



JOSTEC LTD

20 NORCOT ROAD, READING

ODOUR ASSESSMENT - KITCHEN EXTRACT

TECHNICAL REPORT: RFE-0508-23-01-03 AQ FINAL

DATE: JULY 2023



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20 NORCOT ROAD, READING ODOUR ASSESSMENT – KITCHEN EXTRACT

CONTENTS

1	INTRODUCTION	4
1.1	Proposed Development.....	4
1.2	Site Location	4
2	POLICY AND GUIDANCE	5
2.1	Planning Policy	5
2.2	Guidance.....	5
3	ASSESSMENT METHOD.....	6
3.1	Assessment Approach	6
4	ODOUR RISK ASSESSMENT	7
4.1	Odour Risk	7
5	MITIGATION.....	8
6	CONCLUSIONS.....	9
	Appendix A: Figures	10



1 INTRODUCTION

RF Environmental Ltd (RFE) has been commissioned to undertake an odour assessment in support of a planning application at 20 Norcot Road, within the administrative boundary of Reading Borough Council (RBC).

The operational phase of the proposed development has the potential to cause loss of amenity to existing receptors, from additional emissions associated with the commercial kitchen. Odour emissions have been considered in this assessment.

1.1 Proposed Development

The proposed conversion is from a shop to a pizza restaurant. The restaurant will be situated on the ground floor of a three-storey building. The first and second floors are residential.

A fan and extraction unit is proposed at the rear elevation of the building, with the flue extending 1.5m above the eaves.

The site elevations plan is presented in Figure A1 in Appendix A.

1.2 Site Location

The surrounding area is a mixture of residential and commercial property. The site is bounded by Norcot Road to the northwest. The mixed use properties adjacent to the site generally have commercial on the ground floor and residential on the higher floors. The nearest property to the site is located c. 4m northeast, separated by a narrow path, and is two storeys in height. There is space belonging to the car valet business immediately southeast of the site, beyond this space there are a row of two storey, mixed use properties. Other surrounding buildings within 20m of the site are two storeys in height.

The proposed development location is presented in Figure A2 in Appendix A.



2 POLICY AND GUIDANCE

2.1 Planning Policy

2.1.1 National Policies

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) (2021)¹ sets out the government's planning policies for England, but does not refer directly to odour.

2.1.2 Local Policy

RBC's Local Plan² was adopted on 4th November 2019. There are no policies directly relating to odour from commercial kitchens.

2.2 Guidance

National Planning Practice Guidance

The government has revised and updated the national planning practice guidance³ to support the NPPF in order to make it more accessible. The guidance mentions that odour and dust can also be a planning concern, because of the effect on local amenity.

Defra's Guidance

Defra's Guidance on the control of Odour and Noise from Commercial Kitchen Exhaust systems (2005)⁴ provides guidance on a risk assessment procedure and provides best practice for the design and operation of commercial kitchen ventilation systems and the control of grease, odour and noise emissions. The guidance was withdrawn in September 2017, however this guidance is still widely used and considered applicable when assessing odour from a commercial kitchen.

As indicated in the Defra document, the level of odour nuisance from a kitchen extraction system is related to: the size of the cooking facility; the type of food prepared; and the type of cooking appliances.

This approach considers the location, scale and nature of the commercial kitchen, the location and operating parameters of the extraction system, and the sensitivity of the local area to determine the risk of odour effects.

¹ Ministry of Housing, Communities and Local Government. National Planning Policy Framework. July 2021.

² Reading Borough Council. Reading Borough Local Plan 2019.

³ Ministry of Housing, Communities and Local Government. 2019. Planning Practice Guidance: Air Quality. Available from: <https://www.gov.uk/guidance/air-quality--3> (Accessed 28/04/2023)

⁴ Department for Environment, Food and Rural Affairs, 2005. Guidance on the control of Odour and Noise from Commercial Kitchen Exhaust systems.



3 ASSESSMENT METHOD

3.1 Assessment Approach

A qualitative risk assessment of the odour impacts has been undertaken in line with the method outlined in Annex C of Defra's document 'Guidance on the control of Odour and Noise from Commercial Kitchen Exhaust systems'.

The guidance provides a method of assessing the risk by scoring the below four criteria:

- dispersion – the height and velocity of the final discharge in relation to surrounding buildings;
- proximity of receptors - the location of the nearest residents;
- kitchen size - number of covers, i.e. level of activity; and
- cooking type – grease and odour loading.

Details of the extraction fan and flue design provided, determines the predicted level of dispersion. The flow rate, in meters per second, has been calculated based on the airflow at optimum efficiency and the diameter of the circular duct. The information is based on the manufacturers technical information sheet, presented in Figures' A3 and A4 of Appendix A. An online calculation form was used to assist with the calculation⁵.

Online mapping and aerial photograph resources was used to identify the proximity of existing receptors.

The number of covers determines the kitchen size and the cooking type signifies the level of odour and grease loading.

Defra's guidance gives indicative scores for the four criteria above.

The sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type provides a 'significance score'. The 'significance score' for the proposed kitchen determines the impact risk and hence the level of odour control required. Based on these findings, appropriate mitigation has been identified.

⁵ Calculator Edge. Available from: <http://www.calculatoredge.com/optical%20engg/air%20flow.htm>. Accessed 27/04/2023.

4 ODOUR RISK ASSESSMENT

4.1 Odour Risk

	Descriptor	Score	Impact risk	Odour Control Requirement
Dispersion	Poor	15	High	High level of odour control
Proximity of receptors	Close	10		
Size of kitchen/food cooking area	Medium	3		
Cooking type (Odour and grease loading)	Low	1		
Total		29		

TABLE 4.1 ODOUR RISK ASSESSMENT SCORING

The proposed flue will be at the roof level, 1.5 metres above the eaves, and is expected to be below 10 m/s. The surrounding buildings within 20m of the proposed development are two storeys in height. The proposed development is located on the ground floor of a three storey building. There are no bends in the ducting and the final discharge will be vertically upwards. Dispersion has been classed as 'Poor'.

The nearest existing residential receptors are located within the same building as the restaurant, on the first and second floors. There is no window at the rear of the building on the second floor. There are also residential receptors within 20m of the site, on the first floors of the adjacent buildings. The proximity of receptors has been classed as 'Close'.

The proposed number of covers is expected to be 50 per day and therefore the kitchen has been classed as 'Medium' in the risk assessment.

The menu is expected to comprise predominantly pizza dishes. The odour and grease content is expected to be medium, with an odour description of 'herb'. The grease loading and moisture content is expected to be Medium. The odour and grease content is expected to be 'Low'.

The results of the assessment give a 'significance score' of 29 and an impact risk of High. A high level of odour control is therefore recommended.

5 MITIGATION

Based on the 'High' risk level of potential nuisance, a high level of odour mitigation is recommended.

Filters can be applied to treat kitchen ventilation air. The proposed extraction system includes six filters in the canopy. These can include a primary and secondary grease filter, a final bag filter and odour control which could be in the form of a carbon filter or UV ozone system.

A carbon filter or box is proposed to be incorporated into the air duct. Carbon filtration units are an efficient way of controlling grease, smoke and odour emissions. The carbon filters will need to be fitted and sized to achieve a 0.2 - 0.4 second dwell time to provide a high level of odour control, as per Defra guidance. It is recommended that the carbon filters are changed every 4 – 6 months. An example of carbon filtration units are the Sitesafe carbon filters, comprising panels of activated carbon. An example of a single Sitesafe carbon filter provided by PurifiedAir is presented in Figure A7 of Appendix A.

The flue is proposed to be at least 1.5m above the eaves of the building.

A typical set-up is presented in Figure A5 of Appendix A and an example of the exterior of the proposed set-up is presented in figure A6 of Appendix A.

The final design of the extraction system need not necessarily comprise these exact elements, but will need to offer a similar high level of odour control.

It is recommended that the proposed extraction system, filters and carbon filters are properly maintained in line with manufacturer recommendations.



6 CONCLUSIONS

Although the odour and grease loading is small and the size of the kitchen is medium, the proximity of receptors and level of dispersion mean that the risk assessment for kitchen odour has found a 'High' impact risk. Therefore, a high level of odour control is recommended.

Proposed mitigation comprises six filters, including a primary and secondary grease filter. A carbon box filtration system is also proposed. It is important that regular maintenance is undertaken, in accordance with manufacturer recommendations.

Provided that the final flue design incorporates suitable mitigation and maintenance, then it is considered that the proposed development will not harm the amenity at nearby receptors or at receptors introduced by the proposed development.



Appendix A: Figures

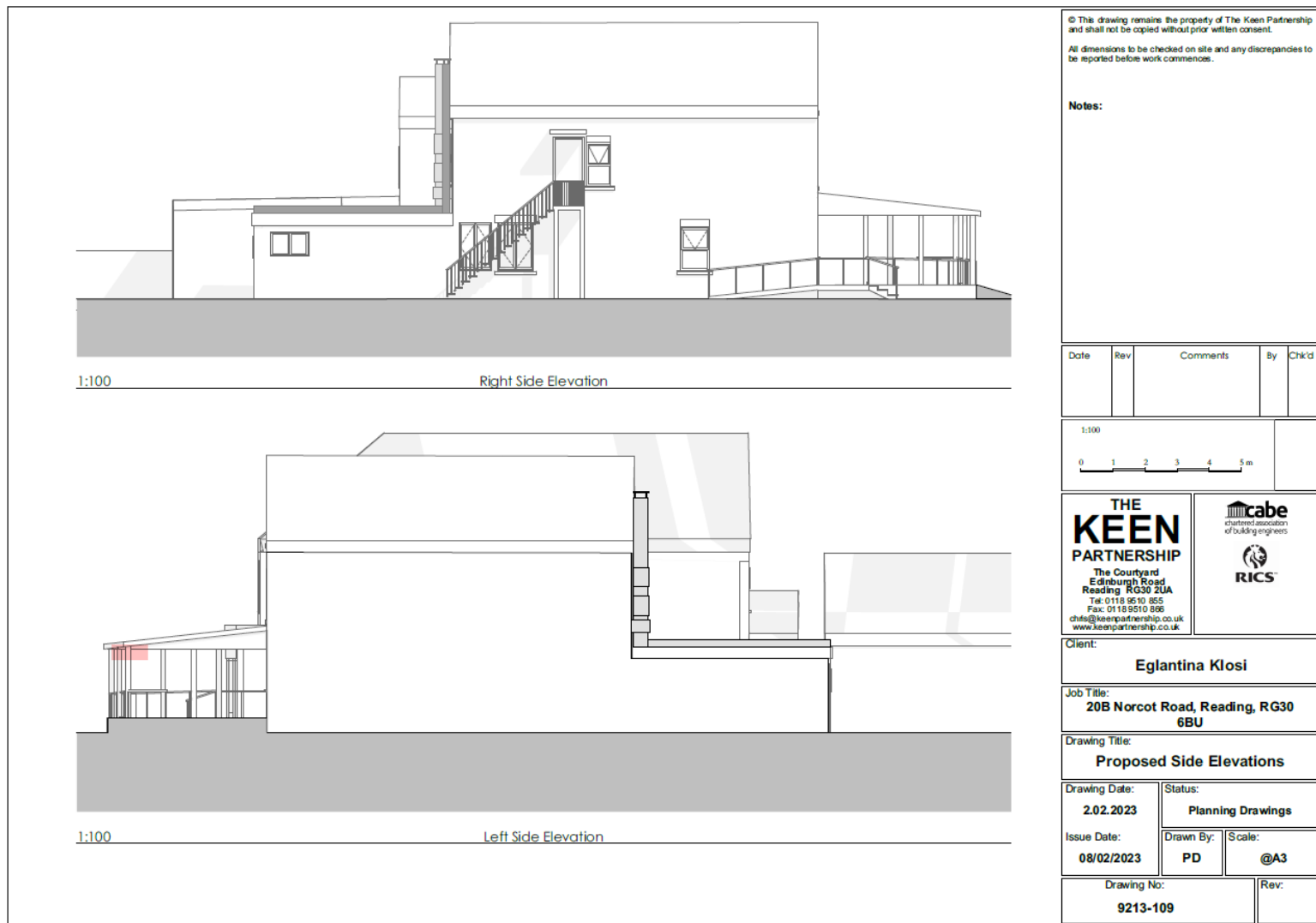


FIGURE A1: SIDE ELEVATIONS PLAN

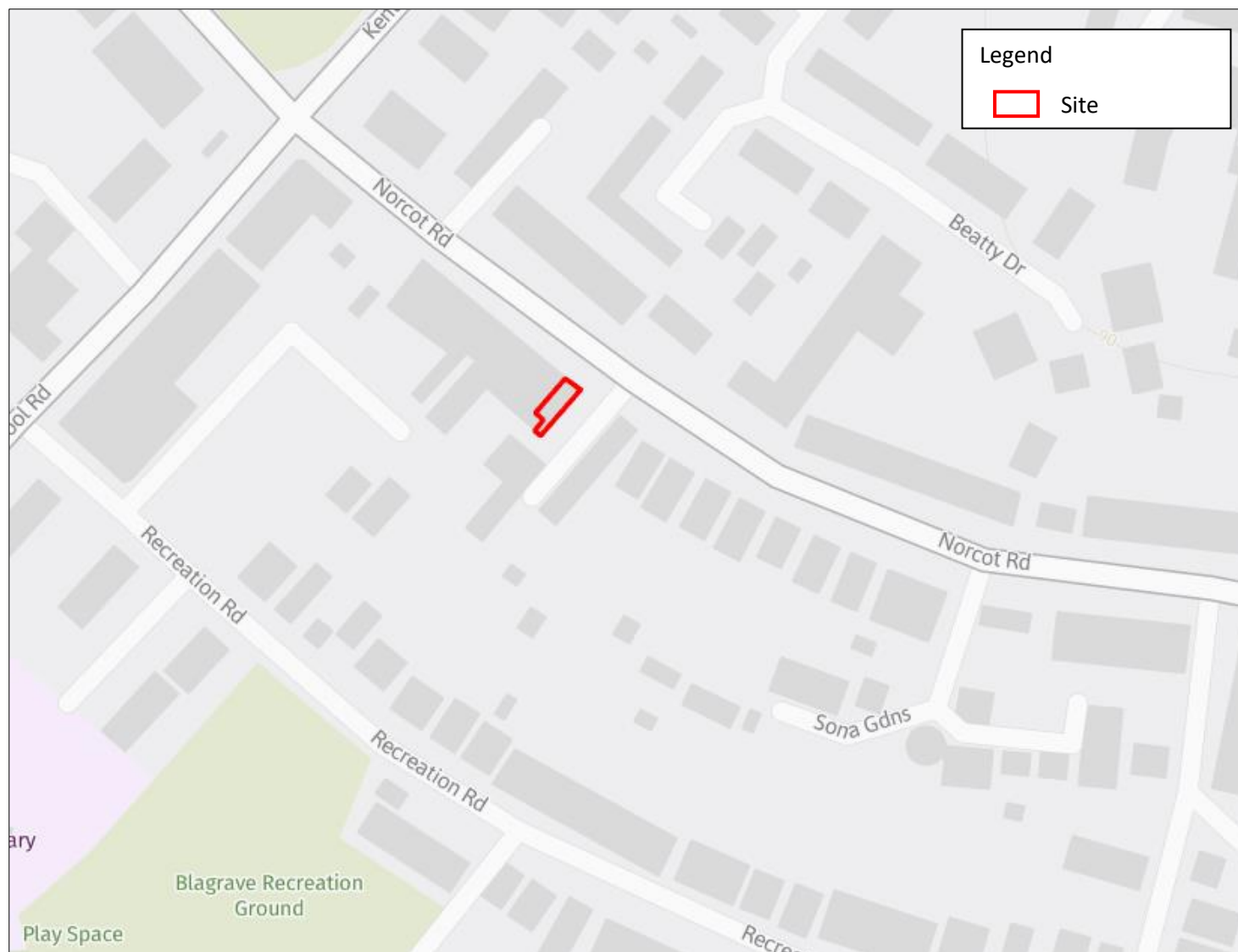


FIGURE A2: SITE LOCATION



TCBBX2/TCBTX2

5605764700 - TCBBX2/4-450 (230V50Hz) V5 - CYLINDRICAL CASED AXIAL FLOW FANS



Cased axial fan. Casing manufactured from galvanised sheet steel. Fitted with 2 contrarotating fan assemblies with aluminium blades. Single phase - IP65 - F motor with thermal protector and terminal box with capacitor out of the air stream. Brand S&P model TCBBX2/4-450 (230V50Hz) V5.

Theoretical Working Point

Airflow	-
Static Pressure	0,000 Pa
Temperature	20 °C
Altitude	0 m
Density	1,2 kg/m ³
Frequency	50 Hz

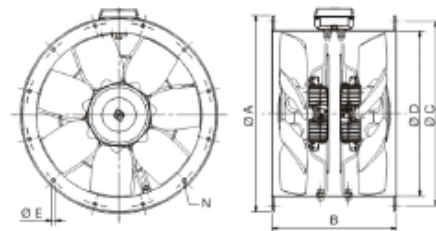
Construction

Discharge diameter	450 mm
Fan size	450
Blades	7
Weight	42,00 kg

Motor Characteristics

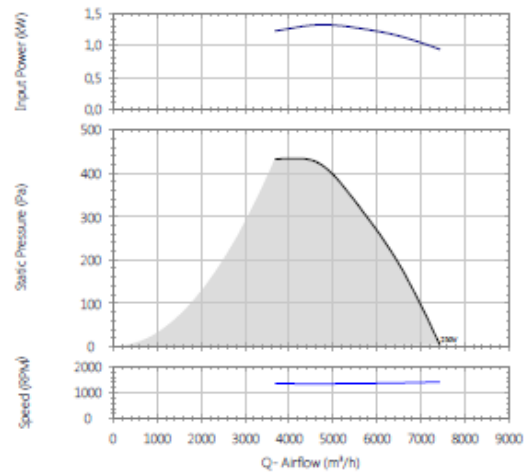
Number of poles	4
Voltage	1-230V-50Hz
Maximum absorbed current	5,7 A
IP Rating	IP65
Motor insulation class	F

Drawing



A	B	C	D	E	N
537	375	500	450	12	8

Performance Chart



Sound Performance

	63	125	250	500	1k	2k	4k	8k	Overall
Inlet (LwA)	46	73	85	82	85	79	72	64	90
Inlet LpA @ 1m	35	62	74	71	74	68	61	53	79
Outlet (LwA)	63	75	86	85	87	82	74	67	92
Outlet LpA @ 1m	52	64	75	74	76	71	63	56	81



q = 1

FIGURE A3: MANUFACTURERS FLUE AND FAN TECHNICAL INFORMATION SHEET



TCBBX2/TCBTX2

5605764700 - TCBBX2/4-450 (230V50HZ) V5 - CYLINDRICAL CASED AXIAL FLOW FANS

ErP Data

Maximum efficiency η [%]	41,9
Installation type	C
Category efficiency	Static
N	N47,5
Variable speed drive	+
Year of manufacture	Product Rating Plate
Manufacturer's Info	S&P
Product code	5605764700
Input power at optimum efficiency point (kW)	1,316
Airflow at optimum efficiency point (m ³ /h)	4.842
Pressure at optimum efficiency point (Pa)	411
Speed at optimum efficiency point	1349
Specific Ratio	1
Recycling/disposal	Instruction Manual
Maintenance	Instruction Manual
Additional components	Catalogue and according to ISO 5801

FIGURE A4: MANUFACTURERS FLUE AND FAN TECHNICAL INFORMATION SHEET

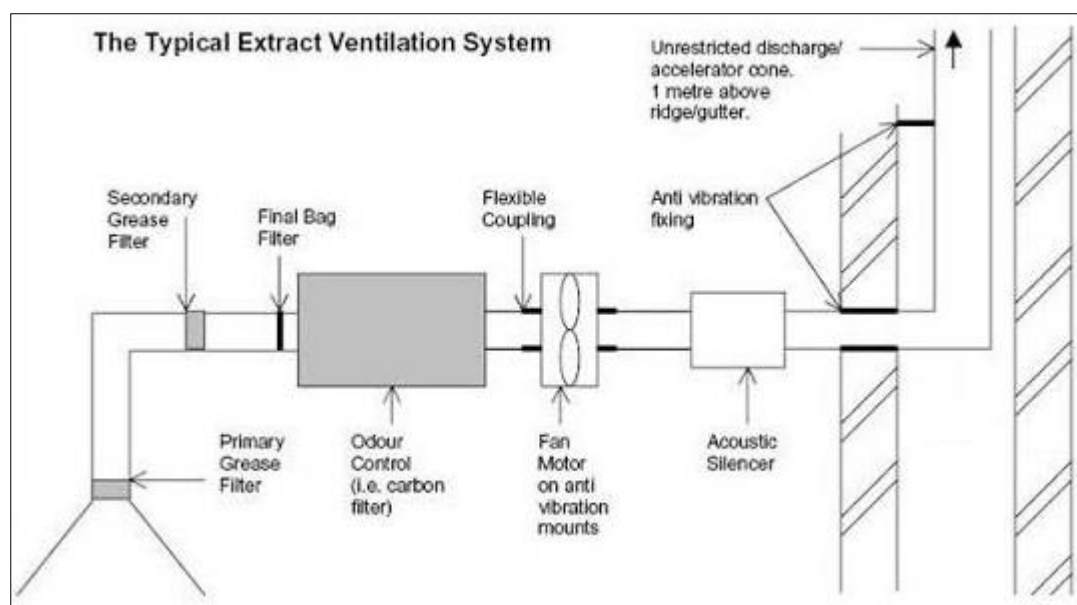


FIGURE A5: TYPICAL EXTRACT VENTILATION SYSTEM WITH MITIGATING FILTERS



FIGURE A6: EXAMPLE OF PROPOSED EXTRACTION SYSTEM

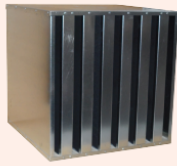
Sitesafe Carbon Filters

We manufacture Sitesafe carbon filters, these innovative carbon units measure 594x196x597mm, three combining to 594x594x597mm, directly replacing our original carbon blocks whilst providing exactly the same filter performance as an existing full size cell.

Their advantage is that they only weigh 18kg each against the 68kg of our original blocks. This takes the strain out of fitting and servicing, allowing only one engineer to complete the task where two had been previously required.

Our Sitesafe carbon filters use panels of activated carbon to remove the malodorous gases within the commercial kitchen extract duct through the process of chemical adsorption. By installing our ESP units before our Sitesafe filters, the carbon life span is greatly increased, allowing it to nullify malodours at optimum efficiency for much longer.

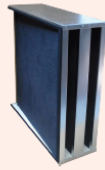
Will require two people plus lifting gear to carry and install.



Carbon PA242424

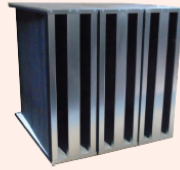
Size 594x594x597
Gross Weight 68.20kg
Carbon Weight 50.00kg
Rated Airflow 3600m³/hr*
Pressure Drop 120Pa

Safe for one person to carry. No special lifting gear required.



Sitesafe PA240824

Size 594x196x597
Gross Weight 17.95kg
Carbon Weight 16.6kg
Rated Airflow 1200m³/hr*
Pressure Drop 120Pa



Sitesafe 3 x PA240824

Size 594x594x597
Gross Weight 53.85kg
Carbon Weight 50.00kg
Rated Airflow 3600m³/hr*
Pressure Drop 120Pa



Please see below for the recommended minimum dwell times required for different applications and scale up accordingly.

It should be noted that filtration performance will be improved by increasing the dwell times applied.

Application	Recommended Dwell Time	Grade
Cooking - Low Odour, Tea Shop, Canteens	0.1 to 0.2 Seconds	Carbon grade Enhanced for improved performance for light catering odours
Cooking - Moderate Odour: Pizza, Steak House, French, Italian, Pubs, Chinese, Japanese, Cantonese	0.2 to 0.4 Seconds	Enhanced Carbon grade suitable for many applications 85% Minimum CTC
Cooking High Odour, Indian, Thai, Vietnamese, Kebab	0.4-0.6 Seconds	Enhanced Carbon grade suitable for many applications 85% Minimum CTC
Cooking Very High Odour: Fried Chicken, Pubs with large fried food turnover, Fish and Chip Shops, Fast Food / Burgers	0.4-0.8 Seconds	Enhanced Carbon grade suitable for many applications 85% Minimum CTC
Reduction of Kerosene Exhaust fumes	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Ozone	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Diesel Fumes, including H ₂ S, SO ₂ , NOX, HCl	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO ₂ SOX NO ₂ NOX Removal
Museum and Archives	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO ₂ SOX NO ₂ NOX Removal

The cooking odour classes above are as classified by DEFRA in **Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems, PB10327**

FIGURE A7: EXAMPLE OF CARBON FILTERS