax: 01264 332994 www.longar.co.uk

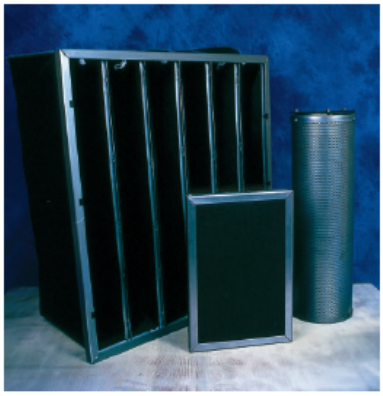
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AIRGARD TYPE 8 THE CARBON FILTER

LONGAR
INDUSTRIES LIMITED



FEATURES

- High quality carbon
- Robust modular construction
- High carbon content
- Special sizes available on request
- Available with handles and seals
- Low pressure losses

ACTIVATED CARBON UNITS (ACU)

For a modular approach to fume removal the ACU is the ideal solution. The ACU unit is manufactured from a number of carbon biscuits held in a vee formation within a corrosion proof metal casing. The carbon biscuits inside the units are 25mm thick and are also sealed into the frames using polymer which eliminates the possibility of any air by-pass around the carbon.

PRE-FILTRATION

Carbon filters are designed to remove fumes and odours and are therefore not able to filter fine particles and dust. If left unprotected, the life of the carbon is severely reduced. To protect the filters use pleated and bag filters to the correct grade; this will depend on the environment.

SIDE ACCESS HOUSINGS

These are housings which encompass the Activated Carbon Unit along with the Pre-Filtration (such as Bag/Panel Filters). All housings have a side panel which is removable so that access can be gained easily to replace the filters.

This type of housing is ideal for adding to existing installations such as catering extracts or industrial ventilation systems.

Options are available depending on the application.

APPLICATIONS

Activated Carbon dates back many years. In the first World War gas masks were filled with activated carbon granules to remove chlorine gas. Today Longar produces a wide range of carbon filters to deal with many noxious fumes and gases, whilst maintaining high levels of strength and low pressure loss.

Major uses of carbon are in areas where toxic or offensive odours need eliminating. For example sewage works, hospitals, slaughterhouses, restaurant kitchens, airports, toilets, wash rooms, laboratories, office blocks and many more.

ACTIVATED CARBON

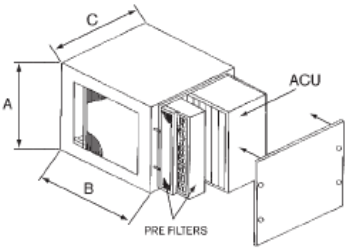
Activated carbon is different from the normal type of loose carbon granule panel in some ways. Firstly, and most importantly, activated carbon granules are fixed and set in position through a thermo-chemical process. With the loose fill granule carbon filters there is a tendency for the granules to rub against each other causing bedding down of the granules and excess dust which would need further filtration.

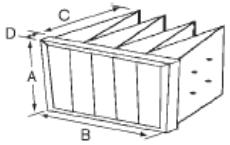
In addition, bedding down will also allow odours and toxic fumes to by-pass the filter.

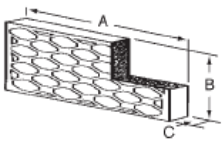
The bonding process in our activated carbon filters joins the carbon granules by the points, leaving the pores free to absorb the unwanted contaminants.

This type of construction produces a strong carbon biscuit, which requires no internal structure to support the filter.

Width	Height	Depth	Panels	Flow and pressure loss @ 0.12 secs contact time		Flow and pressure loss @ 0.24 secs contact time	
mm	mm	mm		M^3/sec	PA	M^3/sec	PA
597	597	147	12	0.230	125	0.115	40
597	597	297	12	0.450	125	0.225	40
597	597	447	12	0.705	125	0.353	40
597	597	597	12	0.940	125	0.470	40
292	597	147	6	0.115	125	0.058	40
292	597	297	6	0.225	125	0.113	40
292	597	447	6	0.353	125	0.176	40
292	597	597	6	0.470	125	0.235	40







CARBON PLEATED PANEL & BAG FILTERS

The Pleated Panels like the Carbon Bag filters are made from non-woven synthetic filter media which is impregnated with activated carbon.

This type of filter is a good solution for less demanding applications, and an inexpensive alternative to the granular carbon filters.

Due to the nature of the product, they can not offer the same life or dwell time associated with ACUs or the Carbon panel filters.

Available in various sizes.

ACTIVATED CARBON PANELS

The carbon biscuits are sealed into steel frames, a scrim is then added to protect the carbon surface from dust contamination. Sealing the carbon blocks in a frame stops any air by-pass, whilst protecting and supporting the carbon block. Please view the price list for stock sizes. Custom sizes are also available.

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