

POWERED VENTILATION LTD.

Kitchen Extract system Solutions

www.poweredventilation.co.uk

SPECIFICATION ON EXTRACTION SYSTEM:

SITE REF:

The Huntington ,
Northmoor Road,
Manchester,
M12 4HP

APPLICATION REF: 129778/FO/2021

DATE:28/05/21

Canopy Hoods Details

Dimensions of hood : 6.5 x 1300 x 400 / 600

The canopy will be manufactured from stainless steel grade 304, with a 400mm front and 600mm back design. The canopy hood will be supplied with 495*495*45 stainless steel baffle filters, with grease drain off taps on each end of the extraction hood.

Face velocity hood	= 8.45m/s
Design volume	= 4.31m ³ /sec

Total number of grease filters 13 / Dimensions 495*495*45

Design Volume 4.31m³/s / 13 = 0.33m³/s

13 off stainless steel baffle filters

Duct Work and Discharge Efflux Velocity for Hood

The duct work will spigot off the top of the 6.5mtr hood, the extract duct will then continue up to the carbon filtration section and plant (i.e. the extraction plant), which will run horizontally against the kitchen ceiling internal of the building before exiting the building to connect onto the external vertical discharge flue which will be 1mtr above the eaves of the building, discharging via High Velocity Discharge Cowl.

The extract hood will have a clearance of 2mtr to the front underside, the will plant section consists of a carbon filtration unit before the extractor fan which will be united to an attenuator with anti-vibration mounts and Dura-dyne connections which will help nullify any further transmitting noise and vibrations, the extractor fan will be speed controlled via auto-transformer regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers, the plant will have accessible points for service and maintenance. The plant system which will all be suspended using M10 Rod hangers and Heavy duty 20*41 uni struct support bars where required before going up to the vertical discharge flue which will only appear external of the building.

The vertical discharge flue will be of a high Velocity Discharge cowl which will be set 1mtr above the eaves of the building, the wall mounted duct support brackets for the vertical riser will be hard fixed and isolated with Anti-Vibration-Mounts (AVM). The High Velocity Cowl is ideal for good dispersion of fumes.

For aesthetic purposes the exposed vertical discharge flue can be painted to suit exterior of building colour to soften image of the gray steel finish of all general ducts (to be approved by Authority please see below two selection of RAL colour codes which can be checked via websites on RAL colours with code given for selection. (brick red / Terracotta Ral code: 3009 / matt black slate Ral code:9005 / Graphite grey Ral code:7024)

The duct work size is approximately 730*730 or equivalent and at the discharge point will be 560 dia

$.73 \times .73 = 0.53\text{m}^2$ (air across duct section)

$4.31\text{m/s} / 0.53 = 8.13\text{m/second}$ (air speed in duct)

The efflux velocity is **17.49m/second** and the duct work will be free from grease disperse all fumes to high level.

($4.31\text{m}^3/\text{s} / 0.2463\text{m}^3$ (free area inside 560 dia duct or equivalent) = **17.49m/s velocity**)

Pressure Lost in System

8 off, Linear Metres duct@	2.5 pa	=	20pa
13 off, Stainless Baffle Filters		=	100pa
1 off, High Efficiency cowl + Bends		=	90pa
1 off, Carbon unit and pre-filter		=	125pa
Total		=	335pa clean / 400 pa dirty

Required duty and pressure: 4.31m³/s @ 400 pa

Extractor Fan Specification

Fan selected: SLC560/2-3 REVOLUTION LONG CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Extract fan will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

This fan runs at 2920rpms with a maximum operating noise of 75dBA and will handle air flow rate in excess of 5.264m³/sec @ 597pa.

KITCHEN FRESH AIR-INLET DETAILS & CALCULATIONS:

Design Volume: $4.31\text{m}^3/\text{s}$ (canopy hood design volume) $\times 3600 = 15,516\text{m}^3/\text{hr}$

Kitchen area $5.4\text{m} \times 7.9\text{m} \times 2.4\text{m} = 102.38\text{m}^3$ recommended air change rate for commercial kitchen is 60 ach

The air change rate equates to $15,516\text{m}^3/\text{hr}$ divided by the room volume 102.38m^3 . This gives us an air change rate of 151.55ach. Minimum for commercial kitchen 30-60 ach, this figure can be brought down using the speed regulator.

Supply Volume Design:

With such a high air change the design would call for the maximum recommended replacement of 85%

This would be $4.31\text{m}^3/\text{s}$ ($15,516\text{m}^3/\text{hr}$) $\times 85\%$ requires $3.66\text{m}^3/\text{s}$ ($13,176\text{m}^3/\text{hr}$)

Pressure Lost in Air- Supply System

Allowing for 45 pa filter / (600×600 duct $= 7.03\text{m/s}$ velocity) 100 pa duct / 80 pa grille / bends 30 / = **255pa clean / 300 pa dirty**

Required duty and pressure: $3.66\text{m}^3/\text{s}$ @ 300 pa

Air-Supply Fan and Grill Specification

Fan selected: SLC500/2-3 REVOLUTION LONG CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Extract fan will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

This fan runs at 2935rpms with a maximum operating noise of 71dBA and will handle air flow rate in excess of $4.244\text{m}^3/\text{sec}$ @ 403pa.

Silencer Details:

PLEASE SEE ACCOUSTIC DETAILS PROVIDED BY ACOUSTIC CONSULTANT

Odour Control Details:

Before the fan will be a purpose built carbon filtration discarb unit and will house a pre-filter (to prolong the life of the activated carbon cells) and hold approximately 149 carbon bonded panel cells.

For 0.3 seconds contact time- Typically recommended for Spicy cuisine such as Thai / Indian / Grill & Steakhouse / Fast-food. (1 single carbon panel @ 594 x 594 x 25mm framed will achieve a 0.3 second contact time at 0.029m3/s)

$$\text{DESIGN AIR FLOW RATE } 4.31\text{m}^3/\text{s} / 0.029\text{m}^3/\text{s} = 148.62$$

Therefore a minimum of 149 Extra Duty carbon cells panels must be used.

By rounding the number of carbon filters up from the calculations, it allows some room for any inefficiency in the odour control.

Cleaning and maintenance

The carbon cells should be inspected for carbon testing every 3 months for results in changing, again this will be done by Installation contractors. This will give us a result in whether the change of the Carbon Filters should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers. We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The carbon filter/pre-filters and system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.



Ref: MDR/J4714a

13th June 2021

Powered Ventilation Ltd

Alexander House

60 Tenby Street North

Birmingham

B1 3EG

Dear Sirs

Re: The Huntington, Northmoor Road, Manchester, M12 4HP - Proposed Kitchen Supply & Extract Ventilation Systems - External Noise Assessment

Further to the receipt of your ventilation system design information, we are pleased to forward our noise assessment for the proposed kitchen supply & extract ventilation systems as follows:-

We visited the site on 7/6/21 to inspect the proposed location for the new kitchen ventilation system and measure the background noise level. The 2 storey detached building is located at least 8m away from the nearest adjacent house and has residential accommodation on the 1st floor level. The extract discharge will be approximately 2m from a residential 1st floor window and the fresh air intake will be approximately 4m away from a 1st floor residential window. The intended operating hours are 11.00hrs to 23.00hrs. At 22.45hrs the background noise at the rear site boundary opposite the rear wall location for the fresh air intake 1.5m above ground level was 43.0dB LA90 30min, a noise level created primarily by road traffic in the locality.

RandTech Consulting 3 Melbourne Lane Northampton NN5 6HS
Tel 01604 451213 Mob 07966 913809 E-mail mdrand1@aol.com www.randtech-consulting.co.uk



Ref: MDR/J4714a

The instrumentation used for the measurements was a Rion NL-52 precision grade real time analysing sound level meter, serial number 00220558. The RTA was calibration checked before and after the measurements and seen to be correct. Please see attached current certification for the instrument.

The design criterion we advise to be applied to the proposed ventilation systems external noise measured at the nearest reception location is at least 10dB below the prevailing background $L_{A90\ 1hr}$ values measured, equating to no more than 33dBA @ 4m from the fresh air intake at the rear of the building and no more than 33dBA @ 2m from the extract discharge at the side of the building. BS4142:2014 assessment methodology compares the background noise level with a plant rating noise level. For this site, the noise-controlled ventilation systems will have no distinct tonal characteristics or intermittency which would require correction to the plant source noise to derive the rating level. Controlling the plant noise source to be at least 10dB below background ensures no adverse addition to the background noise level at the nearest reception locations.

For the proposed kitchen extract ventilation system, the fan discharge silencer advised would be a rectangular splitter silencer, 33% free area, typically 1200mm wide x 800mm high x 1800mm long. The silencer should reduce the radiated discharge noise to approximately 32dBA @ 2m distance.

For the proposed kitchen supply air ventilation system, the fan intake silencer advised would be a rectangular splitter silencer, 33% free area, typically 900mm wide x 900mm high x 1500mm long. The silencer should reduce the radiated intake noise to approximately 32dBA @ 4m distance.

For the intake side of the extract ventilation fan we advise fitting a silencer, typically a circular silencer with pod, typically 560mm i/d x 710mm o/d x 560mm long. For the discharge side of the supply fan we advise fitting typically a circular silencer with pod, typically 500mm i/d x 650mm o/d x 500mm long.



Ref: MDR/J4714a

In addition, the fan and ductwork system should be supported off the building structure using anti-vibration mounts/hangers to avoid vibration transmission into the building structure.

We have attached our noise level design calculation sheets and supporting information for your reference.

We trust the noise assessment meets with your approval and we remain.

Yours faithfully

A handwritten signature in black ink, appearing to read 'MD Randall', with a stylized flourish at the end.

M D Randall BSc(Eng) CEng MCIBSE MIOA





CERTIFICATE OF CALIBRATION



Date of Issue: 04 September 2020

Certificate Number: UCRT20/1843

Calibrated at & Certificate issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page	1	of	2	Pages
Approved Signatory				
K. Mistry				

Customer ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes
MK5 8HL

Order No. ANV MS HIRE
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00220558
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	10558
Rion	Microphone	UC-59	06710
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 02 September 2020

ANV Job No. UKAS20/09479

Date Calibrated 04 September 2020

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	05 December 2019	UCRT19/2325	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



CERTIFICATE OF CALIBRATION

Certificate Number

UCRT20/1843

UKAS Accredited Calibration Laboratory No. 0653

Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-74-002	
Calibrator cal. date	19 August 2020	
Calibrator cert. number	UCRT20/1789	
Calibrator cal cert issued by	0653	
Calibrator SPL @ STP	94.02 dB	Calibration reference sound pressure level
Calibrator frequency	1001.89 Hz	Calibration check frequency
Reference level range	25 - 130 dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	22.63	22.84	± 0.30 °C
Humidity	53.7	52.4	± 3.00 %RH
Ambient Pressure	101.06	101.05	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0 dB	Adjusted indicated level	94.0 dB
The uncertainty of the associated calibrator supplied with the sound level meter ±			0.10 dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device -				UR = Under Range Indicated			
Weighting		A		C		Z	
		12.2	dB	UR	15.8	dB	UR
						23.5	dB
Uncertainty of the electrical self generated noise ±						0.12	dB
							UR

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

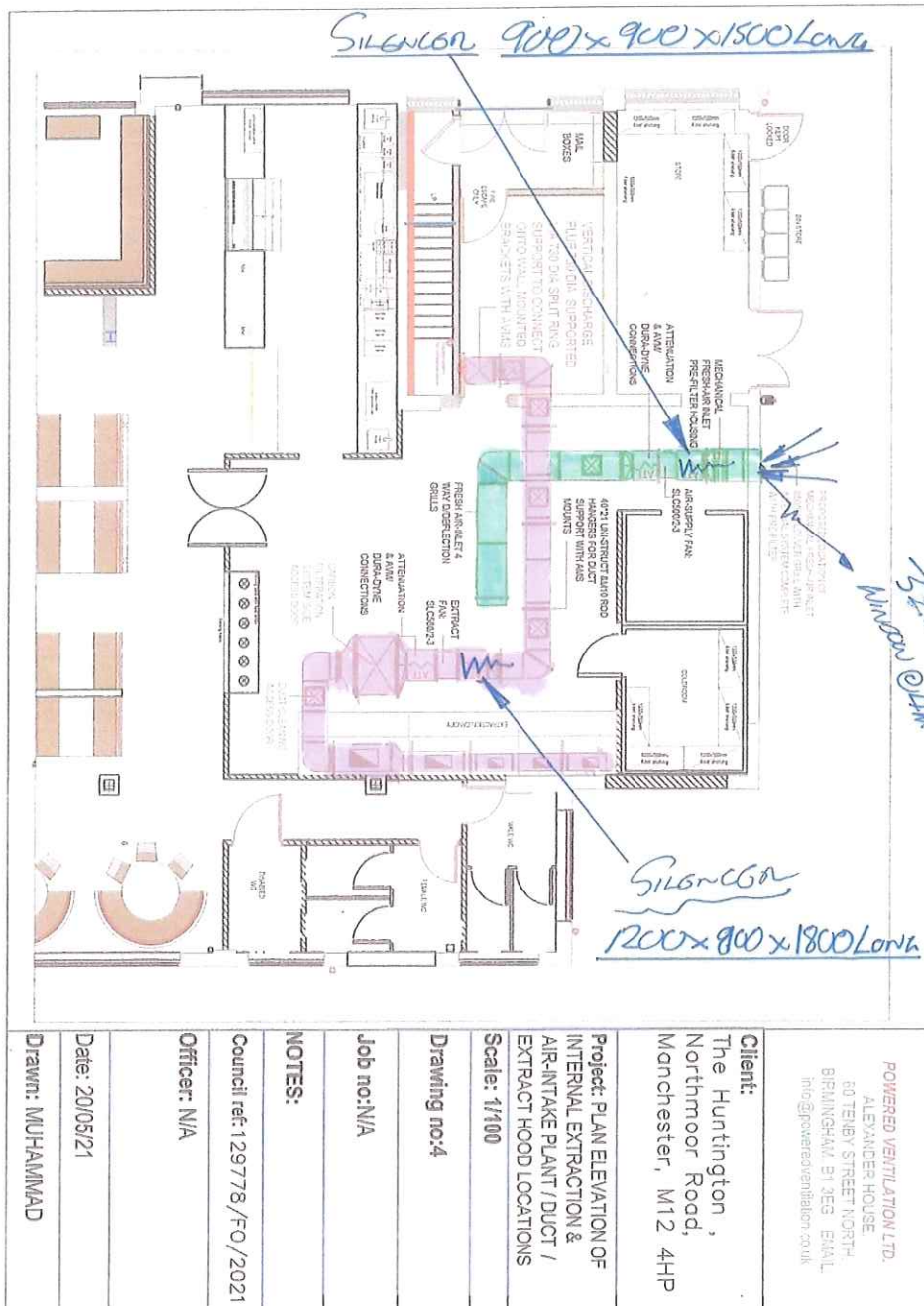
Calibrated by: B. Bogdan

R 2

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

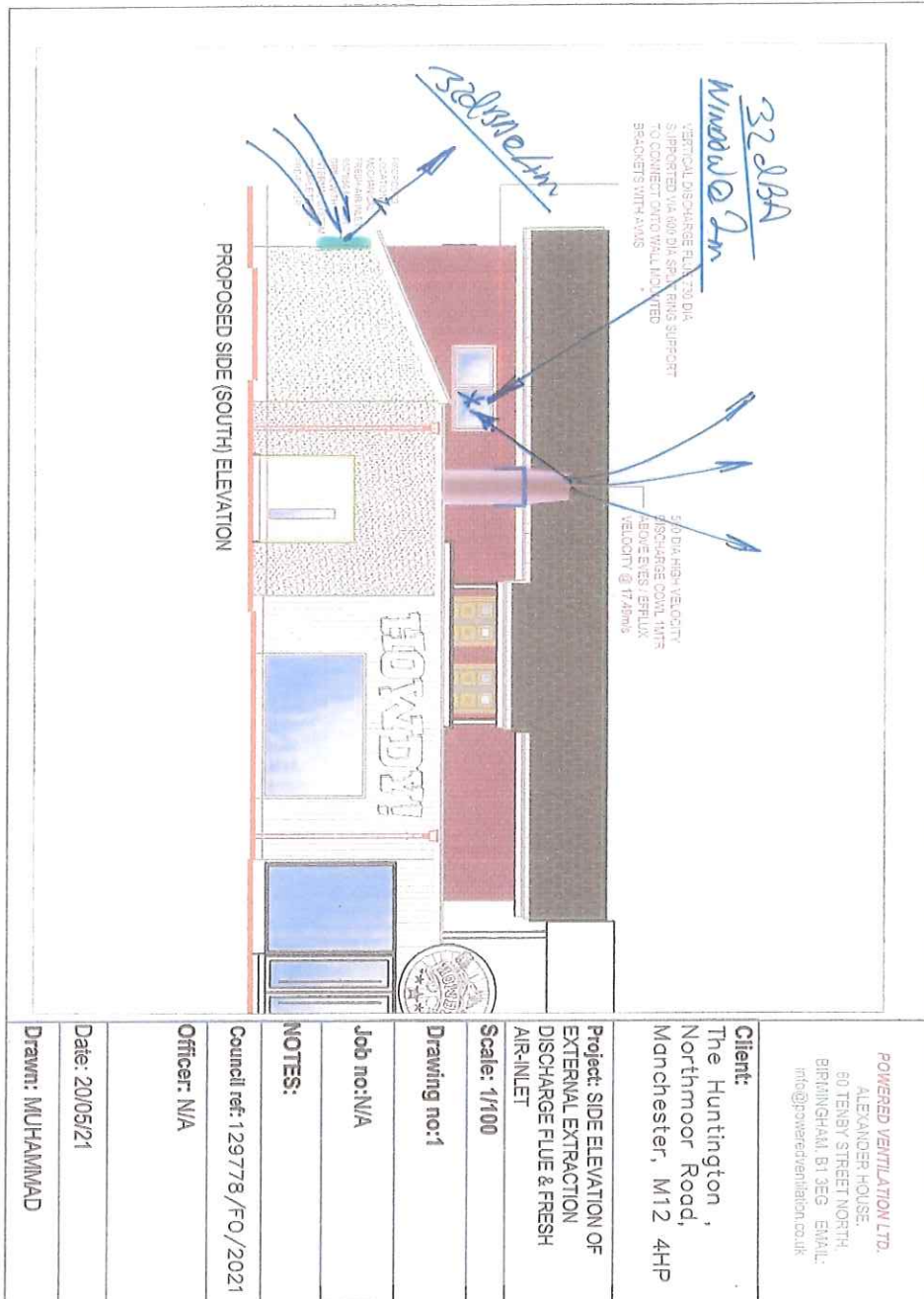
None





Ref: M2471

[illegible]



Ref: 129778



	POWERED VENTILATION LTD. ALEXANDER HOUSE 30 TENBY STREET NORTH BIRMINGHAM, B1 3EG EXHALL info@poweredventilation.co.uk
Client: The Huntington, Northmoor Road, Manchester, M12 4HP	Project: FRONT ELEVATION OF EXTERNAL EXTRACTION DISCHARGE FLUE
Scale: 1/100	Drawing no: 3
Job no: N/A	NOTES:
Council ref: 129778/F0/2021	Officer: N/A
Date: 20/05/21	Drawn: MUHAMMAD

Ref: 129778/F0/2021

[illegible]

Ref: 100/14714



	L/A	63	125	250	500	1k	2k	4k	8k
SUPPLY FAN SWL @ 2-3 PS									
3.6Gm ³ /SEC SUPP Fan Swl		74	81	88	85	88	86	83	79
650 → 650 Duct/m		0	0	0	0	0	0	0	0
FILTER		3	3	3	3	3	3	3	3
650x650 LEAKAGE 0.4225 m ² SWL		7	3	0	0	0	0	0	0
SWL @ INTAKE		74	75	85	82	85	83	80	76
SWL → SPL @ 4m		20	20	20	20	20	20	20	20
Hemispherical Radiation									
SPL @ 4m		54	55	65	62	65	63	60	56
A' - WEIGHTING		-20	-10	-9	-3	0	+1	+1	-1
		28	39	56	59	65	64	61	55
			39	61		68		62	
				61			69		
						70 dB(A)			
SILENCE LOCATIONS									
RMS20/100/150 33% FA		8	15	26	43	53	53	45	32
RECTANGULAR SPLITTER 900mm		20	24	30	16	12	11	16	23
WDS x 900mm HIGH x 1500mm			25		30		15		24
LONG ΔP = 50 Pa @ 3.6 Gm ³ /S				31				25	
Resultant SPL @ 4m WITH Silencer						32 dB(A)			

Lot: 11174

**ELTA FANS LTD (BUILDING SERVICES)**

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Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: mailbox@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

ELTA FAN DATA FOR MODEL SLC560/2-3

Location: 129778/FO/2021

Designation: EXTRACTION

Fan Code: SLC560/2-3

Requirements

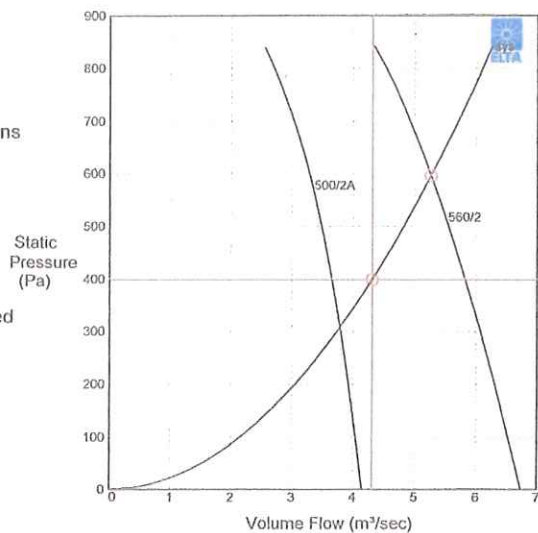
Volume: 4.31 m³/s
Static Pressure: 400 Pa
Selection Pressure: 400 Pa at std conditions
Operating Duty: 5.264 m³/s at 597 Pa
Temperature: 20 deg C
Altitude: 0 m

Fan Data (at STP)

Type: Revolution Long Cased Axial Fan
Diameter: 560 mm
Speed: 2920 RPM
Weight: 96 kg

Motor Data (at STP)

Motor Power: 7.5 kW
Electrical Supply: 415V@50Hz
Motor Speed Poles: 2 Poles

**SOUND DATA**

Spectrum (Hz)	63	125	250	500	1K	2K	4K	8K	dBA @ 3m
Sound Power (dB)	91	88	92	93	90	88	86	83	75

Note: Levels are quoted as in-duct values. dBA values are average spherical free-field for comparative use only.

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LSF: MNC/4714

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Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: mailbox@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

ELTA FAN DATA FOR MODEL SLC500/2-3B

Location: 129778/FO/2021

Designation: AIR-INLET

Fan Code: SLC500/2-3B

Requirements

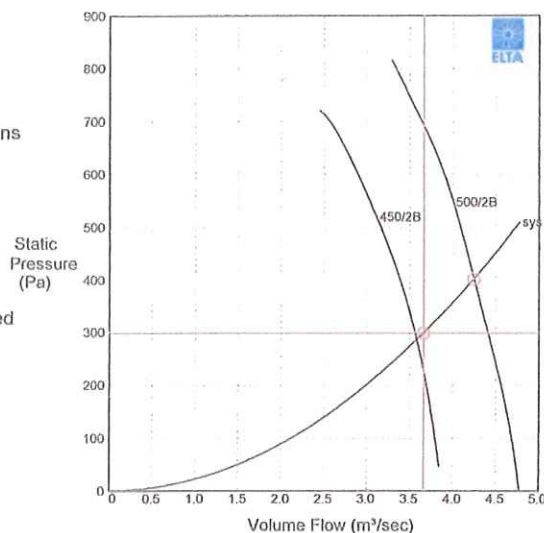
Volume: 3.66 m³/s
Static Pressure: 300 Pa
Selection Pressure: 300 Pa at std conditions
Operating Duty: 4.244 m³/s at 403 Pa
Temperature: 20 deg C
Altitude: 0 m

Fan Data (at STP)

Type: Revolution Long Cased
Axial Fan
Diameter: 500 mm
Speed: 2935 RPM
Weight: 52 kg

Motor Data (at STP)

Motor Power: 5.5 kW
Electrical Supply: 415V@50Hz
Motor Speed Poles: 2 Poles

**SOUND DATA**

Spectrum (Hz)	63	125	250	500	1K	2K	4K	8K	dBA @ 3m
Sound Power (dB)	84	81	88	85	88	86	83	79	71

Note: Levels are quoted as in-duct values. dBA values are average spherical free-field for comparative use only.

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Res: 129778/4714

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Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: mailbox@eltafans.co.uk
 46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

**ELTA FAN DATA FOR MODEL SLC560/2-3**

Location: 129778/FO/2021

Designation: EXTRACTION

Fan Code: **SLC560/2-3****Requirements**

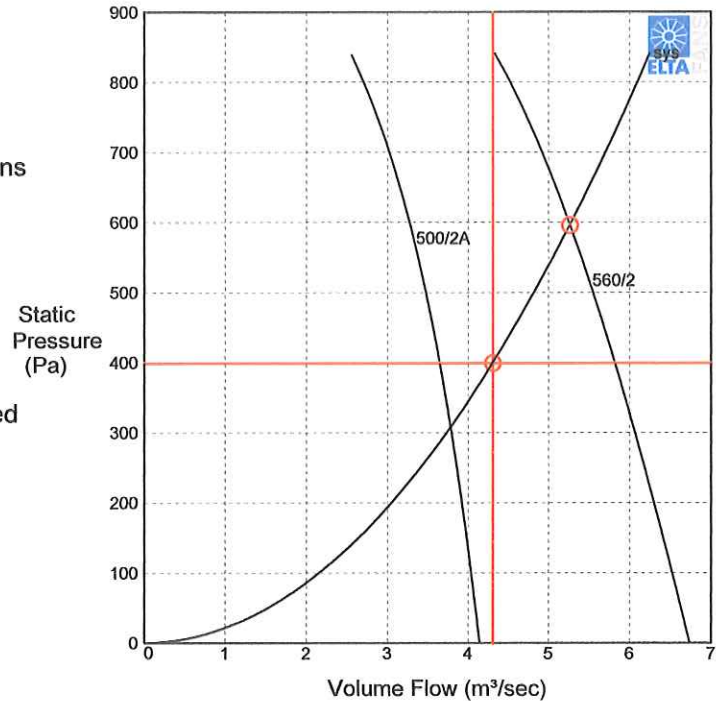
Volume: 4.31 m³/s
 Static Pressure: 400 Pa
 Selection Pressure: 400 Pa at std conditions
 Operating Duty: 5.264 m³/s at 597 Pa
 Temperature: 20 deg C
 Altitude: 0 m

Fan Data (at STP)

Type: Revolution Long Cased
 Axial Fan
 Diameter: 560 mm
 Speed: 2920 RPM
 Weight: 96 kg

Motor Data (at STP)

Motor Power 7.5 kW
 Electrical Supply: 415V@50Hz
 Motor Speed Poles: 2 Poles

**SOUND DATA**

Spectrum (Hz)	63	125	250	500	1K	2K	4K	8K	dBA @ 3m
Sound Power (dB)	91	88	92	93	90	88	86	83	75

Note: Levels are quoted as in-duct values. dBA values are average spherical free-field for comparative use only.

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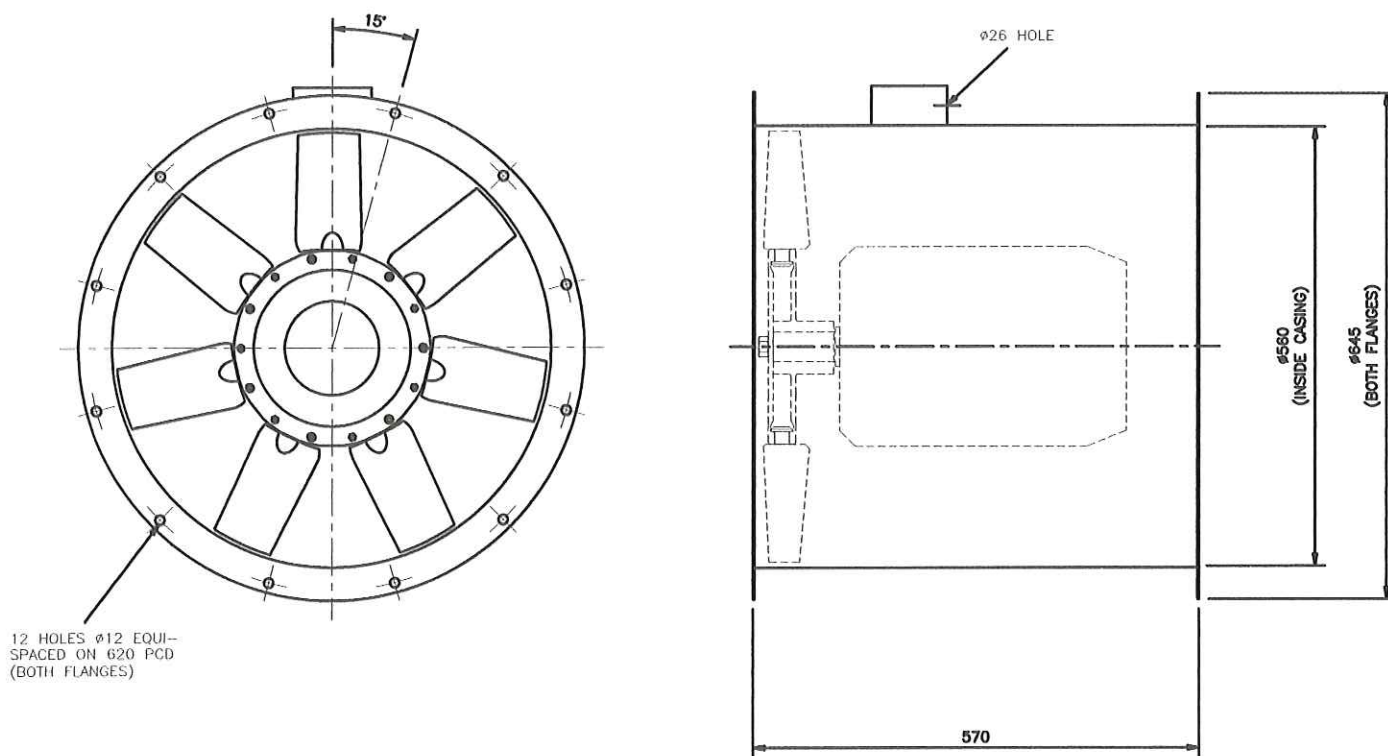
Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: mailbox@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

**DRAWING FOR MODEL SLC560/2-3**

Location: 129778/FO/2021

Designation: EXTRACTION

Version 2 On-going product improvements may result in dimensional changes without notice.



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Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: mailbox@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

**ELTA FAN DATA FOR MODEL SLC500/2-3B**

Location: 129778/FO/2021

Designation: AIR-INLET

Fan Code: **SLC500/2-3B****Requirements**

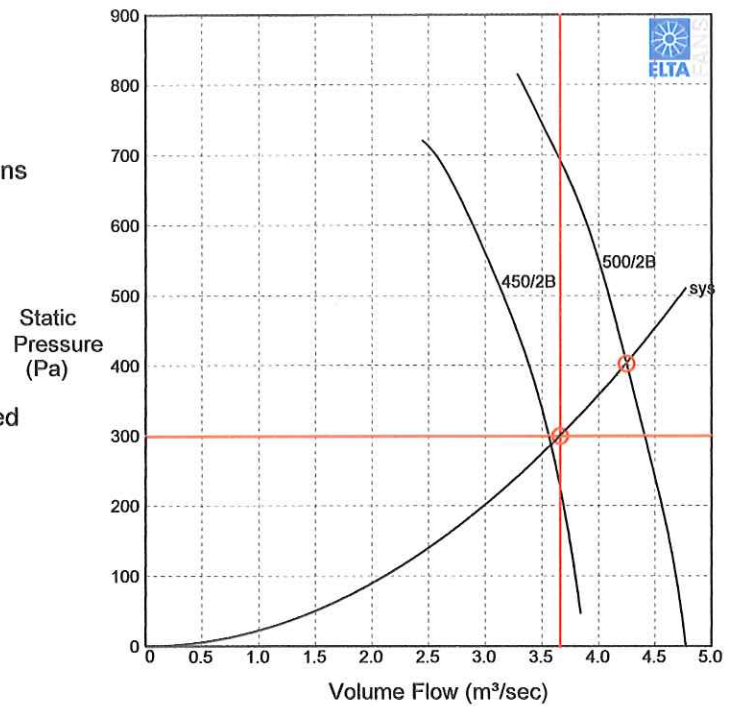
Volume: 3.66 m³/s
Static Pressure: 300 Pa
Selection Pressure: 300 Pa at std conditions
Operating Duty: 4.244 m³/s at 403 Pa
Temperature: 20 deg C
Altitude: 0 m

Fan Data (at STP)

Type: Revolution Long Cased
Axial Fan
Diameter: 500 mm
Speed: 2935 RPM
Weight: 52 kg

Motor Data (at STP)

Motor Power 5.5 kW
Electrical Supply: 415V@50Hz
Motor Speed Poles: 2 Poles

Density: 1.2 kg/m³**SOUND DATA**

Spectrum (Hz)	63	125	250	500	1K	2K	4K	8K	dBA @ 3m
Sound Power (dB)	84	81	88	85	88	86	83	79	71

Note: Levels are quoted as in-duct values. dBA values are average spherical free-field for comparative use only.

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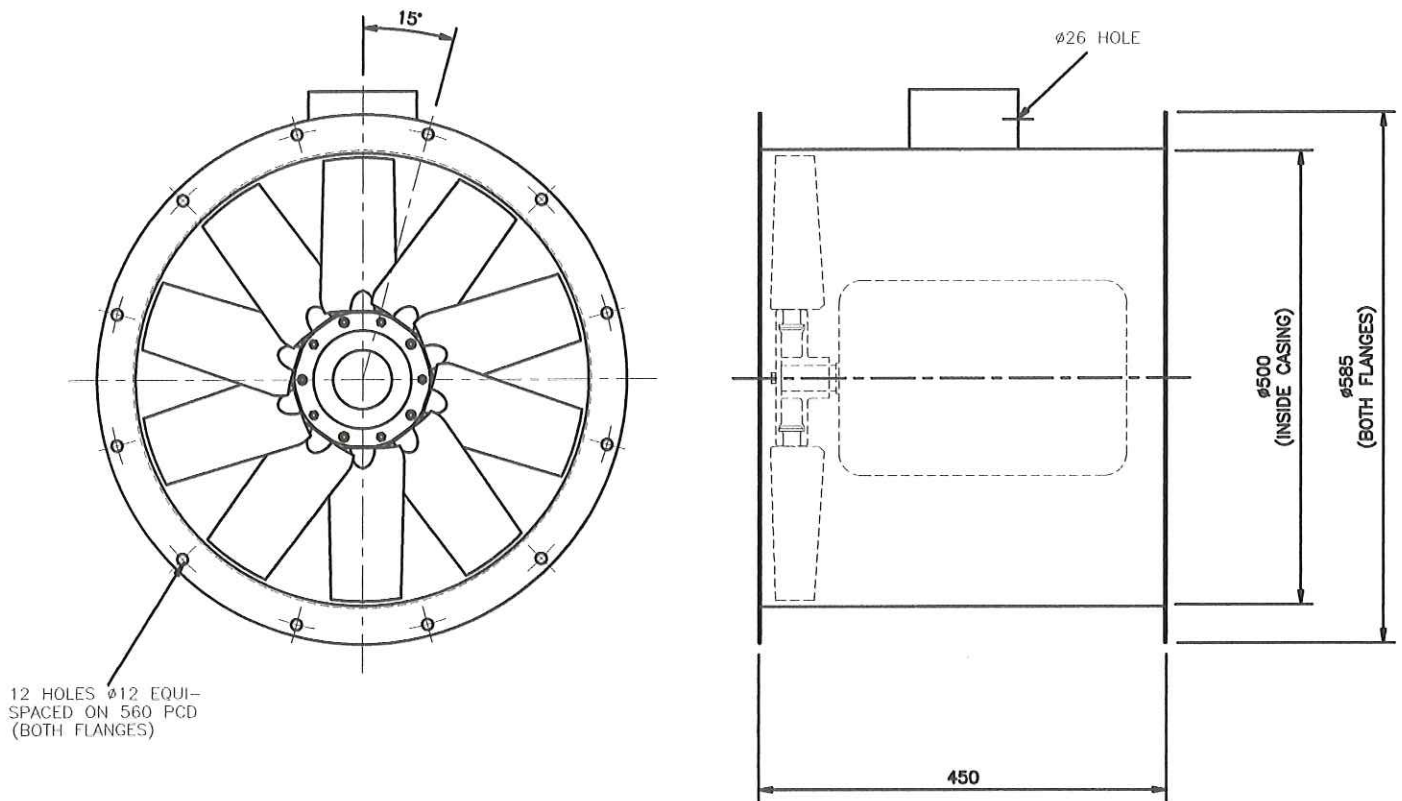


DRAWING FOR MODEL SLC500/2-3B

Location: 129778/FO/2021

Designation: AIR-INLET

Version 2 On-going product improvements may result in dimensional changes without notice.



POWERED VENTILATION LTD.
ALEXANDER HOUSE,
60 TENBY STREET NORTH,
BIRMINGHAM, B1 3EG EMAIL:
info@poweredventilation.co.uk

Client:
The Huntington ,
Northmoor Road,
Manchester, M12 4HP

Project: SIDE ELEVATION OF
EXTERNAL EXTRACTION
DISCHARGE FLUE & FRESH
AIR-INLET

Scale: 1/100

Drawing no:1

Job no:N/A

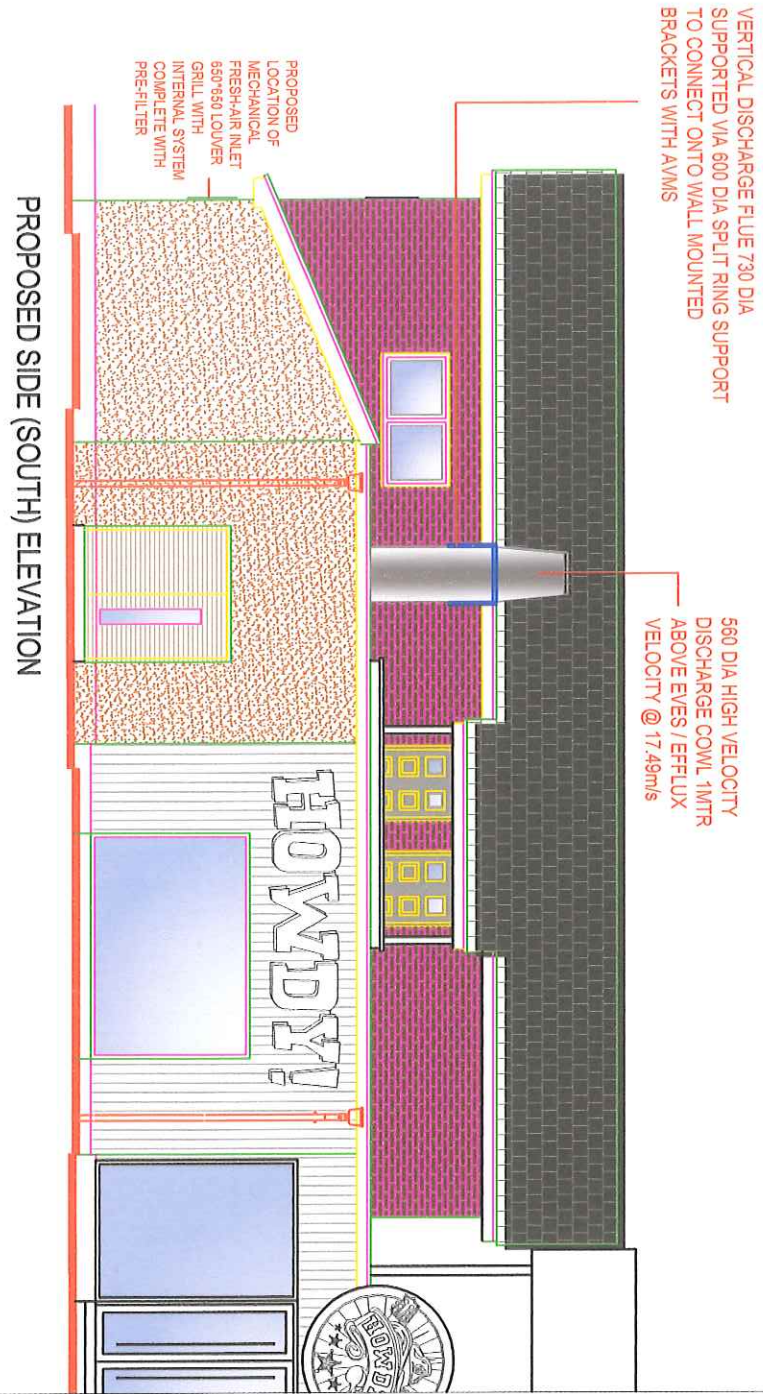
NOTES:

Council ref: 129778/FO/2021

Officer: N/A

Date: 20/05/21

Drawn: MUHAMMAD



POWERED VENTILATION LTD.
ALEXANDER HOUSE,
60 TENBY STREET NORTH,
BIRMINGHAM, B1 3EG EMAIL:
info@poweredventilation.co.uk

Client:
The Huntington ,
Northmoor Road,
Manchester, M12 4HP

Project: REAR ELEVATION OF
EXTERNAL EXTRACTION
DISCHARGE FLUE & FRESH
AIR-INLET

Scale: 1/100

Drawing no:2

Job no:N/A

NOTES:

Council ref: 129778/FO/2021

Officer: N/A

Date: 20/05/21

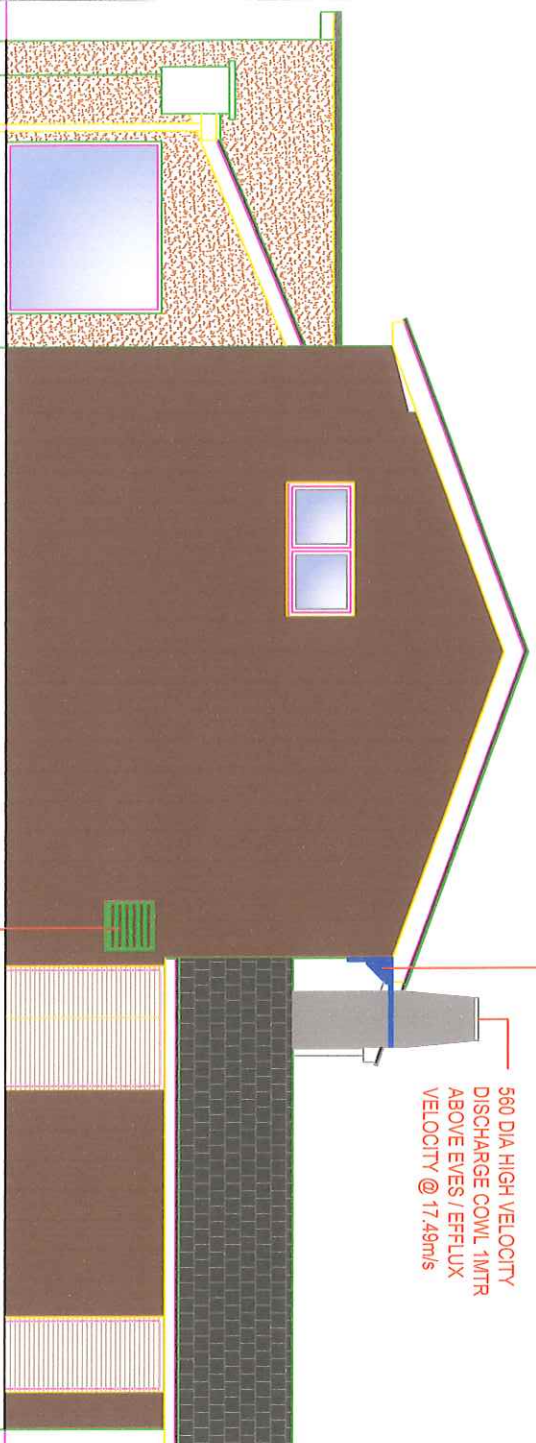
Drawn: MUHAMMAD

PROPOSED LOCATION OF MECHANICAL
FRESH-AIR INLET 600 DIA LOUVER GRILL WITH
INTERNAL SYSTEM COMPLETE WITH PRE-FILTER

PROPOSED REAR (WEST) ELEVATION

VERTICAL DISCHARGE FLUE 730 DIA
SUPPORTED VIA 600 DIA SPLIT RING SUPPORT
TO CONNECT ONTO WALL MOUNTED
BRACKETS WITH AVMS

560 DIA HIGH VELOCITY
DISCHARGE COWL 1MTR
ABOVE EYES / EFFLUX
VELOCITY @ 17.49m/s



POWERED VENTILATION LTD.
 ALEXANDER HOUSE,
 60 TENBY STREET NORTH,
 BIRMINGHAM, B1 3EG EMAIL:
info@poweredventilation.co.uk

Client:

The Huntington ,
 Northmoor Road,
 Manchester, M12 4HP

Project: FRONT ELEVATION OF
 EXTERNAL EXTRACTION
 DISCHARGE FLUE

Scale: 1/100

Drawing no: 3

Job no: N/A

NOTES:

Council ref: 129778/FO/2021

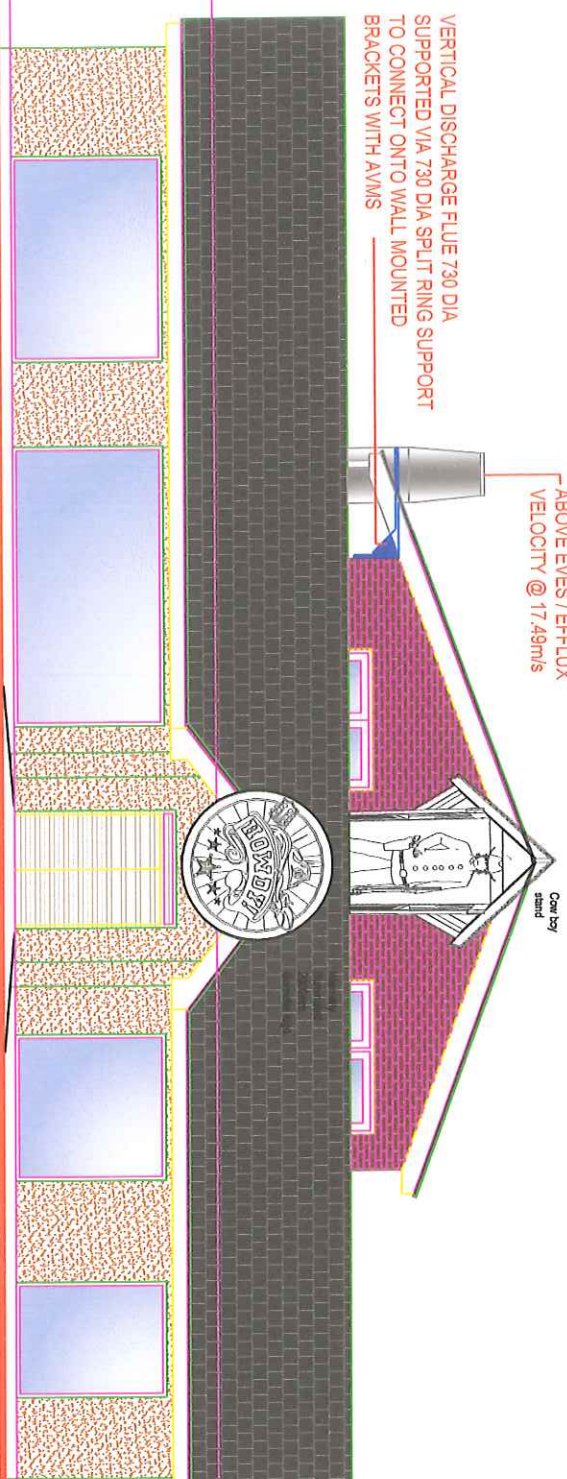
Officer: N/A

Date: 20/05/21

Drawn: MUHAMMAD

560 DIA HIGH VELOCITY
 DISCHARGE COWL 1MTR
 ABOVE EYES / EFFLUX
 VELOCITY @ 17.49m/s

VERTICAL DISCHARGE FLUE 730 DIA
 SUPPORTED VIA 730 DIA SPLIT RING SUPPORT
 TO CONNECT ONTO WALL MOUNTED
 BRACKETS WITH AVMS



PROPOSED FRONT (EAST) ELEVATION

POWERED VENTILATION LTD.
ALEXANDER HOUSE,
60 TENBY STREET NORTH,
BIRMINGHAM, B1 3EG EMAIL:
info@poweredventilation.co.uk

Client:
The Huntington ,
Northmoor Road,
Manchester, M12 4HP

Project: PLAN ELEVATION OF
INTERNAL EXTRACTION &
AIR-INTAKE PLANT / DUCT /
EXTRACT HOOD LOCATIONS

Scale: 1/100

Drawing no:4

Job no:N/A

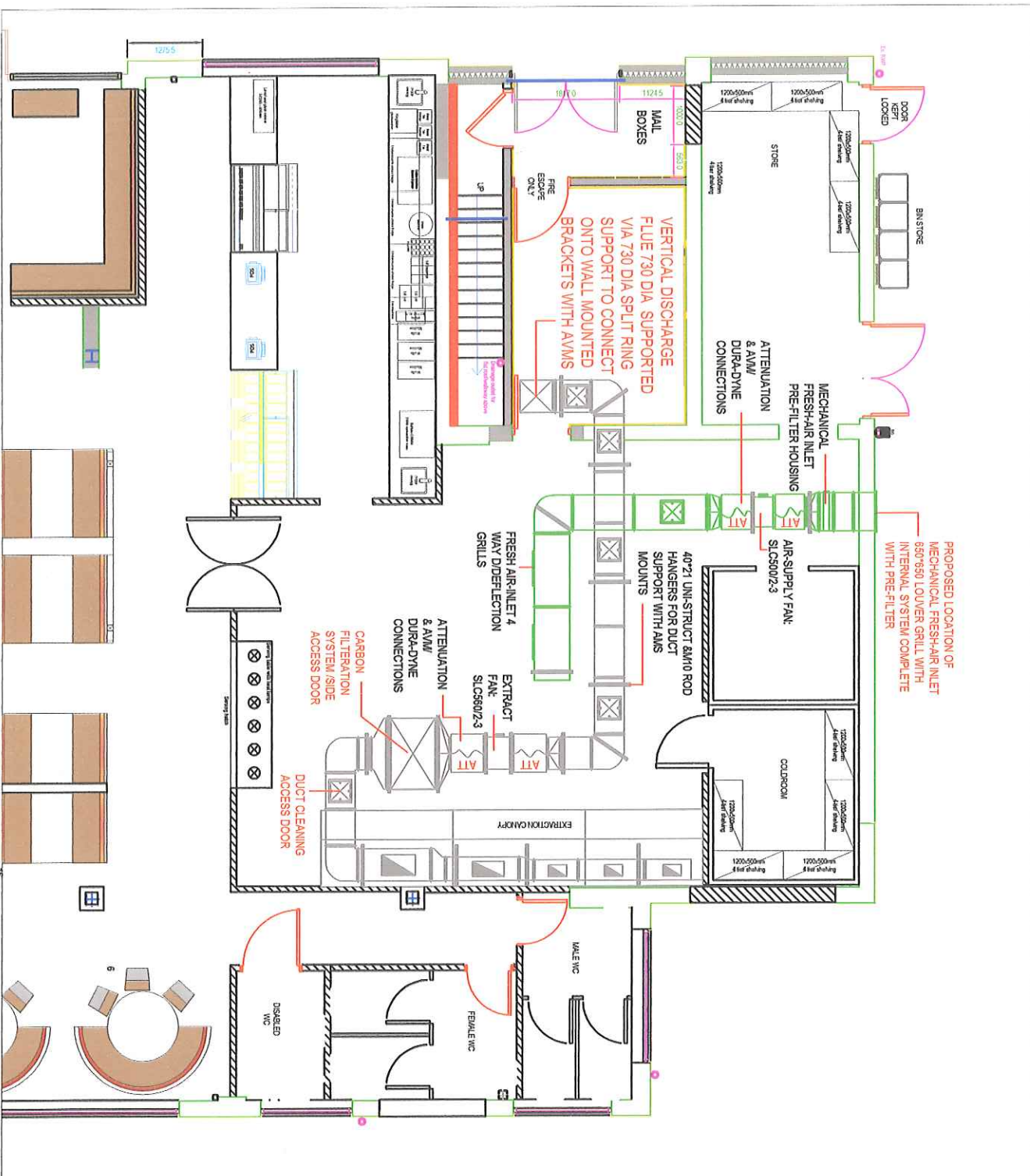
NOTES:

Council ref: 129778/FO/2021

Officer: N/A

Date: 20/05/21

Drawn: MUHAMMAD



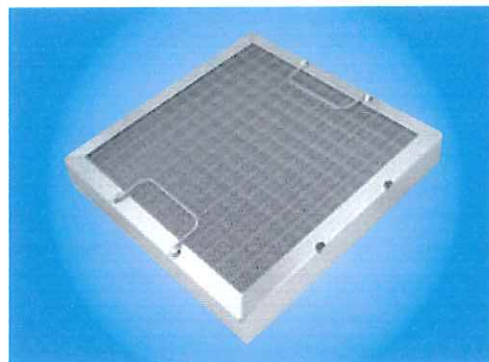
Grease Filters

by Express-air

Aluminium Frame Galvanised Mesh Grease Filters

Order Ref	Size Inches	Size mm			Capacity
	W x H x D	W	H	D	m ³ /s *
EAGF12121	12 x 12 x 1	292	292	20	0,19
EAGF12122	12 x 12 x 2	292	292	45	0,19
EAGF16161	16 x 16 x 1	394	394	20	0,33
EAGF16162	16 x 16 x 2	394	394	45	0,33
EAGF18181	18 x 18 x 1	445	445	20	0,42
EAGF18182	18 x 18 x 2	445	445	45	0,42
EAGF20101	20 x 10 x 1	495	241	20	0,26
EAGF20102	20 x 10 x 2	495	241	45	0,26
EAGF20161	20 x 16 x 1	495	394	20	0,41
EAGF20162	20 x 16 x 2	495	394	45	0,41
EAGF20201	20 x 20 x 1	495	495	20	0,52
EAGF20202	20 x 20 x 2	495	495	45	0,52
EAGF24241	24 x 24 x 1	597	597	20	0,75
EAGF24242	24 x 24 x 2	597	597	45	0,75
EAGF25202	25 x 20 x 2	662	495	45	0,65

*capacity based on Initial clean resistance of 30Pa @ 2.5m/s velocity



Aluminium Baffle Filters

Order Ref	Size Inches	Size mm			Capacity m ³ /s against Resistance Pa *			
	W x H x D	W	H	D	50pa	100pa	150pa	200pa
EABFA16162	16 x 16 x 2	394	394	45	0,12	0,16	0,20	0,24
EABFA18182	18 x 18 x 2	445	445	45	0,20	0,28	0,35	0,39
EABFA20102	20 x 10 x 2	495	241	45	0,12	0,16	0,20	0,24
EABFA20162	20 x 16 x 2	495	394	45	0,20	0,28	0,35	0,39
EABFA20202	20 x 20 x 2	495	495	45	0,26	0,38	0,46	0,51
EABFA24242	24 x 24 x 2	597	597	45	0,35	0,50	0,66	0,71



Stainless Steel Baffle Filters

Order Ref	Size Inches	Size mm			Capacity m ³ /s against Resistance Pa *			
	W x H x D	W	H	D	50pa	100pa	150pa	200pa
EABFS16162	16 x 16 x 2	394	394	45	0,12	0,16	0,20	0,24
EABFS18182	18 x 18 x 2	445	445	45	0,20	0,28	0,35	0,39
EABFS20102	20 x 10 x 2	495	241	45	0,12	0,16	0,20	0,24
EABFS20162	20 x 16 x 2	495	394	45	0,20	0,28	0,35	0,39
EABFS20202	20 x 20 x 2	495	495	45	0,26	0,38	0,46	0,51
EABFS24242	24 x 24 x 2	597	597	45	0,35	0,50	0,66	0,71

* The resistance quoted above is both the initial and operating resistance due to the self draining capacity of the filter.

O & M INSTRUCTION

PRODUCT GROUP 1130 – DISPOSABLE PLEATED PANELS (GRADE G4 TO EN779)

Safety

It is recommended that industrial gloves, overalls, eye protection and nuisance dust masks are utilised when changing filters which have been subjected to natural air, as opposed to air drawn from processes, where full risk assessments should be performed prior to changing. For some filters, an assessment regarding manual handling will need to be made.

Changing of filters should be carried out by experienced or trained personnel, in accordance with safety requirements as defined by the "Control of Substances Hazardous to Health (COSHH) Regulations. ie. Someone who fully understands the design, operation and implications of the product and its use.

General

Withdraw and dispose of the dirty filter and replace with a clean panel.

Recommended discard resistance is 0.5" w.g. (125 Pa) in excess of clean resistance for a 2" panel, for a 4" panel 0.60" w.g. (150 Pa).

Disposal of Air Filters Including Personal Protective Equipment

- Filters and PPE have been damaged prior to use can be disposed of as normal industrial waste.
- Filters and PPE soiled with exterior air can be disposed of as normal industrial waste.
- Filters and PPE soiled by process air, bacterial, toxic and/or radioactive matter must be disposed of as Hazardous Waste in accordance with local regulations of the site and Environmental Health. Legislation prohibits removal of this waste from the site location.

For further information please contact Airclean Ltd

PLEATED PANEL AIR FILTER G4 to EN779:2012

Applications

The Pleated Panel Air Filter is a medium efficiency disposable air filter, suitable for ventilation and air conditioning systems which require a higher efficiency and greater dust holding capacity than can be achieved with glass or synthetic panels.

The G4 filter can be used where glass panels are undesirable, such as in the food industry and hospitals.

Typically, G4 panel filters are used as pre filters on supply air systems to High Performance Bag Filters, or to protect heating or cooling coils from dust build up which leads to system inefficiency. Another common place to see G4 Pleated Panel Air Filters is to protect fans in extract systems for office blocks or kitchen extract systems.



Description

Pleated Panel Filters consist of a dry non-woven fabric media which is pleated to give an extended surface area, producing a low initial resistance for the same air volume, making this an energy efficient filter. The pleat is supported by an expanded galvanised steel mesh.

The pleated air filter media is contained within the air filter by a rigid all-cardboard casing. The filter is sealed together using hot melt adhesive glues to ensure a highly rigid and quality disposable panel air filter.

Three frame options are available; Standard, Airclean Moisture Resistant (AMR) and Metal. Each offering an increased strength and resilience against moisture and humidity experienced in supply air from atmosphere.

Technical

The pleated air filter media is Flame Retardant to UL Class II

Max Operating Temp 80 Deg C

Dust Holding Capacity for 50mm Filter = 840 g/m² Dust Holding Capacity for 100mm Filter = 1260 g/m²

Nominal to Actual Size: less 6mm on H & W, 3mm on Depth

PLEATED PANEL FILTER STANDARD SIZES

Size		Flow Rate			Part Numbers					
OT Inches	Actual mm	22mm m ³ /s	47mm m ³ /s	97mm m ³ /s	1" (22mm)		2" (47mm)		4" (97mm)	
					STD	AMR	STD	AMR	STD	AMR
10 x 10	242 x 242	0.12	0.15	0.18	1130101	1134121	1130201	1134221	1130401	1134421
12 x 12	289 x 289	0.17	0.21	0.25	1130102	1134122	1130202	1134222	1130402	1134422
15 x 15	369 x 369	0.27	0.34	0.41	1130103	1134123	1130203	1134223	1130403	1134423
18 x 18	445 x 445	0.40	0.50	0.59	1130104	1134124	1130204	1134224	1130404	1134424
20 x 10	495 x 242	0.24	0.30	0.36	1130106	1134125	1130206	1134225	1130406	1134425
20 x 16	495 x 394	0.39	0.49	0.59	1130108	1134126	1130208	1134226	1130408	1134426
20 x 20	495 x 495	0.49	0.61	0.74	1130110	1134127	1130210	1134227	1130410	1134427
25 x 16	620 x 394	0.49	0.61	0.73	1130111	1134128	1130211	1134228	1130411	1134428
25 x 20	620 x 495	0.61	0.77	0.92	1130112	1134129	1130212	1134229	1130412	1134429
24 x 12	594 x 289	0.34	0.43	0.51	1130113	1134130	1130213	1134230	1130413	1134430
24 x 20	594 x 495	0.59	0.74	0.88	1130114	1134131	1130214	1134231	1130414	1134431
24 x 24	594 x 594	0.71	0.88	1.06	1130115	1134132	1130215	1134232	1130415	1134432

STD: Standard Cardboard Frame

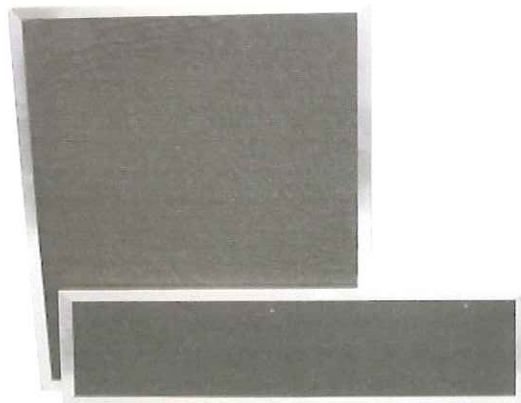
AMR: Airclean Moisture Resistant Cardboard Frame

Activated Carbon Filters - Panels Odour and Gas Removal

Applications

The disposable Activated Carbon Filter Panel, can be sized and used in a wide variety of odour reduction applications.

Multiple Carbon Panel Filters are often used in V formations enabling sufficient contact times with air to offer high levels of gas and odour removal from the air stream.



Description

Activated Carbon Panel Filters are generally manufactured using the bonding process to provide a rigid panel which is often called a "Biscuit". The bonded carbon biscuit can be framed in a metal channel so that it can be easily slid into channel holding frames mounted into ductwork or filter housings. The panel is finished in a "fabric facia" which minimises the dusting from the panel.

Activated Carbon Panel Filters can also be produced using a loose fill technique, which can offer an improved rate of absorbency. Despite the improved rate of absorbency the Activated Carbon Panels capacity will remain the same. The panels are designed to minimise the risk of bypass due to settlement, and for this reason their installation should be designed to be horizontal,

Technical

Nominal thickness	Actual thickness	Pressure drop	Face velocity m/s
25mm	22mm	45 Pa	0.22 (43fpm)
22mm	19mm	40 Pa	0.19 (37fpm)

Maximum Operating Temperature: 40 Deg C

Maximum Operating Humidity: 80% RH

Holding Frames and Cases

Holding frames and casings for Activated Carbon Panel Filters are available singularly or in multiples, and can be manufactured to suit non-standard sizes and special applications.

See Catalogue Section 8 (code AC8) for full information.



AHU Style Side Withdrawal Filter Housing (1908)



Fully Welded Side Withdrawal Filter Housing (1840)

Guide to the Gaseous Adsorption Level for Grade 50 Activity Carbon

A = 20 - 50% adsorption
B = 10 - 20%

C = 1 - 10%
D = under 1%

	Chemical	Index	Common Source of Chemical
1	ACETAHALDEHYDE	C	REAGENT
2	ACETIC ACID	A	REAGENT, SOUR VINEGAR
3	ACETIC ANHYDRIDE ACID	A	
4	ACETONE	B	SOLVENT
5	ACETYLENE	D	WELDING AND CUTTING
6	ACROLEIN	B	
7	ACRYLALDEHYDE	B	AEROLEIN, BURNING FATS
8	ACRYLIC ACID	A	
9	ADHESIVES	A	
10	AMINES	C	
11	AMMONIA	D	
12	AMYL ACETATE	A	LACQUER SOLVENT
13	AMYL ALCOHOL	A	FUSEL OIL
14	AMYL ETHER	A	
15	ANILINE	A	
16	ANIMAL ODOURS	A	
17	BENZALDEHYDE	A	
18	BENZENE	A	BENZOL, PAINT SOLVENT & REMOVER
19	BROMINE	A	
20	BUTADIENE	C	
21	BUTANE	C	HEATING GAS
22	BUTYL ACETATE	A	LACQUER SOLVENT
23	BUTYL ALCOHOL	A	SOLVENT
24	BUTYL CHLORIDE	A	SOLVENT
25	BUTYL ETHER	A	SOLVENT
26	BUTYLENE	B	
27	BUTYRALDEHYDE	B	PRESENT IN INTERNAL COMBUSTION EXHAUST - DIESEL
28	BUTYRIC ACID	A	
29	BUTYRIC ACID	A	SWEAT, BODY ODOUR
30	CAMPHOR	A	
31	CAPROALDEHYDE	A	
32	CAPRYLIC ACID	A	ANIMAL ODOUR
33	CARBOLIC ACID	A	
34	CARBON DIOXIDE	A	
35	CARBON DISULPHIDE	B	
36	CARBON MONOXIDE	D	
37	CARBON TETRACHLORIDE	A	SOLVENT, CLEANING FLUID, FIRE EXTINGUISHER
38	CELLOSOLVE ACETATE	A	
39	CELLOSOLVE ETHER	A	
40	CHLORINE	B	
41	CHLORO PICRIN	A	
42	CHLOROBENZINE	A	
43	CHLOROBUTADIENE	A	
44	CHLOROFORM	A	
45	CHLORONITROPROPANE	A	
46	CITRUS FRUITS	A	
47	COOKING ODOURS	A	
48	CRESOL	A	WOOD PRESERVATIVE
49	CRONTONALDEHYDE	A	SOLVENT, TEAR GAS
50	CYCLOHEXANE	A	
51	CYCLOHEXANOL	A	
52	DECANE	A	INGREDIENT OF KEROSENE

53	DEGREASING SOLVENTS	A	
54	DEODERISERS	B	
55	DETERGENTS	A	
56	DIBROMOETHANE	A	
57	DICHLOROBENZINE	A	
58	DICHLORODIFLUORO ETHANE	A	
59	DICHLORODIFLUORO METHANE	B	
60	DICHLOROETHANE	A	
61	DICHLOROETHYL ETHER	A	
62	DICHLOROETHYLENE	A	
63	DICHLROMETHANE	A	
64	DICHLROMONOFUORO METHANE	B	
65	DICHLOROPROPANE	A	
66	DICHLOROTETRAFLUORO ETHANE	B	
67	DIETHYL AMINE	B	
68	DIETHYL ANILINE	A	
69	DIETHYL KETONE	A	SOLVENT
70	DIMETHYL AMINE	B	
71	DIMETHYL SULPHATE	A	
72	DIOXAN ETHER	A	
73	DIPROPYL KETONE	A	
74	ETHANE	D	
75	ETHYL ACETATE	A	LACQUER SOLVENT
76	ETHYL ACRYLATE	A	
77	ETHYL ALCOHOL	A	GRAIN ALCOHOL
78	ETHYL AMINE	B	
79	ETHYL BROMIDE	B	
80	ETHYL CHLORIDE	B	REFRIGERANT, ANESTHETIC
81	ETHYL ETHER	B	MEDICAL ETHER, REAGENT
82	ETHYL FORMATE	B	
83	ETHYL MERCAPTAN	A	GARLIC, ONION, SEWER
84	ETHYLENE	D	MORE RETENTIVITY BY REACTION,
85	ETHYLENE CHLOROHYDRIN	A	
86	ETHYLENE DICHLORIDE	A	
87	ETHYLENE OXIDE	B	
88	EXYLENE	A	
89	FLUOROTRICHLOROMETHANE	B	
90	FORMALDEHYDE	C	DISINFECTANT, PLASTIC INGREDIENT
91	FORMIC ACID	B	REAGENT
92	FREON	C	
93	GARLIC	A	
94	HEPTANE	A	INGREDIENT OF GASOLINE
95	HEPTYLENE	C	
96	HEXANE	B	INGREDIENT OF GASOLINE
97	HOSPITAL ODOURS	A	
98	HUMAN ODOURS	A	
99	HYDROGEN BROMIDE	C	
100	HYDROGEN CHLORIDE	C	
101	HYDROGEN CYANIDE	B	
102	HYDROGEN FLUORIDE	C	
103	HYDROGEN IODIDE	B	
104	HYDROGEN SULPHIDE	C	OXIDIZES TO INCREASE RETENTIVITY CONSIDERABLY
105	INDOLE	A	IN EXCRETIA
106	IODINE	A	
107	IODOFORM	A	ANTISEPTIC
108	ISO BUTANE	B	
109	ISOPROPYL ACETATE	A	LACQUER SOLVENT

110	ISOPROPYL ALCOHOL	A	SOLVENT
111	ISOPROPYL ETHER	A	SOLVENT
112	LACTIC ACID	A	
113	LEATHER	A	
114	MERCAPTANS	A	
115	MESITYL OXIDE	A	
116	METHANE	D	
117	METHANOL (METHYL)	B	
118	METHYL ACETATE	B	SOLVENT
119	METHYL ACRYLATE	A	
120	METHYL ALCOHOL	B	WOOD ALCOHOL
121	METHYL BROMIDE	B	
122	METHYL BUTYLKETONE	A	
123	METHYL CELLOSOLVE	Q	
124	METHYL CHLORIDE	B	REFRIGERANT
125	METHYL ETHER	A	
126	METHYL FORMATE	B	
127	METHYL ETHYLKETONE	A	SOLVENT
128	METHYL FORMATE	B	
129	METHYL ISOBUTYLKETONE	A	SOLVENT
130	METHYL MERCAPTAN	A	
131	METHYLENE CHLORIDE	A	
132	MONOCHLOROBENZINE	A	
133	MONOFLUOROTRICHORO METHANE	B	
134	n-DECANE	D	
135	n-HEPTANE	D	
136	n-NONANE	D	
137	n-OCTANE	D	
138	n-OCTYLENE	D	
139	NAPHTHALENE	A	REAGENT, MOTH BALLS
140	NICOTINE	A	TOBACCO
141	NITRIC ACID FUMES	B	
142	NITROBENZENE	A	OIL OF BITTER ALMONDS, OIL OF MIRBANE
143	NITROETHANE	A	
144	NITROGEN DIOXIDE	C	HYDROLYZES TO INCREASE RETENTIVITY
145	NITROGLYCERENE	A	
146	NITROMETHANE	A	
147	NITROPROPANE	A	
148	NITROTOLUENE	A	
149	NONANE	A	INGREDIENT OF KEROSENE
150	OCTANE	A	INGREDIENT OF GASOLENE
151	OZONE	A	GENERATED BY ELECTRICAL DISCHARGE
152	PALMITIC ACID	A	PALM OIL
153	PARADICHLOROBENZENE	A	
154	PENTANE	B	LIGHT NAPHTHA
155	PERCHLOROETHYLENE	A	
156	PERFUMES	A	
157	PETROL	A	
158	PHENOL ACID	A	CARBOLIC ACID, PLASTIC INGREDIENT
159	PHOSGENE	B	
160	PLASTIC	A	
161	POULTRY ODOURS	A	
168	PROPYL CHLORIDE	A	
169	PROPYL ETHER	A	
170	PROPYL MERCAPTAN	A	
171	PROPYLENE	B	COAL GAS
172	PURIFYING ODOURS	B	
173	PUTRESCINE	A	DECAYING FLESH
174	PYRIDINE	A	BURNING TOBACCO
175	RANCID OILS & FATS	A	

176	RESINS	A	
177	RUBBER	A	
178	SKATOLE	A	IN EXCRETA
179	STABLE ODOURS	A	
180	STALE ODOURS	A	
181	STYRENE MONOMER	A	
182	SULPHUR TRIOXIDE	B	HYDROLYZES TO SULPHURIC ACID
183	SULPHUR DIOXIDE	C	OXIDIZES TO SULPHUR TRIOXIDE, COMMON IN CITY ATMOSPHERES
184	SULPHURIC ACID	A	
185	TAR ODOURS	A	
186	TETRACHLORO ETHANE	A	
187	TETRACHLORO ETHYLENE	A	
188	TETRAHYDROTHIOPHENE	A	
189	TOBACCO SMOKE	C	
190	TOILET ODOURS	A	
191	TOLUENE	A	MANUFACTURE OF TNT
192	TOLUIDINE	A	
193	TRICHLORO ETHYLENE	A	
194	TURPENTINE	A	SOLVENT
195	UREA	A	
196	URIC ACID	A	
197	VALERALDEHYDE	A	
198	VALERIC ACID	A	SWEAT, BODY ODOUR, CHEESE
199	VALERIC ALDEHYDE	A	
200	VARNISH	A	
201	VENTILATION SYSTEMS	A	
202	VINEGAR	A	
203	VINYL CHLORIDE	B	
204	WOOD ALCOHOL	B	
205	XYLENE	A	SOLVENT

Free Carbon Testing Service

It is extremely difficult to calculate in advance the life expectancy of an activated carbon filter.

Generally speaking, accurate information regarding concentration and details of all contaminants in the airstream are not available and in any case these are often constantly changing.

However, reasonably accurate life expectancy levels can be obtained by a method known as CTC testing.

Either a small sample of carbon from one of the cells, or a complete panel, should be returned to us together with the date of installation. From this information the contamination level will be assessed in the laboratory, which will indicate the likely remaining useful life of the carbon.

This testing service is totally free of charge to our customers.

O & M INSTRUCTION

PRODUCT GROUP 1120 – DISPOSABLE SYNTHETIC PANELS (GRADE G3 TO EN779)

Safety

It is recommended that industrial gloves, overalls, eye protection and nuisance dust masks are utilised when changing filters which have been subjected to natural air, as opposed to air drawn from processes, where full risk assessments should be performed prior to changing. For some filters, an assessment regarding manual handling will need to be made.

Changing of filters should be carried out by experienced or trained personnel, in accordance with safety requirements as defined by the "Control of Substances Hazardous to Health (COSHH) Regulations. ie. Someone who fully understands the design, operation and implications of the product and its use.

General

Withdraw and dispose of the dirty filter and replace with a clean panel.

Recommended discard resistance is 0.5" w.g. (125 Pa) in excess of clean resistance.

Disposal of Air Filters Including Personal Protective Equipment

- Filters and PPE have been damaged prior to use can be disposed of as normal industrial waste.
- Filters and PPE soiled with exterior air can be disposed of as normal industrial waste.
- Filters and PPE soiled by process air, bacterial, toxic and/or radioactive matter must be disposed of as Hazardous Waste in accordance with local regulations of the site and Environmental Health. Legislation prohibits removal of this waste from the site location.

For further information please contact Airclean Ltd

DISPOSABLE SYNTHETIC MEDIA FILTERS Grade G3 to EN779:2012

Applications

The disposable Synthetic Panel Air Filter is a medium efficiency filter suitable for ventilation and air conditioning systems, providing an improved performance over the fibre glass panel air filter.

The construction of the synthetic panel air filter makes it less liable to shed fibres than a fibre glass panel filter, and therefore suitable for installations such as the food industry and hospitals.



Description

Synthetic Panel Air Filters consist of a dry, graduated, high loft and fully flame retardant synthetic fibre filter media, housed within either a standard rigid cardboard filter frame, or an Airclean Moisture Resistant (AMR) cardboard frame. Air Filter stiffening bars can be provided if required. Panel Filter Stiffening bars can be provided if required.

Our method of manufacture for panel air filters utilise modern hot-melt adhesive techniques, which produce an extremely rigid and robust product.

Technical

The media is Flame Retardant to DIN53438
Max Operating Temp 100 Deg C
Dust Holding Capacity 844 g/m²
Recommended Face Velocity 2.25m/s
Nominal to Actual Size: less 6mm on H & W, 3mm on Depth

STANDARD SYNTHETIC PANEL FILTER SIZES

Size		Flow Rate	Part Numbers	
OT Inches	Actual mm	m ³ /s	1" (22mm)	2" (47mm)
10 x 10	242 x 242	0.13	1120101	1120201
12 x 12	289 x 289	0.19	1120102	1120202
15 x 15	369 x 369	0.31	1120103	1120203
18 x 18	445 x 445	0.44	1120104	1120204
20 x 10	495 x 242	0.27	1120106	1120206
20 x 16	495 x 394	0.43	1120108	1120208
20 x 20	495 x 495	0.55	1120110	1120210
25 x 16	620 x 394	0.55	1120111	1120211
25 x 20	620 x 495	0.69	1120112	1120212
24 x 12	594 x 289	0.39	1120113	1120213
24 x 20	594 x 495	0.66	1120114	1120214
24 x 24	594 x 594	0.79	1120115	1120215

Notes

- * Actual sized filters will be manufactured as ordered +/- 3mm
- * Clean Pressure Drops 1"- 66Pa, 2"- 75Pa based on a Face Velocity of 2.25 m/s
- * Max Size: 625Hx900W

Annex A:

Information Required To Support Planning Application For Commercial Kitchen

Information on Premises:

The number of meals which will be served per day will be around 30-100.

The methods and preparation of cooking will take place during business hours only and not before or after. The cooking style involves using fresh produces with light touches of fresh ground spices.

The types of meal that will be served is Grilled / fast food which involves use of standard spices which are often used in other establishment, the strongest of the odour to be found in this cooking is the use of garlic and onion, the other spices are lightly used and have a low level of odour.

Plans and drawings:

Please find the scaled drawing submitted with this form in the ventilation design scheme.

Pre-filters:

Disposable Synthetic Panel Filters Manufacturers AirClean ltd please see o&m instructions and technical supplied information see documents in ventilation report. To be used with the carbon filtrates system before the carbons which come after the stainless steel baffle filters which are installed on the canopy extract hood. Dimensions 595*595*45

Electrostatic precipitators:

n/a

Carbon filters (where proposed):

Before the fan will be a purpose built carbon filtration discarb unit and will house a pre-filter (to prolong the life of the activated carbon cells) and hold approximately 149 carbon bonded panel cells.

For 0.3 seconds contact time- Typically recommended for Spicy cuisine such as Thai / Indian / Grill & Steakhouse / Fast-food. (1 single carbon panel @ 594 x 594 x 25mm framed will achieve a 0.3 second contact time at 0.029m3/s)

$$\text{DESIGN AIR FLOW RATE } 4.31\text{m}^3/\text{s} / 0.029\text{m}^3/\text{s} = 148.62$$

Therefore a minimum of 149 Extra Duty carbon cells panels must be used.

By rounding the number of carbon filters up from the calculations, it allows some room for any inefficiency in the odour control.

Cleaning and maintenance

The carbon cells should be inspected for carbon testing every 3 months for results in changing, again this will be done by Installation contractors. This will give us a result in whether the change of the Carbon Filters should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers. We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The carbon filter/pre-filters and system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.

Odour counteract ant or neutralising system (where applied):N/A

Cooker hood:

Dimensions of hood : 6.5 x 1300 x 400 / 600

The canopy will be manufactured from stainless steel grade 304, with a 400mm front and 600mm back design. The canopy hood will be supplied with 495*495*45 stainless steel baffle filters, with grease drain off taps on each end of the extraction hood.

Face velocity hood	= 8.45m/s
Design volume	= 4.31m ³ /sec

Total number of grease filters 13 / Dimensions 495*495*45
Design Volume 4.31m³/s / 13 = 0.33m³/s

13 off stainless steel baffle filters

System operation:

Duct Work and Discharge Efflux Velocity for Hood

The duct work will spigot off the top of the 4.5mtr hood, the extract duct will then continue up to the carbon filtration section and plant (i.e. the extraction plant), which will run horizontally against the kitchen ceiling internal of the building before exiting the building to connect onto the external vertical discharge flue which will be 1mtr above the eaves of the building, discharging via High Velocity Discharge Cowl.

The extract hood will have a clearance of 2mtr to the front underside, the will plant section consists of a carbon filtration unit before the extractor fan which will be united to an attenuator with anti-vibration mounts and Dura-dyne connections which will help nullify any further transmitting noise and vibrations, the extractor fan will be speed controlled via auto-transformer regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers, the plant will have accessible points for service and maintenance.

The plant system which will all be suspended using M10 Rod hangers and Heavy duty 20*41 uni struct support bars where required before going up to the vertical discharge flue which will only appear external of the building.

The vertical discharge flue will be of a high Velocity Discharge cowl which will be set 1mtr above the eaves of the building, the wall mounted duct support brackets for the vertical riser will be hard fixed and isolated with Anti-Vibration-Mounts (AVM). The High Velocity Cowl is ideal for good dispersion of fumes.

For aesthetic purposes the exposed vertical discharge flue can be painted to suit exterior of building colour to soften image of the gray steel finish of all general ducts (to be approved by Authority please see below two selection of RAL colour codes which can be checked via websites on RAL colours with code given for selection. (brick red / Terracotta Ral code: 3009 / matt black slate Ral code:9005 / Graphite grey Ral code:7024)

The duct work size is approximately 730*730 or equivalent and at the discharge point will be 560 dia

$.73 \times .73 = 0.53\text{m}^2$ (air across duct section)

$4.31\text{m}^3/\text{s} / 0.53 = 8.13\text{m}/\text{second}$ (air speed in duct)

The efflux velocity is **17.49m/second** and the duct work will be free from grease disperse all fumes to high level.

($4.31\text{m}^3/\text{s} / 0.2463\text{m}^3$ (free area inside 560 dia duct or equivalent) = **17.49m/s velocity**)

Duct Dimensions of extraction system & flue

The duct work size is approximately 730*730 or equivalent and at the discharge point will be 560 dia

$.73 \times .73 = 0.53\text{m}^2$ (air across duct section)

$4.31\text{m}^3/\text{s} / 0.53 = 8.13\text{m}/\text{second}$ (air speed in duct)

The efflux velocity is **17.49m/second** and the duct work will be free from grease disperse all fumes to high level.

($4.31\text{m}^3/\text{s} / 0.2463\text{m}^3$ (free area inside 560 dia duct or equivalent) = **17.49m/s velocity**)

Extractor Fan Specification

Fan selected: SLC560/2-3 REVOLUTION LONG CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Extract fan will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

This fan runs at 2920rpms with a maximum operating noise of 75dBA and will handle air flow rate in excess of 5.264m³/sec @ 597pa.

Flue design:

The vertical discharge flue is a 730 dia or equivalent and 560 dia at the High Velocity Discharge Cowl point , the High Velocity Discharge Cowl will be above 1mtr above eves level of building (please see plans and drawing section for this view)

Noise:

PLEASE SEE ACCOUSTIC DETAILS PROVIDED BY ACOUSTIC CONSULTANT

Maintenance:

The carbon cells should be inspected for carbon testing every 3 months for results in changing, again this will be done by Installation contractors. This will give us a result in whether the change of the Carbon Filters should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers. We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The carbon filter/pre-filters and system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.

Additional notes for guidance:

KITCHEN FRESH AIR-INLET DETAILS:

Design Volume: $4.31\text{m}^3/\text{s}$ (canopy hood design volume) $\times 3600 = 15,516\text{m}^3/\text{hr}$

Kitchen area $5.4\text{m} \times 7.9\text{m} \times 2.4\text{m} = 102.38\text{m}^3$ recommended air change rate for commercial kitchen is 60 ach

The air change rate equates to $15,516\text{m}^3/\text{hr}$ divided by the room volume 102.38m^3
This gives us an air change rate of 151.55ach. Minimum for commercial kitchen 30-60 ach, this figure can be brought down using the speed regulator.

Supply Volume Design:

With such a high air change the design would call for the maximum recommended replacement of 85%

This would be $4.31\text{m}^3/\text{s}$ ($15,516\text{m}^3/\text{hr}$) $\times 85\%$ requires $3.66\text{m}^3/\text{s}$ ($13,176\text{m}^3/\text{hr}$)

Pressure Lost in Air- Supply System

Allowing for 45 pa filter / (600*600 duct = $7.03\text{m}/\text{s}$ velocity) 100 pa duct / 80 pa grille / bends 30 / = **255pa clean / 300 pa dirty**

Required duty and pressure: $3.66\text{m}^3/\text{s}$ @ 300 pa

Air-Supply Fan and Grill Specification

Fan selected: SLC500/2-3 REVOLUTION LONG CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Extract fan will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

This fan runs at 2935rpms with a maximum operating noise of 71dBA and will handle air flow rate in excess of $4.244\text{m}^3/\text{sec}$ @ 403pa.

Annex C: Risk Assessment for Odour

Odour control must be designed to prevent odour nuisance in a given situation. The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach. The odour control requirements considered here are consistent with the performance requirements listed in this report.

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

* based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type:

Criteria	Score	Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10 m/s.
	Moderate	10	Discharging 1m above eaves at 10 -15 m/s.
	Good	5	Discharging 1m above ridge at 15 m/s.
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge.
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge.
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge.
Size of kitchen	Large	5	More than 100 covers or large sized take away.
	Medium	3	Between 30 and 100 covers or medium sized take away.
	Small	1	Less than 30 covers or small take away.
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips.
	High	7	Kebab, Vietnamese, Thai or Indian.
	Medium	4	Cantonese, Japanese or Chinese.
	Low	1	Most pubs, Italian, French, Pizza or steakhouse.