

POWERED VENTILATION LTD.

Kitchen Extract system Solutions

www.poweredventilation.co.uk

SPECIFICATION ON EXTRACTION SYSTEM:

SITE REF:

171 CAVERSHAM ROAD,
READING,
RG1 8BB

APPLICATION REF: 190842/FUL

Canopy Hoods Details

Dimensions of hood : 3000 x 1400 x 400 / 500

The canopy will be manufactured from stainless steel grade 304, with a 400mm front and 500mm 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	= 4.20m/s
Design volume	= 2.14m ³ /sec

Total number of grease filters 6 / Dimensions 495*495*45

Design Volume 2.14m³/s / 6 = 0.36m³/s

6 off stainless steel baffle filters

Duct Work and Discharge Efflux Velocity for Hood

The duct work will spigot off the top of the 3.0mtr hood, the extract duct will then continue up to the plant section which will run horizontally against the kitchen ceiling internal of the building before going up to the vertical discharge flue above eaves which will appear externally with its Acoustic silencer and acoustic jacket enclosed extract fan.

The extract hood will have a clearance of 2mtr to the front underside, the plant section will consist of a 3 stage filtration system after the extract hood grease baffle filters, the system will comprise of a ESP Unit / UV Treatment and Carbon filtration (please see details by **Extechnology**) 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 vertical discharge flue will be of a high Velocity Discharge cowl which will be set 1mtr above the eaves. The High Velocity Cowl is ideal for good dispersion of fumes.

The duct work size is approximately 500*500 or equivalent and at the discharge point will be 400 dia

$$.5 \times .5 = 0.25\text{m}^2 \text{ (air across duct section)}$$

$$2.14\text{m}^3/\text{s} / 0.25 = 8.56\text{m}/\text{second} \text{ (air speed in duct)}$$

The efflux velocity is **17.03m/second** and the duct work will be free from grease disperse all fumes to high level.

$$(2.14\text{m}^3/\text{s} / 0.12566\text{m}^2) \text{ (free area inside 400 dia duct or equivalent) } = \mathbf{17.03\text{m/s velocity}}$$

Pressure Lost in System

14 off, Linear Metres duct@	2.5 pa =	35pa
6 off, Stainless Baffle Filters	=	85pa
1off, High Efficiency cowl + Bends	=	70pa
1off, Carbon unit and pre-filter	=	150pa
1off, Esp/Uv Unit	=	100pa
Total	=	440pa clean / 500 pa dirty

Required duty and pressure: 2.14m³/s @ 440 pa

Extractor Fan Specification

Located within the duct work is a S&P CVAT/4-12000/560N D 2.2 ACCOUSTIC ENCLOSED EXTRACTER FAN, 4 pole, 3 phase, speed control via Transformer /Inverter regulator.

This fan runs at 1470rpms with a maximum operating noise of 71dBA and will handle air flow rate in excess of 2.224m³/sec @ 500pa.

Silencer Details:

PLEASE SEE ACCOUSTIC DETAILS PROVIDED BY RANDTECH CONSULTANTS

Odour Control Details: (CARBON 3rd STAGE FILTRATION) / (SEE SEPARATE SPEC SHEET FOR ESP & UV AND CARBON DETAILS BY EXTECHNOLOGY)

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 21 carbon discarb cells.

For 0.3 seconds contact time- Typically recommended for Spicy cuisine such as Thai / Indian / Grill & Steakhouse.

1 Carbon cell volume: 0.33m³ @ 0.1s dwell

3 Carbon cells volume: 1 m³/s @ 0.1s dwell

So therefore @ 2.14m³/s = 7 Carbon cells @ 0.1s dwell for 0.3s dwell $7 \times 3 = 21$ Carbon cell required.

Therefore a minimum of 21 Extra Duty carbon cells must be used.

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.

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/J3997a

8th July 2019

Powered Ventilation Ltd

Alexander House

60 Tenby Street North

Birmingham

B1 3EG

Dear Sirs

Re: 171 Caversham Road, Reading, RG1 8BB – Proposed Kitchen Ventilation Systems External Noise Assessment

Further to the receipt of your ventilation system design information, we are pleased to forward our external noise assessment for the proposed kitchen ventilation systems based on a site background noise measurement as follows:-

We visited site on 3/7/19 and measured the background noise level from midnight for a period of 60 minutes in the rear yard of the building, close to the proposed extract ventilation system location. The background noise level recorded was of 45.0dB LA90, measured in good weather condition and this represents the background noise level outside the nearest residential windows at the rear of the site. At the front of the site, the noise impacting 1st floor residential windows would be primarily passing road traffic noise, taken to be 50.0dB LA90. The nearest residential windows are approximately 2m distance from the proposed kitchen fresh air supply inlet and 3m distance from the kitchen extract discharge above roof eaves level. The proposed late-night operating times extend to 1.00am (Friday & Saturday).

We advise a design criterion for the ventilation fresh air inlet and extract discharge should be at least 10dBA below the prevailing background noise level at the nearest residential windows.



Ref: MDR/J3997a

The instrumentation used for the measurement was a Rion NL-52 precision grade real time analysing sound level meter, serial number 00610205. The instrument was calibration checked before and after the measurement and seen to be calibrated correctly. Please see the attached copy of the current calibration certificate for the instrument.

We have selected a silencer for the extract discharge system, the silencer would be a 33% free area splitter silencer, typically 600mm wide x 900mm high x 1800mm long. The silencer should reduce the radiated discharge noise to 34dBA at 3m distance.

We have selected a silencer for the fresh air supply inlet, the silencer would be a cylindrical podded silencer, typically 400mm i/d x 550mm o/d x 1200mm long. The silencer should reduce the radiated inlet noise to 39dBA at 2m.

We advise fitting a silencer to the inlet side of the kitchen extract fan to reduce noise within the kitchen area; the silencer advised is a cylindrical podded silencer typically 400mm i/d x 550mm o/d x 400mm long. We advise fitting a silencer to the discharge side of the fresh air supply fan; the silencer advised is a cylindrical podded silencer typically 400mm i/d x 550mm o/d x 400mm long.

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

In addition, the extract fan casing and external extract ductwork up to the start of the discharge silencer should be fitted with an acoustic enclosure to minimised fan break-out noise. The acoustic enclosure should be free-standing, mounted off the flat roof and should be constructed from 50mm thick acoustic panels with an outer skin of 1.2mm galvanised mild steel and an acoustic lining of 50mm mineral wool retained by galvanised mild steel perforate.

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



Ref: MDR/J3997a

Please note that on the adjoining property there is an existing kitchen extract ventilation system close to residential windows that has no fan discharge silencing and a discharge cowl that prevents any efficient high velocity vertical discharge of extract ventilation air; clearly inconsistent with normal environmental control standards. Also, nearby within the terrace of commercial/residential buildings there were two more kitchen extract ventilation systems clearly visible that had no silencing and no vertical discharge capability.

We trust the design information 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



0653

Date of Issue: 05 October 2018

Certificate Number: UCRT18/2022

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.ukWeb: 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	00610205
	Rion	Firmware		1.9
	Rion	Pre Amplifier	NH-25	10199
	Rion	Microphone	UC-59	02547
	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 04 October 2018

ANV Job No. UKAS18/10630

Date Calibrated 05 October 2018

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
	20 November 2017	UCRT17/2046	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

UCRT18/2022

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	03 October 2018	
Calibrator cert. number	UCRT18/2010	
Calibrator cal cert issued by	0653	
Calibrator SPL @ STP	94.01	dB Calibration reference sound pressure level
Calibrator frequency	1001.98	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	23.90	23.70	± 0.40 °C
Humidity	47.6	47.2	± 3.00 %RH
Ambient Pressure	100.37	100.33	± 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
	12.4	16.4	21.9
	dB UR	dB UR	dB UR

Uncertainty of the electrical self generated noise ± 0.12 dB

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

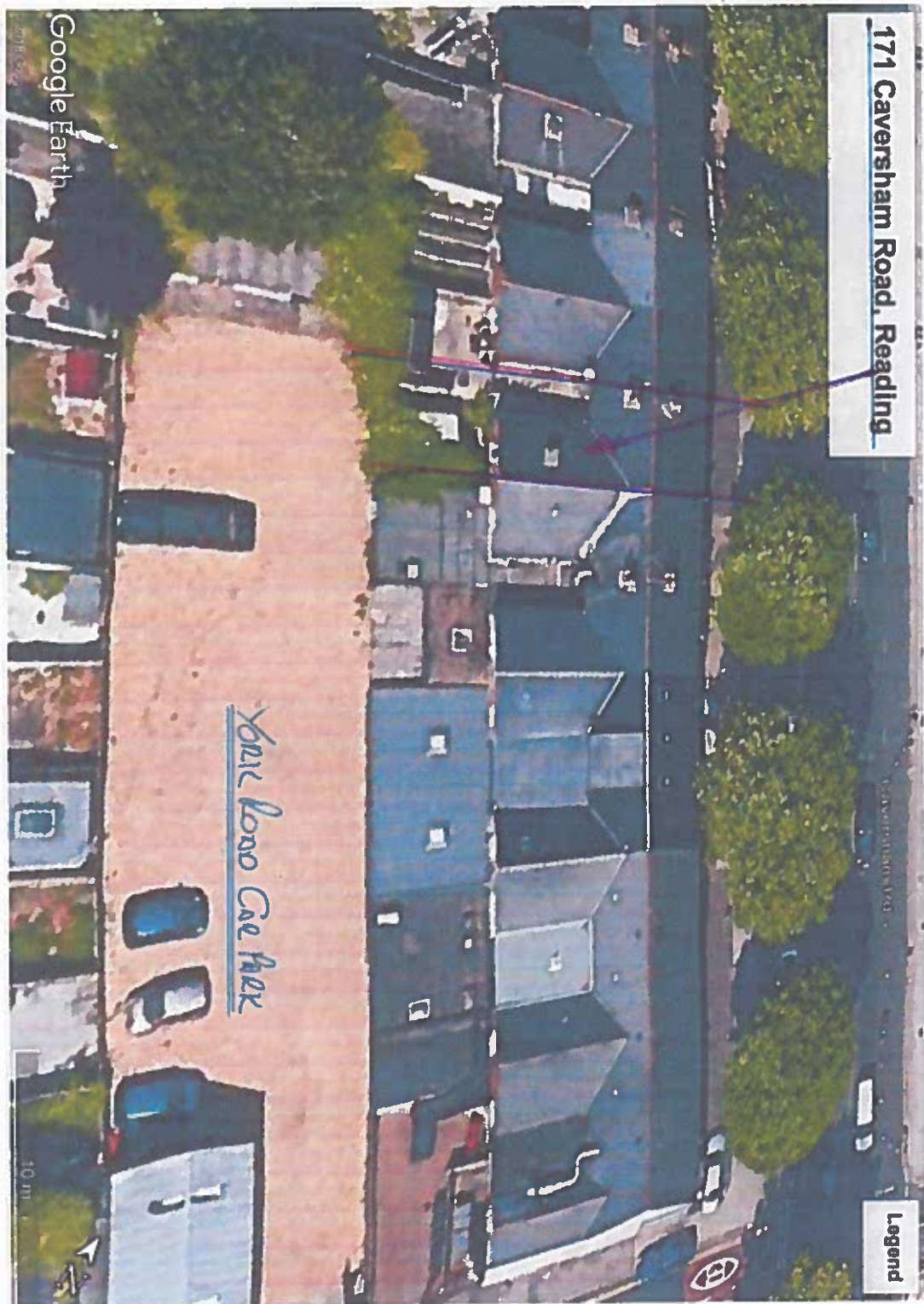
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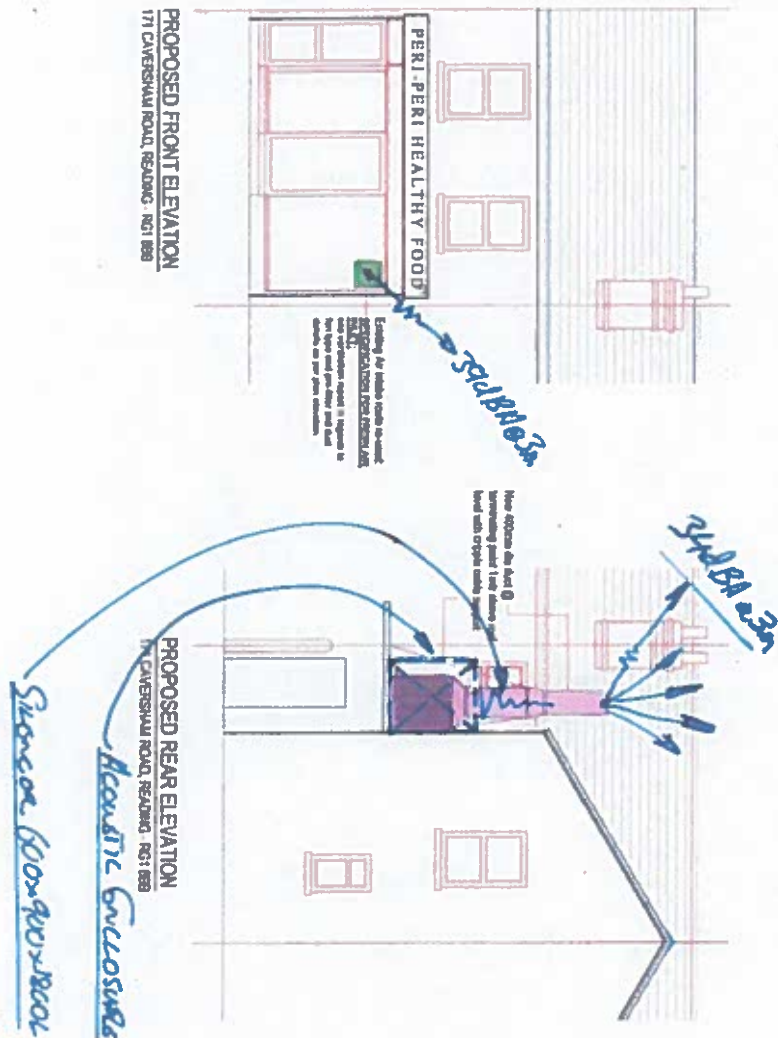
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Additional Comments

None







Client: 171 CAVERSHAM RD, READING, RG1 8BB
Project: REAR ELEVATION & FRONT FOR EXTRACT & AIR-INLET
Scale: 1/100
Drawing no.: 1
Job no.: N/A
NOTES:
Council ref: 190842/FUL
Officer: N/A
Date: 27/06/19
Drawn: M J ALI

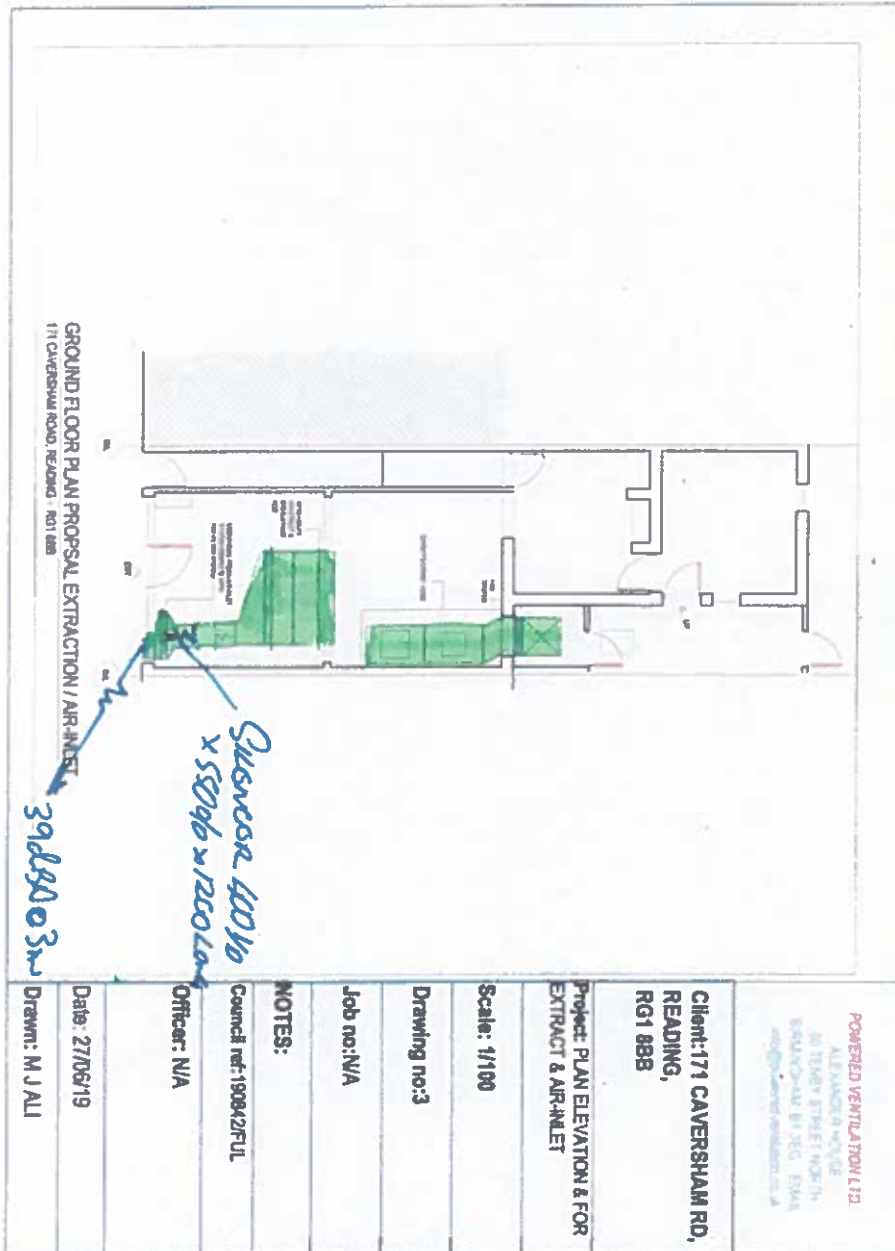
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POWERED VENTILATION LTD. ALFORDS WOLD 91 TOWN STREET NORTH BROOKHAMPTON ST. SEC. CLAY WILTON WILTON WILTON		Client: 171 CAVERSHAM RD, READING, RG1 8BB	
Project: SIDE ELEVATION FOR EXTRACT PLANT DISCHARGE		Scale: 1/100	
Drawing no: 2		Job no: N/A	
NOTES:		Council ref: 190842/UL	
Officer: N/A		Date: 27/06/19	
Drawn: M J ALL		Proposed Side Elevation 171 CAVERSHAM ROAD, READING - RG1 8BB	

Gravel 600x900
1800L
Acoustic Enclosures

Res: 1908/1999



Rev: 1002/3397



171 CAUGRETHAM KENNEDY READING - KITCHEN BURNING DISCHARGE NOTES

Ref: ~~1000~~ / J3997



171 COLUMBIA ROAD, Reading - KROHN SUPPLY INTAKES

Lot: 1102/3997



Design Sheet (3)

171 Coughston Road, Reading - Kitchen Extract Fan Break-out

	L/A	63	125	250	500	1k	2k	4k	8k
Extract Fan S+P CURT/4-120									
2.1km/10.4k/1A SWLA		44	64	67	63	61	58	51	44
SWLA → SPL _A @ 3m		20	20	20	20	20	20	20	20
SPL _A @ 3m		24	44	47	43	41	38	31	24
			44	48		43		32	
				49			43		
						50dB			
Acoustic Enclosure Reading									
1.2km GAIN @ MILD Steel		8	13	20	24	28	33	39	45
		16	31	27	19	12	5	0	0
			31		28		13		0
				33			13		
* Silencer SPL _A @ 3m						33dB			*

Ref: M02/JSP17



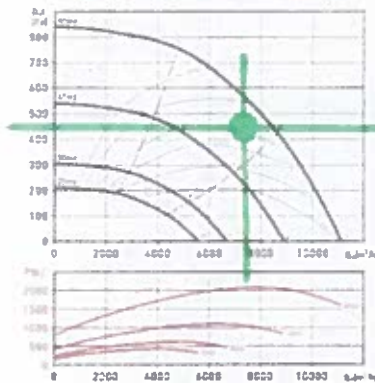
ACOUSTIC CABINET FANS CVAB-N / CVAT-N Series



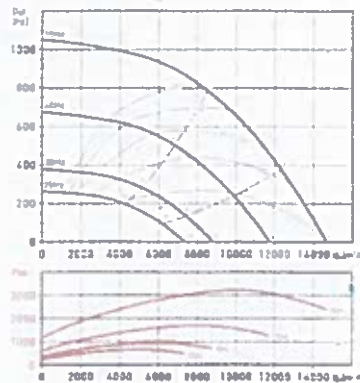
PERFORMANCE CURVES - ACOUSTIC CHARACTERISTICS

- q : Airflow in m^3/h .
- p_s : Static pressure in Pa.
- P : Input power in W.
- SFP: Specific fan power in $W/m^3/s$ (blue curves).
- Performance data in accordance with ISO 5801 and AMCA 210-99 Standards.

CVAT/4-12000/630N D 2.5kW



CVAT/4-16000/630N D 3kW



Working point	63	125	250	500	1000	2000	4000	8000	LWA
1 Inlet	55	77	79	78	76	81	72	66	84
1 Outlet	63	78	78	81	81	79	71	63	87
1 Break-Out	49	64	67	64	62	63	53	46	72
1 Inlet	51	76	78	77	76	75	69	64	84
2 Inlet	48	74	80	77	81	73	67	60	85
2 Break-Out	46	64	67	63	61	58	51	44	71
2 Inlet	54	73	76	74	73	72	67	63	81
3 Inlet	40	74	74	78	74	70	64	58	81
3 Break-Out	31	65	66	61	60	55	49	43	70
3 Inlet	50	72	74	73	71	76	67	61	81
4 Inlet	50	72	73	76	74	74	66	55	82
4 Break-Out	44	60	63	59	58	59	49	41	67
4 Inlet	46	71	73	72	71	70	64	59	79
5 Inlet	56	71	75	72	74	68	62	55	81
5 Break-Out	41	59	62	58	57	53	44	39	66
5 Inlet	51	70	71	69	68	67	62	56	77
6 Inlet	55	69	69	73	69	65	59	53	77
6 Break-Out	44	60	61	56	55	50	43	39	65
6 Inlet	44	66	68	67	65	70	61	55	75
7 Inlet	52	67	67	69	70	67	60	49	74
7 Break-Out	38	53	56	52	51	52	42	35	61
7 Inlet	39	65	67	64	64	64	57	52	73
8 Inlet	49	65	69	66	70	62	56	49	74
8 Break-Out	34	53	56	52	50	47	40	33	60
8 Inlet	45	64	65	63	62	61	54	52	70
9 Inlet	49	63	62	66	62	59	53	47	70
9 Break-Out	40	53	55	49	49	44	38	32	59
9 Inlet	40	62	64	63	61	66	57	51	71
10 Inlet	48	63	63	65	66	63	56	45	72
10 Break-Out	34	49	52	49	47	48	38	31	57
10 Inlet	36	61	63	62	61	60	53	46	69
11 Inlet	45	61	65	62	66	58	52	45	70
11 Break-Out	31	49	52	48	46	43	36	29	56
11 Inlet	41	62	61	59	58	57	52	46	64
12 Inlet	43	59	59	62	59	55	49	42	64
12 Break-Out	36	49	51	45	43	40	34	28	55

Working point	63	125	250	500	1000	2000	4000	8000	LWA
1 Inlet	57	79	81	83	78	84	74	66	88
1 Outlet	67	82	81	84	84	81	74	62	90
1 Break-Out	52	67	70	65	64	66	56	48	74
1 Inlet	53	79	82	80	78	78	71	64	87
2 Inlet	64	81	84	81	85	76	70	64	89
2 Break-Out	48	68	71	66	64	60	53	47	74
2 Inlet	61	81	81	78	78	77	71	68	87
3 Inlet	66	81	79	84	79	75	69	64	88
3 Break-Out	56	70	71	65	64	59	54	48	75
3 Inlet	53	75	77	75	74	79	69	63	83
4 Inlet	62	77	76	79	79	76	69	57	85
4 Break-Out	47	62	66	61	59	61	51	43	69
4 Inlet	48	75	77	75	74	74	66	61	82
5 Inlet	60	76	79	76	80	72	65	59	84
5 Break-Out	43	63	66	61	59	55	48	42	69
5 Inlet	56	74	77	74	73	72	67	62	82
6 Inlet	61	74	74	79	72	71	64	59	83
6 Break-Out	52	65	67	60	59	54	49	44	70
6 Inlet	44	68	70	69	67	73	63	57	77
7 Inlet	56	70	70	73	73	70	63	51	78
7 Break-Out	41	56	59	54	53	55	45	37	63
7 Inlet	42	68	71	69	67	67	60	55	76
8 Inlet	53	69	73	69	74	65	59	53	78
8 Break-Out	37	57	60	54	53	49	42	36	63
8 Inlet	50	70	70	67	67	64	60	57	76
9 Inlet	53	70	68	72	68	64	58	53	74
9 Break-Out	45	59	60	53	53	48	43	37	64
9 Inlet	42	64	64	65	63	69	59	53	73
10 Inlet	52	67	66	69	69	66	59	47	74
10 Break-Out	37	52	55	50	49	51	41	35	59
10 Inlet	38	64	67	65	63	62	56	51	72
11 Inlet	49	65	69	65	70	61	55	49	74
11 Break-Out	33	53	56	50	49	45	38	32	59
11 Inlet	44	66	64	63	63	62	56	53	72
12 Inlet	51	66	64	67	64	60	54	49	72
12 Break-Out	41	55	56	49	49	44	39	33	60

Ref: MDR/13317



ELTA FANS LTD (BUILDING SERVICES)

a member of the Elta Group

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46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

ELTA FAN DATA FOR MODEL SLC400/2-1

Location: 171 CAVERSHAM R Designation: AIR-SUPPLY

Fan Code: SLC400/2-1

Requirements

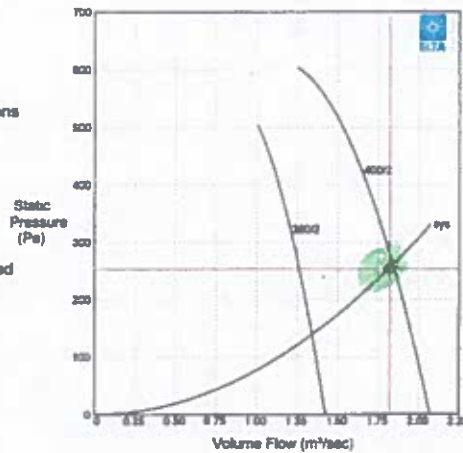
Volume: 1.82 m³/s
Static Pressure: 255 Pa
Selection Pressure: 255 Pa at std conditions
Operating Duty: 1.84 m³/s at 281 Pa
Temperature: 20 deg C
Altitude: 0 m

Fan Data (at STP)

Type: Revolution Long Cased Axial Fan
Diameter: 400 mm
Speed: 2780 RPM
Weight: 27 kg

Motor Data (at STP)

Motor Power: 1.5 kW
Electrical Supply: 240V@50Hz
Motor Speed Poles: 2 Poles



SOUND DATA

Spectrum (Hz)	63	125	250	500	1K	2K	4K	8K	dBA @ 3m
Sound Power (dB)	85	83	82	80	80	79	78	69	66

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

© 2001 Elta Fans

Ref: MOD/J3997

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

**Client: 171 CAVERSHAM RD,
 READING,
 RG1 8BB**

**Project: REAR ELEVATION &
 FRONT FOR EXTRACT &
 AIR-INLET**

Scale: 1/100

Drawing no: 1

Job no: N/A

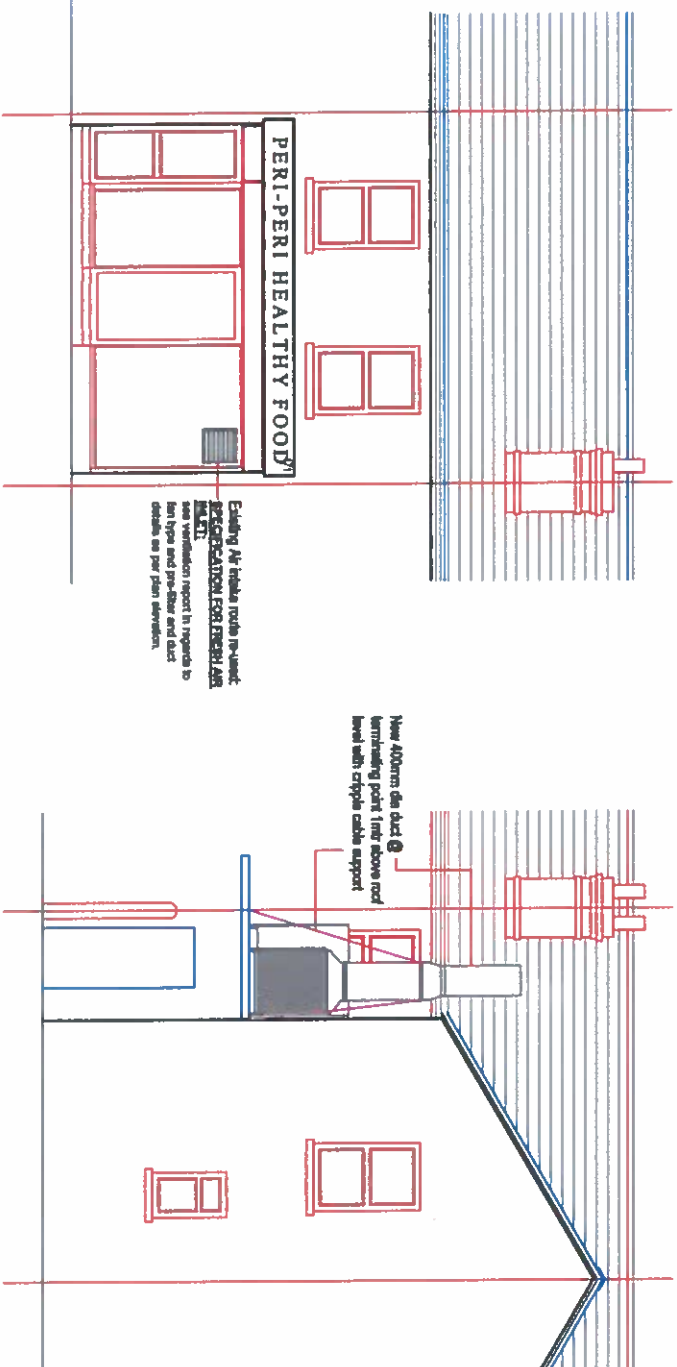
NOTES:

Council ref: 190842/FUL

Officer: N/A

Date: 27/06/19

Drawn: M J ALI



PROPOSED FRONT ELEVATION
 171 CAVERSHAM ROAD, READING - RG1 8BB

PROPOSED REAR ELEVATION
 171 CAVERSHAM ROAD, READING - RG1 8BB

POWERED VENTILATION LTD.
 ALEXANDER HOUSE,
 60 TENBY STREET NORTH,
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info@poweredventilation.co.uk

**Client: 171 CAVERSHAM RD,
 READING,
 RG1 8BB**

**Project: SIDE ELEVATION FOR
 EXTRACT PLANT & DISCHARGE**

Scale: 1/100

Drawing no: 2

Job no: N/A

NOTES:

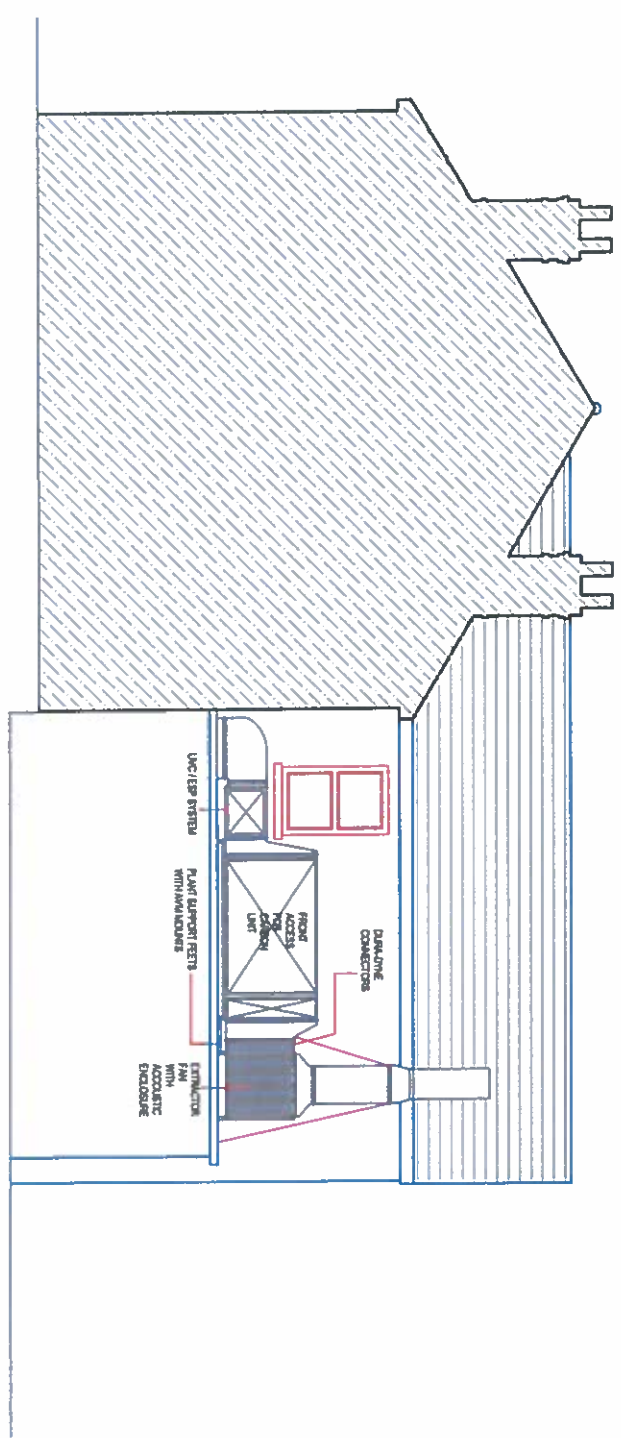
Council ref: 190842/FUL

Officer: N/A

Date: 27/06/19

Drawn: M J ALI

PROPOSED SIDE ELEVATION
 171 CAVERSHAM ROAD, READING - RG1 8BB



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

**Client:171 CAVERSHAM RD,
READING,
RG1 8BB**

**Project: PLAN ELEVATION & FOR
EXTRACT & AIR-INLET**

Scale: 1/100

Drawing no:3

Job no:N/A

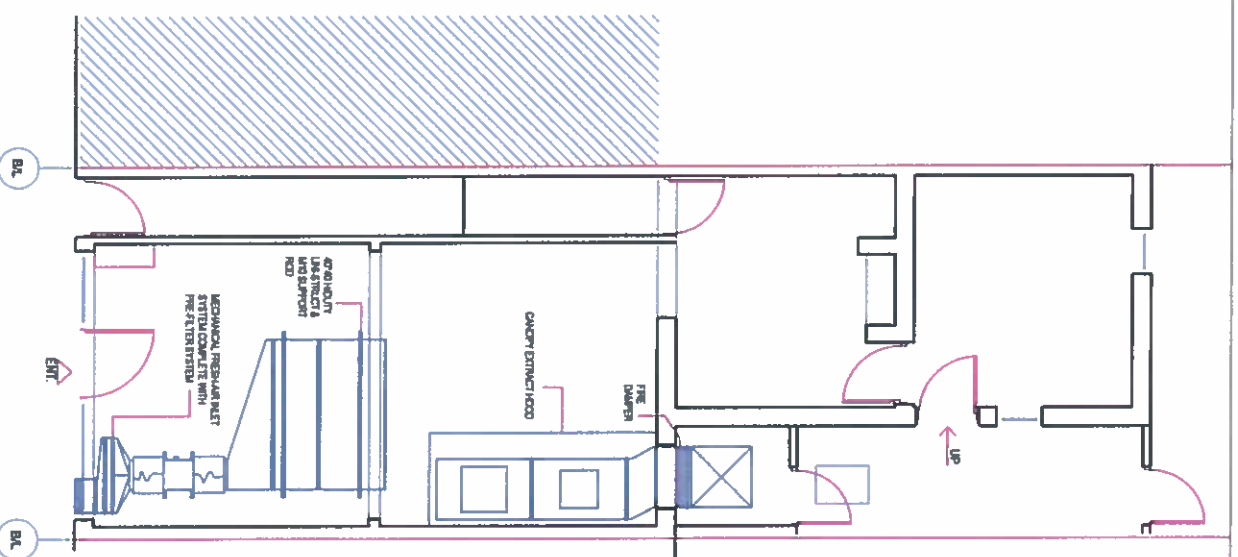
NOTES:

Council ref:190842/FUL

Officer: N/A

Date: 27/06/19

Drawn: M J ALI



GROUND FLOOR PLAN PROPOSAL EXTRACTION / AIR-INLET
171 CAVERSHAM ROAD, READING - RG1 8BB



Range of direct drive backward curved centrifugal cabinet fans designed for ventilation of commercial kitchens and industrial applications.

Cabinet fan manufactured from aluminium profiles and double thickness side panels internally lined with 25 mm thickness of fireproof fiberglass acoustic insulation.

Circular duct connection flange on the inlet and outlet. CVAB-N/CVAT-N incorporates direct drive backward curved centrifugal impeller, manufactured from aluminium (CVAB-N) or steel (CVAT-N) sheet, with motor fitted inside the air stream.

Motors

CVAB-N

Single-phase external rotor motors 230V 50Hz, IP55, class F, with thermal protection, speed controllable by tension. Working temperature from -40°C to 60°C.

CVAT-N

Three-phase 4 and 6 pole motors 230/400V 50Hz, IP55, class F, with thermal protection (PTC), speed controllable by inverter. Working temperature from -20°C to 40°C.

ATEX versions

On request, explosion proof versions in accordance to ATEX Directive, for three phase models.

Working temperature from -20°C to +40°C.

- ATEX Flameproof - Gas

⊕ II 2G Exd IIB T4

⊕ II 2G Exd IIB(H2) T4 (with motor Exd IIC T4)

- ATEX Increased safety - Gas

⊕ II 2G Exe IIC T3

To select CVAT-N ATEX refer to performance curves, or Easyvent. Note electrical data may vary for ATEX motors.



Backward curved centrifugal Impellers

To prevent accumulation of dirtiness. Dynamically balanced.



Low noise level

Double thickness side panels lined with 25 mm thickness of fireproof fiberglass acoustic insulation.



Robustness

Quality finished aluminium profiles and plastic corners providing a great robustness.



Industrial
kitchens



Versions

ACOUSTIC CABINET FANS

CVAB-N / CVAT-N Series



TECHNICAL CHARACTERISTICS

Before installation check that the product electrical characteristics listed on the data plate label (voltage, power, frequency, etc.) match those of the intended electrical supply.

Model	Speed (rpm)	Maximum absorbed power (W)	Maximum absorbed current (A)	Maximum airflow (m³/h)	Sound pressure level* (dB(A))			Weight (kg)
					Inlet	Radiated	Outlet	
SINGLE-PHASE 4 POLES								
CVAB/4-1400/250N D	1300	107	0,5	1280	49	44	50	13,0
CVAB/4-2000/315N D	1390	169	0,7	1820	53	47	54	13,0
CVAB/4-3000/355N D	1370	312	1,3	2800	58	51	58	30,0
CVAB/4-4000/400N D	1390	557	2,3	4210	62	54	60	32,0
CVAB/4-6000/450N D	1380	930	4,0	6140	64	57	63	46,0
CVAB/4-9000/500N D	1390	1289	5,5	7580	68	61	66	58,0
THREE-PHASE 4 POLES								
CVAT/4-1400/250N D 0,18	1480	116	0,5	1.230	50	37	48	13,0
CVAT/4-2000/315N D 0,18	1460	169	0,5	1.830	54	41	53	13,0
CVAT/4-3000/355N D 0,18	1430	251	0,5	2.660	56	43	56	30,0
CVAT/4-4000/400N D 0,37	1445	438	0,9	3.850	60	47	60	32,0
CVAT/4-6000/450N D 0,75	1465	747	1,7	5.620	63	50	64	46,0
CVAT/4-9000/500N D 1,1	1480	1347	2,5	7.900	67	53	68	58,0
CVAT/4-12000/560N D 2,2	1470	2093	4,2	11.100	69	56	71	82,0
CVAT/4-16000/630N D 3	1460	3234	5,9	14.640	72	60	75	113,0
THREE-PHASE 6 POLES								
CVAT/6-15000/710N D 1,5	970	1828	3,6	14.320	72	60	74	149,0

* Sound pressure level measured in free field condition at 1.5m, at the medium working point on the performance curve, shown 2, 5, 8 and 11.

Model	VFTM		VFKB	
	1-PHASE SUPPLY	3-PHASE SUPPLY	1-PHASE SUPPLY	3-PHASE SUPPLY
CVAT/4-1400/250N D 0,18	VFTM MONO 0,18		VFKB-24	VFKB-45
CVAT/4-2000/315N D 0,18	VFTM MONO 0,18		VFKB-24	VFKB-45
CVAT/4-3000/355N D 0,18	VFTM MONO 0,18		VFKB-24	VFKB-45
CVAT/4-4000/400N D 0,37	VFTM MONO 0,18	VFTM TRI 0,37	VFKB-24	VFKB-45
CVAT/4-6000/450N D 0,75	VFTM MONO 0,37	VFTM TRI 0,75	VFKB-24	VFKB-45
CVAT/4-9000/500N D 1,1	VFTM MONO 0,37	VFTM TRI 1,1	VFKB-24	VFKB-45
CVAT/4-12000/560N D 2,2	VFTM MONO 0,75	VFTM TRI 2,2	VFKB-27	VFKB-48
CVAT/4-16000/630N D 3	VFTM MONO 1,1	VFTM TRI 3	VFKB-27	VFKB-48
CVAT/6-15000/710N D 1,5	VFTM MONO 0,55	VFTM TRI 1,5	VFKB-27	VFKB-48

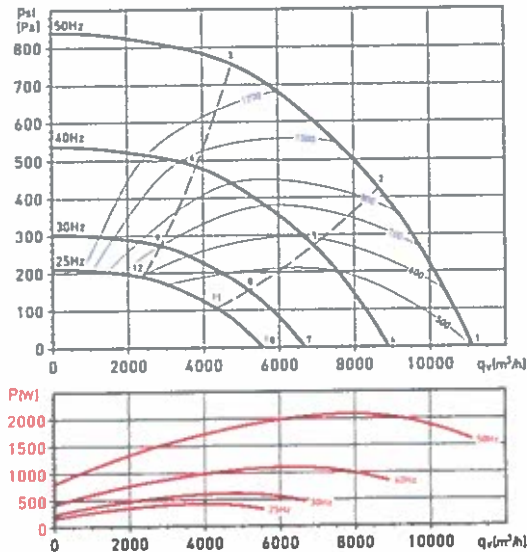
ACOUSTIC CABINET FANS CVAB-N / CVAT-N Series



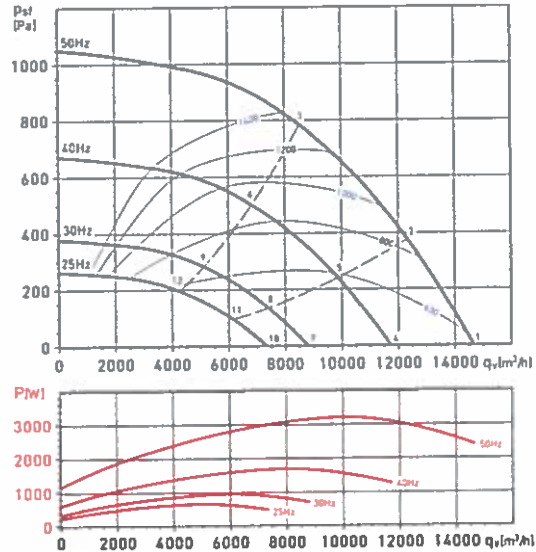
PERFORMANCE CURVES - ACOUSTIC CHARACTERISTICS

- q_v : Airflow in m^3/h .
- p_{st} : Static pressure in Pa.
- P: Input power in W.
- SFP: Specific fan power in $W/m^3/s$ (blue curves).
- Performance data in accordance with ISO 5801 and AMCA 210-99 Standards.

CVAT/4-12000/560N D 2,2kW



CVAT/4-16000/630N D 3kW



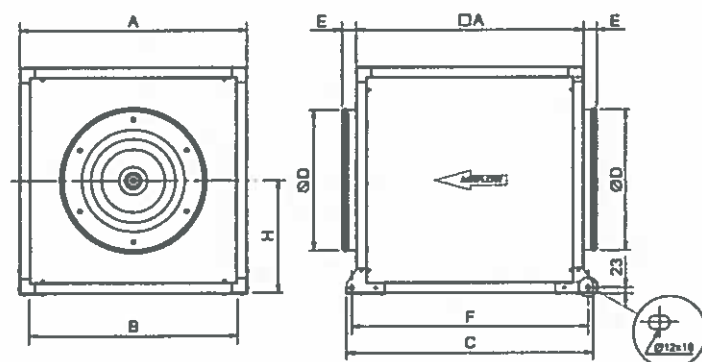
Working point	63	125	250	500	1000	2000	4000	8000	LWA
1 Inlet	55	77	79	78	76	81	72	66	86
1 Outlet	63	78	78	81	81	78	71	60	87
1 Break-Out	49	64	67	64	62	63	53	46	72
2 Inlet	51	76	78	77	76	75	69	64	84
2 Outlet	60	76	80	77	81	73	67	60	85
2 Break-Out	46	64	67	63	61	58	51	44	71
3 Inlet	56	75	76	74	73	72	67	63	81
3 Outlet	60	74	74	78	74	70	64	58	81
3 Break-Out	51	65	66	61	60	55	49	43	70
4 Inlet	50	72	74	73	71	76	67	61	81
4 Outlet	58	73	73	76	76	74	66	55	82
4 Break-Out	44	60	63	59	58	59	49	41	67
5 Inlet	46	71	73	72	71	70	64	59	79
5 Outlet	55	71	75	72	76	68	62	55	81
5 Break-Out	41	59	62	58	57	53	46	39	66
6 Inlet	51	70	71	69	68	67	62	58	77
6 Outlet	55	69	69	73	69	65	59	53	77
6 Break-Out	46	60	61	56	55	50	45	39	65
7 Inlet	44	66	68	67	65	70	61	55	75
7 Outlet	52	67	67	69	70	67	60	49	76
7 Break-Out	38	53	56	52	51	52	42	35	61
8 Inlet	39	65	67	66	64	64	57	52	73
8 Outlet	49	65	69	66	70	62	56	49	74
8 Break-Out	34	53	56	52	50	47	40	33	60
9 Inlet	45	64	65	63	62	61	56	52	70
9 Outlet	49	63	62	66	62	59	53	47	70
9 Break-Out	40	53	55	49	49	44	38	32	59
10 Inlet	40	62	64	63	61	66	57	51	71
10 Outlet	48	63	63	65	66	63	56	45	72
10 Break-Out	34	49	52	49	47	48	38	31	57
11 Inlet	36	61	63	62	61	60	53	48	69
11 Outlet	45	61	65	62	66	58	52	45	70
11 Break-Out	31	49	52	48	46	43	36	29	56
12 Inlet	41	60	61	59	58	57	52	48	66
12 Outlet	45	59	59	62	59	55	49	43	66
12 Break-Out	36	49	51	45	45	40	34	28	55

Working point	63	125	250	500	1000	2000	4000	8000	LWA
1 Inlet	57	79	81	80	78	84	74	68	88
1 Outlet	67	82	81	84	84	81	74	62	90
1 Break-Out	52	67	70	65	64	66	56	48	74
2 Inlet	53	79	82	80	78	78	71	66	87
2 Outlet	64	81	84	81	85	76	70	64	89
2 Break-Out	48	68	71	66	64	60	53	47	74
3 Inlet	61	81	81	78	78	77	71	68	87
3 Outlet	66	81	79	84	79	75	69	64	88
3 Break-Out	56	70	71	65	64	59	54	48	75
4 Inlet	53	75	77	75	74	79	69	63	83
4 Outlet	62	77	76	79	79	76	69	57	85
4 Break-Out	47	62	66	61	59	61	51	43	69
5 Inlet	48	75	77	75	74	74	66	61	82
5 Outlet	60	76	79	76	80	72	65	59	84
5 Break-Out	43	63	66	61	59	55	48	42	69
6 Inlet	56	76	77	74	73	72	67	63	82
6 Outlet	61	76	74	79	74	71	64	59	83
6 Break-Out	52	65	67	60	59	54	49	44	70
7 Inlet	46	68	70	69	67	73	63	57	77
7 Outlet	56	70	70	73	73	70	63	51	78
7 Break-Out	41	56	59	54	53	55	45	37	63
8 Inlet	42	68	71	69	67	67	60	55	76
8 Outlet	53	69	73	69	74	65	59	53	78
8 Break-Out	37	57	60	54	53	49	42	36	63
9 Inlet	50	70	70	67	67	66	60	57	76
9 Outlet	55	70	68	72	68	64	58	53	76
9 Break-Out	45	59	60	53	53	48	43	37	64
10 Inlet	42	64	66	65	63	69	59	53	73
10 Outlet	52	67	66	69	69	66	59	47	74
10 Break-Out	37	52	55	50	49	51	41	33	59
11 Inlet	38	64	67	65	63	63	56	51	72
11 Outlet	49	65	69	65	70	61	55	49	74
11 Break-Out	33	53	56	50	49	45	38	32	59
12 Inlet	46	66	66	63	63	62	56	53	72
12 Outlet	51	66	64	69	64	60	54	49	72
12 Break-Out	41	55	56	49	49	44	39	33	60

ACOUSTIC CABINET FANS CVAB-N / CVAT-N Series



DIMENSIONS (mm)



Model CVAB - CVAT	A	B	C	D	E	F	H
1400/250N D	500	457	574	250	58	534	250
2000/315N D	500	457	574	315	58	534	250
3000/355N D	650	607	724	355	58	684	325
4000/400N D	650	607	724	400	58	684	325
6000/450N D	750	707	824	450	58	784	375
9000/500N D	800	757	874	500	58	834	400
12000/560N D	900	826	977	560	58	937	450
16000/630N D	1000	959	1077	630	58	1037	500
15000/710N D	1100	1059	1177	710	58	1137	550

MOUNTING ACCESSORIES



ACOPEL F400
Circular flexible
connector.



CTI CVA
Outdoor cover
For outdoor
installations.



KSE
Anti-vibration
mounts.

ELTA FANS LTD (BUILDING SERVICES)

a member of the Elta Group

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 SLC400/2-1

Location: 171 CAVERSHAM R Designation: AIR-SUPPLY

Fan Code: SLC400/2-1

Requirements

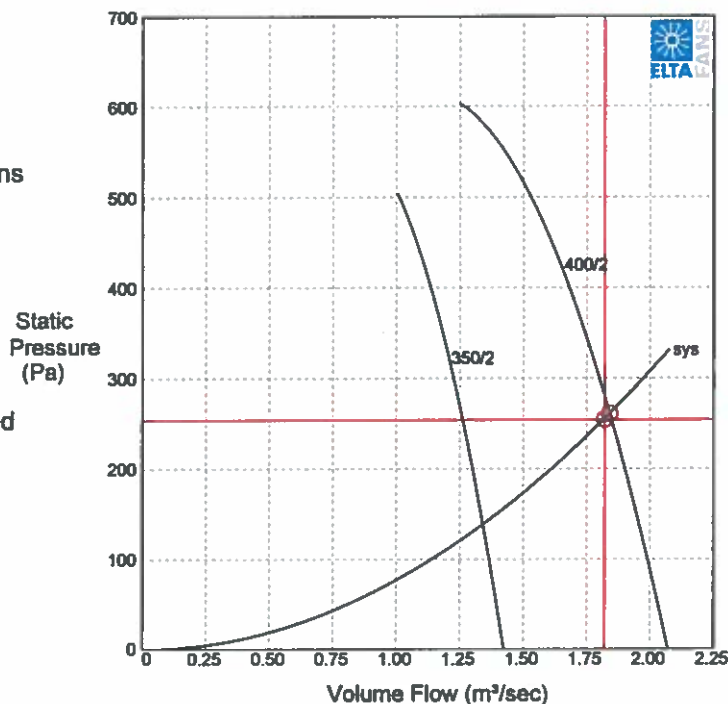
Volume: 1.82 m³/s
Static Pressure: 255 Pa
Selection Pressure: 255 Pa at std conditions
Operating Duty: 1.84 m³/s at 261 Pa
Temperature: 20 deg C
Altitude: 0 m

Fan Data (at STP)

Type: Revolution Long Cased Axial Fan
Diameter: 400 mm
Speed: 2780 RPM
Weight: 27 kg

Motor Data (at STP)

Motor Power: 1.5 kW
Electrical Supply: 240V@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)	85	83	82	86	80	79	76	69	66

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

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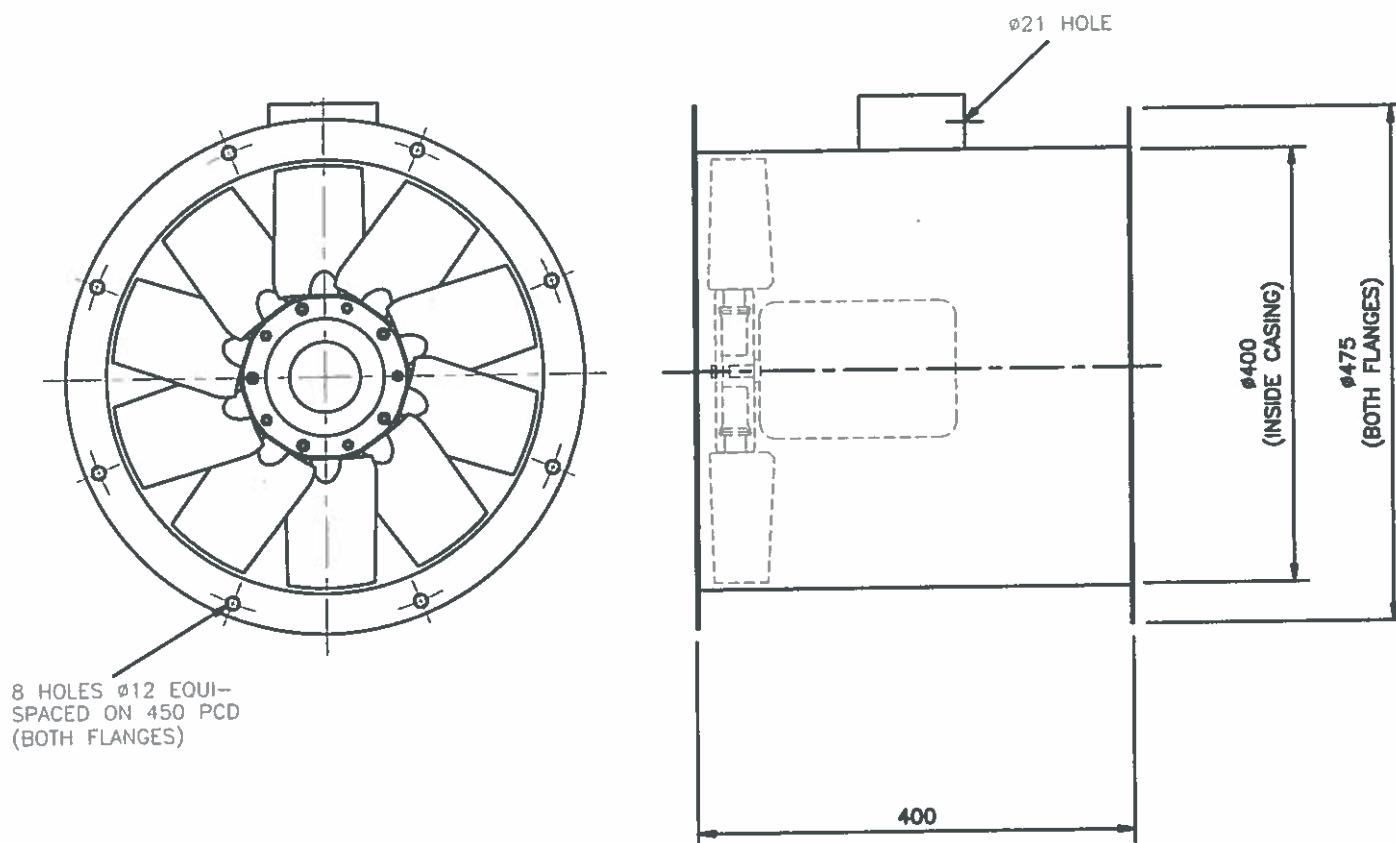
Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: mailbox@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK



DRAWING FOR MODEL SLC400/2-1

Location: 171 CAVERSHAM R Designation: AIR-SUPPLY

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



extechnology

The Next Generation in Odour Control Technology



Odour Control Equipment Quotation

Proposal For: Powered Ventilation

Site: Peri Chicken, Caversham Road
Reading, 190842/FUL

Prepared By: Daniel Clark

Prepared For: Mohammed

Document Date: 24/06/2019

Equipment Specification - 190842/FUL

<u>Type of Unit:</u>	RY7500B +UV
No of Units:	2
Size:	H 540 x W 1790 x D 620mm
Weight :	122 Kg
<u>Type of Unit:</u>	Carbon Housing (0.3s Dwell Time)
No of Units:	21N' Site Safe, G4 Pre Filters
Size:	H 1200 x W 2200 x D 900mm
Weight :	450 Kg

Describing the system

The Extechnology odour control application specified for 'Peri Chicken – Caversham Road, Reading' has been designed in line with DEFRA's 2005 guidance on the control of odour and noise from kitchen exhaust systems. Air Volume is 2.14 m³s.

The specification contained in this document is compliant with DEFRA guidelines and all agreements have been put in place to ensure that the system is maintained in accordance with the manufactures specification and the DEFRA guidance.

The specified system will comprise of four layers of filtration and should be considered above and beyond compliant with point two detailed on page 11 of DEFRA's guidance under the subheading "High Level of odour control":

Stage One: Electrostatic Precipitator

Stage Two: Ozone Filtration

Stage Three: Carbon Filtration

Table 4.14 (page 72) in the DEFRA guidance “anticipated relative cost effectiveness based on a well-maintained system” details the level of odour abatement expected to be achieved relative to the equipment installed. Cross referenced against this table the specification outlined in this document would result in a medium-high level of odour abatement being achieved at Peri Chicken – Caversham Road, Reading.

Electrostatic Filtration

Contaminated air is drawn by the fan through a washable metal mesh pre-filter which traps large particles. The remaining particles, some as small as 0.01 microns, pass through a strong electrical field (ionizing section) where the particulates receive an electrical charge. The charged particles then pass onto the collector plates section made up of equally spaced parallel plates. Each alternate plate is charged with the same polarity as the particles, which repel, while the interleaving plates are grounded, which attract and collect the contaminants. The contaminants are held on these plates until they are washed off.

Ozone Filtration

How does ozone work?

The third oxygen atom of ozone makes it extremely reactive. This atom readily attaches itself to other odour molecules. When contaminants such as odours, or bacteria mix with ozone, their chemical structure is changed to less odorous compounds. As more ozone attacks the remaining compounds, the

Company No – 07157519 Extechnology Europe Limited – 23 Holywell Row, London EC2A 4JB

odour is eventually destroyed. This process is called oxidation. Ozone essentially reverts back to oxygen after it is used. This makes it a very environmentally friendly oxidant.

How is ozone produced?

Ultra-violet (UV) light creates ozone when a wavelength at 254 nm (nanometers) hits an oxygen atom. Both processes split oxygen molecules into single oxygen atoms (O). These atoms combine with another oxygen molecule (O₂) to form ozone (O₃).

Activated Carbon Filters Metal Cased Discarb Cells

Applications

Activated Carbon Discarb Cells can be used for the reduction of odour or for gas control.

Activated Carbon Discarb Cells offer a compact and convenient method to housing bonded carbon panels ready for mounting in a range of filter housings. Typical applications for Activated Carbon Cells include Kitchen Extract Odour Control, Commercial Food Manufacture, Laboratory supply and extract systems, Office Air Supply, and VOC control.

Activated Carbon Discarbs offer a practical solution for controlling gases and odours in airflows from 0.1m³/s up to 10m³/s +.

Description

The metal cased 'Discarb' cells have the highest carbon loading in our range, and have standard or heavy-duty carbon panels permanently sealed into a galvanised sheet steel casing. This construction gives a very strong unit capable of handling large air volumes or where conditions dictate, increased contact time. The advantage of this unit is that with panels sealed in, there is no possibility of air leakage. Activated Carbon Discarb Filter Units can be manufactured to almost any reasonable size, the limiting factors being the

overall weight for handling purposes and the size of individual panels. When the unit has finished its useful life it is discarded and replaced with a complete new cell.

Technical

Carbon Filters must be selected based on system duty airflows, and required contact times (dwell / residence). Contact times must be selected based on concentration and specific gases / odours that need to be removed. The following tables on the next page offer selections for Activated Carbon Discarbs of all styles based on 0.1 second contact times. For 0.2 second contact times reduce the airflows in the 0.1 second tables by 50%, pressure drops will reduce to 50%. For 0.3 second contact times reduce the airflows in the 0.1 second tables to 33.3%, pressure drops will reduce to 33.3%. For 0.4 second contact times reduce the airflows in the 0.1 second tables to 25%, pressure drops will reduce to 25%. Pre filtration of grade M5 to EN779 is recommended prior to Activated Carbon Filters to aid effective gas removal. Max allowable air on conditions to the unit are 40 Degree Centigrade and 80% Relative Humidity, if these conditions are exceeded then the activated carbon filter will be ineffective.

ACTIVATED CARBON DISCARB FILTERS - EXTRA DUTY

H	W	D	m ³ s	Pa.
293	293	293	0.13	125
293	293	445	0.20	175
293	293	597	0.27	250
445	445	293	0.30	95
445	445	445	0.41	125
445	445	597	0.54	185
597	597	293	0.54	125
597	597	445	0.80	150
597	597	597	1.06	225
597	293	597	0.53	225
597	196	597	0.35	225

Activated Carbon Filters Metal Cased Discarb Cells

Applications

Activated Carbon Discarb Cells can be used for the reduction of odour or for gas control. Activated Carbon Discarb Cells offer a compact and convenient method to housing bonded carbon panels ready for mounting in a range of filter housings.

Typical applications for Airclean Activated Carbon Cells include Kitchen Extract Odour Control, Commercial Food Manufacture, Laboratory supply and extract systems, Office Air Supply, and VOC control.

Activated Carbon Discarbs offer a practical solution for controlling gases and odours in airflows from 0.1m³/s up to 10m³/s +.

Description

The metal cased 'Discarb' cells have the highest carbon loading in our range, and have standard or heavy-duty carbon panels permanently sealed into a galvanised sheet steel casing.

This construction gives a very strong unit capable of handling large air volumes or where conditions dictate, increased contact time. The advantage of this unit is that with panels sealed in, there is no possibility of air leakage.

Activated Carbon Discarb Filter Units can be manufactured to almost any reasonable size, the limiting factors being the overall weight for handling purposes and the size of individual panels. When the unit has finished its useful life it is discarded and replaced with a complete new cell.

Technical

Carbon Filters must be selected based on system duty airflows, and required contact times (dwell / residence). Contact times must be selected based on concentration and specific gases / odours that need to be removed.

The following tables on the next page offer selections for Activated Carbon Discarbs of all styles based on 0.1 second contact times.

For 0.2 second contact times reduce the airflows in the 0.1 second tables by 50%, pressure drops will reduce to 50%.

For 0.3 second contact times reduce the airflows in the 0.1 second tables to 33.3%, pressure drops will reduce to 33.3%.

For 0.4 second contact times reduce the airflows in the 0.1 second tables to 25%, pressure drops will reduce to 25%.

Pre filtration of grade M5 to EN779 is recommended prior to Activated Carbon Filters to aid effective gas removal.

Max allowable air on conditions to the unit are 40 Degree Centigrade and 80% Relative Humidity, if these conditions are exceeded then the activated carbon filter will be ineffective.



ACTIVATED CARBON DISCARB FILTERS - STANDARD FLOW						
Dimensions (Actual, mm)			m ³ /s	Pa	Grade 20 – Std. Flow	Grade 50 – Std. Flow
H	W	D			Part No.	Part No.
293	293	293	0.10	75	1620101	1620121
293	293	445	0.15	95	1620102	1620122
293	293	597	0.22	140	1620103	1620123
445	445	293	0.21	55	1620104	1620124
445	445	445	0.31	70	1620105	1620125
445	445	597	0.41	105	1620106	1620126
597	597	293	0.41	70	1620107	1620127
597	597	445	0.61	90	1620108	1620128
597	597	597	0.81	130	1620109	1620129
597	293	597	0.40	130	1620110	1620130
597	196	597	0.27	130	1620111	1620131

ACTIVATED CARBON DISCARB FILTERS - EXTRA DUTY						
Dimensions (Actual, mm)			m ³ /s	Pa	Grade 20 – Extra Duty	Grade 50 – Extra Duty
H	W	D			Part No.	Part No.
293	293	293	0.13	125	1620201	1620221
293	293	445	0.20	175	1620202	1620222
293	293	597	0.27	250	1620203	1620223
445	445	293	0.30	95	1620204	1620224
445	445	445	0.41	125	1620205	1620225
445	445	597	0.54	185	1620206	1620226
597	597	293	0.54	125	1620207	1620227
597	597	445	0.80	150	1620208	1620228
597	597	597	1.06	225	1620209	1620229
597	293	597	0.53	225	1620210	1620230
597	196	597	0.35	225	1620211	1620231

Notes

- * Airflow rates are based on a 0.1 second contact time. (Indian & Thai Cuisine require minimum of 0.3s)
- * Grade 20 20 - 30% retention CTC. Grade 50 50 - 60% retention CTC.

Holding Frames and Cases

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

See Catalogue Section 8 (AC8) and Section 11 (AC11) for full information.



Fully Welded Side Withdrawal
Filter Housing (1840)



Kitchavent – Grease, Smoke and Odour Control
for Kitchen Extract (1815)

O & M INSTRUCTION

PRODUCT GROUP 1620 ACTIVATED CARBON DISCARBS

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 filter to be replaced.

Replace with new filter.

Unlike a particulate filter the resistance will not vary as the carbon adsorbs the odours, and the time that a carbon filter will last before a new one is needed will vary according to the range and amount of odours.

A test sample filter can be supplied which you return to ourselves for analysis, which knowing how long it has been in service, we can then provide an approximate prediction as to when the filter will require replacement.

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

Activated Carbon Filters Use and Selection

Carbon panels are normally supplied and fitted with an aluminium frame and can be made to any reasonable size to match existing panels of all makes. The depth of panel is restricted by our own imposed limits of not less than 10mm and not greater than 60mm Actual depth.

Capacities shown for Panels & 'Discarb' units are based on a dwell time of 0.1 seconds, which is the normally accepted minimum for most applications.

Air Flow = Width x Length x Depth/Dwell Time
or Air Flow = Width x Length x Face Velocity

As a guide,



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

For 'heavier' odours i.e. Indian cooking odours, a contact time of 0.3 seconds is recommended, which will effectively reduce the Face Velocity and rating to one third..

Where hot air is being filtered (e.g. extract from cooker hoods) the carbon cells should be positioned as far from the heat source as possible.

Air stream temperatures must be maintained below 40Deg C. and humidity levels below 80% RH. If temperatures or humidity in excess of either of these figure are anticipated, the airstream must be treated to ensure compliance. Additional fresh air, and or cooling may be considered as suitable measures.

Pre-filters should be fitted in the ventilation system to protect the carbon filters in all installations from particulate contamination. We do not consider a glass panel to be suitable and recommend a filter having a minimum grade of F5 to EN779.

Some cooking operations give off large amounts of smoke, which is extremely detrimental if allowed to reach the carbon filters(smoke is a particulate).

In most cases this can be overcome by the use of a good quality pre-filter. e.g. an F8 Grade Bag Filter or better, depending upon circumstances. In some instances a HEPA Filter grade H14 is necessary.

'Discarb' Cells can be 'tailor-made' to any reasonable size to fit ducting, air-handling units etc.

Activated carbons are graded as follows :

Grade 20 Activity Carbons are rated 30% on their ability to 'adsorb' carbon tetrachloride (CTC) in testing; and have a typical surface area per weight of between 700-800 m²/g by the BET N2 method (the area being a measure of the area of the walls of the cavern like structure of the activated carbon); Bulk density is between 0.55 - 0.59 g/cc

Grade 50 Activity Carbons are rated 55% on their ability to 'adsorb' carbon tetrachloride (CTC) in testing; have a typical surface area per weight of between 1100-1200 m²/g by the BET N2 method (the area being a measure of the area of the walls of the cavern like structure of the activated carbon); Bulk density is between 0.49 - 0.53 g/cc

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	ACETALDEHYDE	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	ACRYALDEHYDE	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	BUTADEINE	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	CHLOROBUTADEINE	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	DICHLOROMETHANE	A	
64	DICHLOROMONOFLUORO 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.

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 ² /s	47mm m ² /s	97mm m ² /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

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

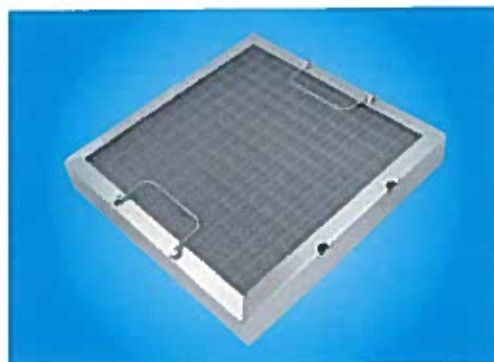
Grease Filters

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 *
EAGFI2121	12 x 12 x 1	292	292	20	0,19
EAGFI2122	12 x 12 x 2	292	292	45	0,19
EAGFI6161	16 x 16 x 1	394	394	20	0,33
EAGFI6162	16 x 16 x 2	394	394	45	0,33
EAGFI8181	18 x 18 x 1	445	445	20	0,42
EAGFI8182	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.

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 Chicken / 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:

(Please see details given by Extechnology Europe Ltd)

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 21 carbon discarb cells.

For 0.3 seconds contact time- Typically recommended for Spicy cuisine such as Thai / Indian / Grill & Steakhouse.

1 Carbon cell volume: 0.33m³ @ 0.1s dwell

3 Carbon cells volume: 1 m³/s @ 0.1s dwell

So therefore @ 2.14m³/s = 7 Carbon cells @ 0.1s dwell for 0.3s dwell 7 x 3 = 21 Carbon cell required.

Therefore a minimum of 21 Extra Duty carbon cells must be used.

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.

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 : 3000 x 1400 x 400 / 500

The canopy will be manufactured from stainless steel grade 304, with a 400mm front and 500mm 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	= 4.20m2
Design volume	= 2.14m3/sec

Total number of grease filters 6 / Dimensions 495*495*45
Design Volume 2.14m3/s / 6 = 0.36m3/s

6 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 3.0mtr hood, the extract duct will then continue up to the plant section which will run horizontally against the kitchen ceiling internal of the building before going up to the vertical discharge flue above eaves which will appear externally with its Acoustic silencer and acoustic jacket enclosed extract fan.

The extract hood will have a clearance of 2mtr to the front underside, the plant section will consists of a 3 stage filtration system after the extract hood grease baffle filters, the system will comprise of a ESP Unit / UV Treatment and Carbon filtration (**please see details by Extechnology**) 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 vertical discharge flue will be of a high Velocity Discharge cowl which will be set 1mtr above the eves. The High Velocity Cowl is ideal for good dispersion of fumes.

Duct Dimensions of extraction system & flue

The duct work size is approximately 500*500 or equivalent and at the discharge point will be 400 dia

$$.5 \times .5 = 0.25\text{m}^2 \text{ (air across duct section)}$$

$$2.14\text{m}^3/\text{s} / 0.25 = 8.56\text{m}/\text{second} \text{ (air speed in duct)}$$

The efflux velocity is **17.03m/second** and the duct work will be free from grease disperse all fumes to high level.

$$(2.14\text{m}^3/\text{s} / 0.12566\text{m}^2) \text{ (free area inside 400 dia duct or equivalent) } = \mathbf{17.03\text{m/s velocity}}$$

Extractor Fan Specification

Located within the duct work is a S&P CVAT/4-12000/560N D 2.2 ACCOUSTIC ENCLOSED EXTRACTER FAN, 4 pole, 3 phase, speed control via Transformer /Inverter regulator.

This fan runs at 1470rpms with a maximum operating noise of 71dBA and will handle air flow rate in excess of 2.224m³/sec @ 500pa.

Flue design:

The vertical discharge flue is a 400 dia or equivalent High Velocity Discharge Cowl , the flu will be above 1mtr above eves (please see plans and drawing section for this view)

Noise:

**PLEASE SEE ACCOUSTIC DETAILS PROVIDED BY RANDTECH
CONSULTANTS**

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.

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.

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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: $2.14\text{m}^3/\text{s}$ (canopy hood design volume) $\times 3600 = 7,704\text{m}^3/\text{hr}$

Cook area $3.7\text{m} \times 4.3\text{m} \times 2.4\text{m} = 38.18\text{m}^3$ recommended air change rate for commercial kitchen is 60 ach

The air change rate equates to $7,704\text{m}^3/\text{hr}$ divided by the Kitchen volume 38.18m^3 . This gives us an air change rate of 201.78ach. 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 $2.14\text{m}^3/\text{s}$ ($7,704\text{m}^3/\text{hr}$) $\times 85\%$ requires $= 1.82\text{m}^3/\text{s}$ ($6,552\text{m}^3/\text{hr}$)

Pressure Lost in Air- Supply System

Allowing for 45 pa filter / (450×450 duct $= 8.66\text{m/s}$ velocity) 100 pa duct / 80 pa grille / bends 30 / **$= 255\text{pa}$ clean / 260pa dirty**

Air-Supply Fan and Grill Specification

Fan selected: SLC400/2-1 Axial Fan, 2 pole, Single phase, speed regulated via Inverter Drive.

This fan runs at 2780rpms with a maximum operating noise of 66dBA and will handle air flow rate in excess of $1.84\text{m}^3/\text{sec}$ @ 261pa.

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.