

20 PORTMAN ROAD

RG30 1EA

Odour Impact Assessment

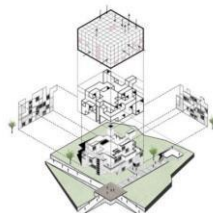


GOYA WORKS

GOYA WORKS LTD

18/08/2023

Project No: G0098

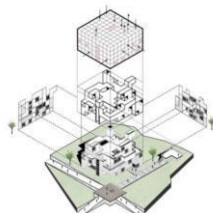


Notice

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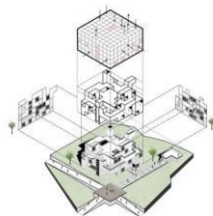
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Content

1. INTRODUCTION	4
2. ODOUR FROM COMMERCIAL KITCHEN EXHAUST SYSTEMS	5
3. RISK ASSESSMENT AND VERIFICATION SITE VISITS	11
4. SYSTEM DESCRIPTION AND RECOMMENDATIONS	12
5. CONCLUSION	13
6.EXECUTIVE SUMMARY	18



1. INTRODUCTION

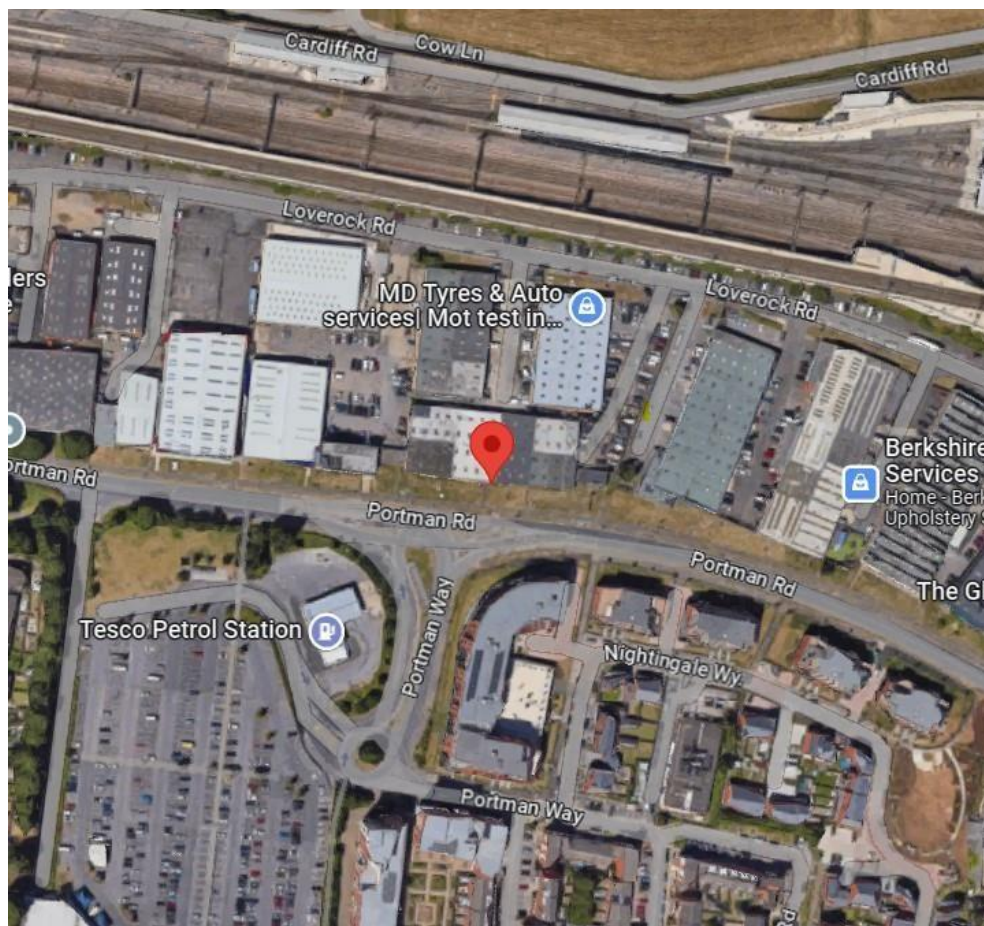
1.1. Background

In July, Goya Works was instructed by Mr Jayakumar Madanagopal to design new an extraction system solution for the new proposed kitchen at 20 Portman Road in support of their planning application.

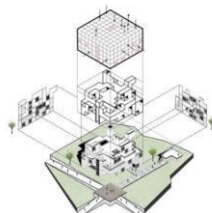
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1.2. The Site and Surrounding Area

This property is a retail space located on the ground floor at 20 Portman Road in the center. It faces Norcot, which is not a heavily trafficked transportation route, but it connects to the Reading. The site is in a mostly commercial area with several shops surrounding it. Therefore, the chosen position for the fan and extraction unit has been considered based on this criteria.



Picture 1. Site Location



2. ODOUR FROM COMMERCIAL KITCHEN EXHAUST SYSTEMS

2.1. Introduction

Offensive and objectionable odours can cause significant adverse effects on the lives of people and their wellbeing. In urban areas problems associated with nuisance odour emissions from commercial kitchen exhausts are very common. Overall responsibility for enforcement of statutory controls rests with the Local Authorities. These responsibilities cross a number of their regulatory functions including:

- Planning
- Environmental Health  Building control.

There are two reference publications available to Local Authorities in this area both of which are published by the Department for Environment Food and Rural Affairs. These are:

- [Odour Guidance for Local Authorities \(March 2010\)](#)
- [Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems \(January 2005, defra\).](#)
-  [Control of Odour and Noise from Commercial Exhaust Systems \(2018, EMAQ+\)](#)

This report has been prepared by following the guidance and methodologies outlined in these documents.

2.2. What is Odour

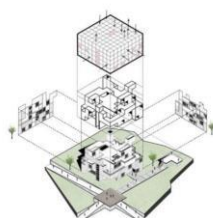
An odour is an organoleptic attribute perceptible by the olfactory on sniffing certain volatile substances. Odorous substances have a property that makes them perceptible to our sense of smell and the term odour refers to the stimuli from a chemical compound that is volatilised in air. Odours may be perceived as being pleasant or unpleasant and can trigger strong reactions for good reason. Unpleasant odours can be useful indicators to protect us from harm such as the ingestion of rotten food. Whilst normally there is general agreement as to what are pleasant and unpleasant odours there is a wide variation between individuals as to what is deemed to be unacceptable and what affects our quality of life.

2.3. Odour Characteristics and Attributes

There are five basic sensory properties of odour:

1. Detection Threshold – the concentration at which odour is first detected;
2. Recognition Threshold – the ability to differentiate between two odours;
3. Intensity – perceived strength at different concentrations;
4. Hedonic Tone - pleasant or unpleasant;
5. Odour Quality or Character – association and complexity.

Our responses to odours vary greatly between individuals and not all unpleasant odours are offensive at all times. For example coal fire smells can be 'comforting' at times yet the smell of soot can be



objectionable at other times. It is argued that when an individual is exposed to an odour perceived as being unwanted the following factors are the main determinants:

- Offensiveness of the odour;
- Intensity of the odour;
- Duration of the exposure to the odour;
- Frequency of the odour exposure; and
- Tolerance and expectation of the exposed subjects.

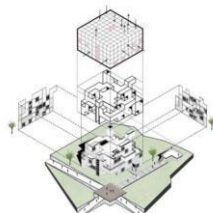
Studies of environmental exposure to odour at different concentrations over different time periods have led to a number of conclusions as to how individuals perceive odour, and how this is established and then retained in memory. Studies in communities when odour nuisance is abated show that the perception of odour impact is reported for prolonged periods by those living in the area even years after the odour is no longer present. From these studies it is evident that:

- The nuisance suffered is not caused by short-term exposure to environmental odours and similarly are not reduced by short-term mitigation or prevention;
- The association between an individual's perception and experience of nuisance from an odour is persistent and prolonged. For such individuals, exposure to the same odour at lower concentrations causes greater nuisance than for those without a history of exposure; and
- The perception of annoyance/nuisance appears to be cumulative, developing over long periods of time. Memory of periods of heightened or intense exposures alongside other unwanted outcomes such as disturbance to wellbeing or lack of influence are all important. These appear to dominate the overall perception of the odour impact and the perceived history of the complaint.

2.4. Sources of Odour

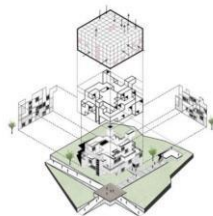
Defining the origin of an odour, as well as recognising common odour sources are all important aspects of defining the problems presented by odours. Odour sources vary greatly in concentration, hedonic tone and quality even for the same source type. The factors which will influence the magnitude of an odour problem associated with commercial kitchen exhausts will be:

- Size of cooking facility – this will influence the intensity of the odour and the volume of air being discharged;
- Type of food being prepared – this affects the chemical constituents within the discharge air;
- Type of cooking appliances used- this dictates the level of fat, water droplets and the temperature within the discharge air.

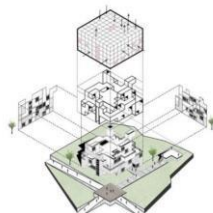


The degree of dispersion, proximity of receptors, size of kitchen and the cooking type will contribute to the odour problem to a greater or lesser degree.

The characteristics of different food types and cooking appliances is given the following table:



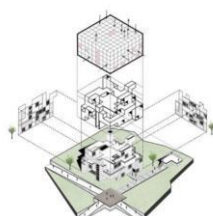
Establishment	Description	Odour Concentration				Grease Content			
		Low	Moderate	High	Very High	Low	Moderate	High	Very High
Tea Shop	-								
Pizza Parlour	Herb								
Steakhouses	Fat								
French	Herbs/garlic								
Italian	Herbs/garlic								
Most Pubs	Fat								
Chinese	Ginger, spice, oil								
Japanese	Spice, oil								
Cantonese	Spice, oil								
Indian	Spice, oil								
Thai	Spice, oil								
Vietnamese	Spice, oil								
Kabab Houses	Fat, cooking meat								
Fried Chicken	Oil, cooking meat								
Pubs (Deep fired food)	Oil, cooking meat								
Fish and chips	Oil								
	Oil, cooking meat								



2.5. Risk Assessment for Odour

Appendix C of the Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems gives a simplified risk assessment. The scoring methodology is suggested as a means of determining if odour control is required in proposed installations.

Criteria	Score	Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction into stack
	Poor	15	Not low level but discharge below eaves or discharge > 10m/s
	Moderate	10	Discharge 1m above eaves or discharge 10 to 15 m/s
	Good	5	Discharge is 1m above ridge at 15 m/s
Proximity of receptors	Close	10	Closest sensitive receptor <20m from kitchen discharge
	Medium	5	Closest sensitive receptor between 20m & 100m from kitchen discharge
	Far	1	Closest sensitive receptor >100m from kitchen discharge
Size of kitchen	Large	5	>100 covers or large takeaway
	Medium	3	>30 to <100 covers or medium takeaway
	Small	1	>30 covers or small take away
Type of kitchen	Very high	10	Pub (deep fried food), fried chicken, burgers, fish and chips, Turkish, Middle eastern or premises cooking with solid fuel
	High	7	Vietnamese, Thai, Chinese, Japanese steakhouse or Indian
	Medium	4	Cantonese, Italian, French, Pizza (GF)
	Low	1	Most pubs, Tea Rooms



Impact	Odour Control requirement	Significance Score
Low to Medium	Low level of odour control	< 20
High	High level of odour control	20 to 35
Very high	Very high level of odour control	>35

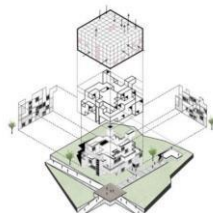
2.6. Odour as a Statutory Nuisance

Nuisances caused by odours are regulated by the relevant provisions within the Environmental Protection Act (EPA) 1990. Section 79(1)(d) of the EPA consolidated various atmospheric pollution that was previously regulated under the Public Health Act 1936. Smell and steam were added to the list of atmospheric pollution. The EPA also imposes a duty on the local authority environmental services to 'inspect' their districts from time to time for statutory nuisances. In addition they have a duty, where ever reasonably practicable, to investigate any complaint made about alleged odour nuisance made by a member of the public / resident.

Like all other statutory nuisances set down in Section 79 EAP 1990 the odour provisions are twolimbed. There is a requirement for the local authority to decide if the odour is prejudicial to health or a nuisance (or both).

Private Nuisance is a continuous, unlawful and indirect interference with the use or enjoyment of land, or of some right over or in connection with land. The emissions would have to interfere, in a material or substantial way, with the victim's use of his property. You take civil proceedings for nuisance ("private nuisance") in the High Court or County Court.

An alternative approach is to follow the statutory nuisance procedure which involves going to the Magistrates Court. This is laid out in the Environmental Protection Act 1990 (sections 79 to 82). It is based on similar principles to private nuisance, but it is intended to enable people to get relatively quick relief through the most local court system. The EPA 1990 provides two routes: one for local authorities to act (often following complaints to them, though also on their own volition), and another which allows people to act directly, without involving the local authority. Under the nuisance limb interference in a person's 'personal comfort' is required. However the standard applied is an objective one so where a particularly sensitive victim experiences as significant interference in their 'personal comfort' which an average person would not, there can be no statutory nuisance.



3. RISK ASSESSMENT AND VERIFICATION SITE VISITS

3.1. Risk Assessment

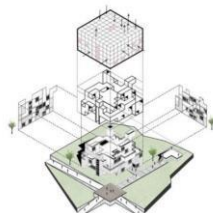
Based upon the methodology set out in Appendix C of Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems we carried out the following risk assessment.

3.2.

Impact		Odour Control requirement		Significance Score		
Low to Medium		Low level of odour control		< 20		
High		High level of odour control		20 to 35		
Very high		Very high level of odour control		>35		
Dispersion		Proximity of receptors	Size of Kitchen	Cooking Type	Total Score	
Main Canopy System		5	1	5	7	18

Verification Site Visit

The risk assessment suggest that **Low to Medium level** of odour usually admitted from type of cuisine named "**Medium Size Indian Prep Warehouse**" in particular for main canopy system. Furthermore, assessing and testing at two different point which are located within the project site determined the odour in the vicinity. The system that will be utilized is sufficient and adequate to neutralize the odour according to our investigation.



4. SYSTEM DESCRIPTION AND RECOMMENDATIONS

4.1. System Description

The proposed kitchen system at 20 Portman Road as per the risk assessment table above is considered be medium in size. All the kitchen equipment are both gas and electric supply. Equipments respectively;

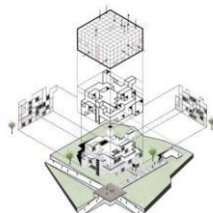
Specific Extract Flow Rate Calculation Sheet						
based on the THERMAL CONVECTION METHOD as recommended in HVCA Specification DW172						
Contract: 20 Portman Road						
Job Number: G8446						
Date: 01/09/2023						
Area: Reading						
Cooking Equipment	Power	Plan Size		Area (m ²)	TCC (m ³ /s/m ²)	Flow Rate (m ³ /s)
		X(m)	Y(m)			
Tandoori Oven, Gas	Gas	0.80	0.80	0.64	0.35	0.22
Tandoori Oven, Gas	Gas	0.80	0.80	0.64	0.35	0.22
Heavy Duty Bratt Pan, Gas	Gas	1.20	0.75	0.90	0.55	0.50
Griddle (chrome), Gas	Gas	0.90	0.75	0.68	0.45	0.30
Chargrill/Charbroiler, Gas	Gas	1.20	0.75	0.90	0.95	0.86
Open Top Range and Oven, Gas	Gas	0.65	0.65	0.42	0.35	0.15
Open Top Range and Oven, Gas	Gas	0.65	0.65	0.42	0.35	0.15
Open Top Range and Oven, Gas	Gas	0.65	0.65	0.42	0.35	0.15
Low/Med Duty Deep Fat Fryer, Gas	Gas	0.45	0.75	0.34	0.45	0.15
Low/Med Duty Deep Fat Fryer, Gas	Gas	0.45	0.75	0.34	0.45	0.15
-						
-						
-						
-						
-						
-						
-						
X Factor for Canopy / Ceiling Type:		Theoretical Flow Rate (m ³ /s)				2.85 m ³ /s
		13. Island Type (open both ends)				1.35
		Specific Extract Flow Rate				3.846 m ³ /s
		Make-up-Air Ratio				85%
		Make-up-Air Flow Rate (m ³ /s)				3.27 m ³ /s

Main Kitchen Cooking Equipments

The above-listed equipment are located under the designated canopy is 5000x2200 mm island extract canopy with integral grease filters for main cooking kitchen.

4.2. Design

All units to be used are designed to prevent odours and oil emissions. This system is designed to prevent odour emissions which may affect neighbours or the surrounding area. If necessary, the system can be improved by supplementing the ozone odour neutralizer healing system.



5.CONCLUSION

The following 'Risk Assessment for Odour' has been derived from criteria outlined by , Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems & EMAQ odour control guidance. The assessment is carried to accurately score the site according to EMAQ standards.

Indian food preparation warehouses are catering establishments that utilize exhaust systems to remove air with low to medium levels of odour emission and grease content. Additionally, a risk assessment score of **18/45** was obtained for the canopy system at 20 Portland Road. This score indicates that the risk level is considered to be **low to medium** according to the table provided below..

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

Low to medium level odour control may include:

1. Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.1 second residence time).
2. Fine filtration followed by counteractant/ neutralising system to achieve the same level of control as point 1.

Carbon and Hepa Filters

The EMAQ+2018 Guide for Risk Assessment of Odour has confirmed that Indian Cuisine has the highest level of odour and grease loading amongst all cuisines. As the cuisine to be offered at 20 Portman Road is very specific, the recommended airflow rate is **3.8 m³/s**, and carbon filters are to be used to achieve a **6 m³/s** airflow rate. This will result in a dwell time of **1.5**, and the recommended system will efficiently reduce odour emissions and grease accumulation within the system. The Carbon use panels of cells to remove the malodours gases within the commercial kitchen extract duct through the process of chemical adsorption.

To meet the criteria of a High-Efficiency Particulate Air (HEPA) filter and the Carbon filters must have the capability to eliminate 99.97% of particles, reaching a sub-micron level, from the air that flows through them. The primary purpose of utilizing HEPA filtration in our system is to effectively remove smoke particles

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



WARNING
Lifting hazard. Single person lift could cause injury. Use mechanical aids, moving or lifting.



Carbon PA242424

Size 594 x 594 x 597
Gross Weight 68.2Kg
Carbon Weight 50Kg
Rated Airflow 3600m³/hr*
Pressure Drop 120Pa

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



Sitesafe PA240824

Size 594 x 196 x 597
Gross Weight 17.95Kg
Carbon Weight 16.6Kg
Rated Airflow 1200m³/hr*
Pressure Drop 120Pa



Sitesafe 3 x PA240824

Size 594 x 594 x 597
Gross Weight 53.85Kg
Carbon Weight 50Kg
Rated Airflow 3600m³/hr*
Pressure Drop 120Pa

Carbon Filter Cell Part Number	Nominal Size (inches)	Height (mm)	Width (mm)	Depth (mm)	Weight of Encased Carbon (Kg)	Weight of Entire Cell (Kg)	Capacity @ 0.1 Second Dwell Time M3/h
PA-240824-7C "Site Safe"	24 x 08 x 24	594	196	597	17	18	1266
PA-242412-7C	24 x 24 x 12	594	594	297	25	36	1900
PA-242424-7C	24 x 24 x 24	594	594	597	50	61	3800

. Carbon Filters Spec Sheet

E10 WEDGE HEPA FILTERS					
Actual Sizes mm			Flow Rate	PD	Part Numbers
H	W	D	m ³ /s	Pa	GWEDGE/E10/C
609	609	292	0.89	200	1510820
609	305	292	0.45	200	1510821

H14 WEDGE HEPA FILTERS					
Actual Sizes mm			Flow Rate	PD	Part Numbers
H	W	D	m ³ /s	Pa	WEDGE/H14/C
609	609	292	0.89	280	1510830
609	305	292	0.44	280	1510831

Table 6. Hepa Filters Spec Sheet

ON 100. ODOUR NEUTRILIZER

Once the airstream in the exhaust duct has had the majority of the particulates removed by one of filtration units the malodour can then be treated by the ON100. The vapour from a specially blended neutralising agent, ELIMINODOR*, is mixed with ambient air drawn into the ON100 and ionised to a negative potential of 15,000 volts. This ionised vapour then passes along a nonconductive tube to be discharged into the centre of the duct via a venturi spigot, the metal ducting is earthed through the same high tension circuit which makes the contaminant at an opposite potential to the negatively charged ELIMINODOR® vapour. This then causes the negative and positive particles to combine, so treating the malodour by chemical reaction.



ON100 ODOUR NEUTRALISER

TECHNICAL SPECIFICATION

	ON100
Supply	220-240 V 50HZ
Power Consumption	40 _w
Ionisation voltage	15 KV negative
Maximum Airflow	4.16 M ³ /SEC (UP TO)
Dimensions (mm)	W 400 H 500 D 200
Weight	12.25 KG (APPROX)

TECHINCAL SPECIFICATION OF ON100-ODOUR NEUTRILISER

ELIMINODOR

This product has been specifically developed and blended for use in Purified Air's ON100 unit. ELIMINODOR® is a finely balanced blend of essential oils and other chemicals which neutralise odorous gases found in the exhausts of commercial kitchens and restaurants. Purified Air have designed this unique system to ensure that only minimal quantities of ELIMINODOR® are required for optimum results. Purified Air's ON100 unit in conjunction with ELIMINODOR® can reduce malodour in your commercial kitchen exhaust by up to 90%.



ELIMINODOR

MAINTENANCE FOR CARBON AND HEPA FILTERS

All maintenance should be carried out in accordance with the planned maintenance set by the installation contractor as set out below and by the Technical and Operations Manual.

All maintenance should be carried out by a trained operative.

When handling any components suitable PPE should be used - gloves, eye protection and access equipment.

Carbon Filters

Frequent deep cleaning of the activated side carbon should be replaced with new activated side carbons every 12 months.

Hepa Filters

Frequent deep cleaning of the activated side carbon should be replaced with new activated side carbons every 12 months.

Bag Filters/Pre Filter

Frequent deep cleaning of the bag filters should be replaced with new filters every 6 months.

ON100

One litter every 4 weeks under normal conditions

Ducts and Fan:

Intervals between kitchen extract cleaning depend on usage. These are minimum recommended intervals according to the HVCA's TR/19 best practice guidance.

A new table provides clear guidance to assist in assessing the requirements for cleaning particularly where cooking methods produce high volumes of airborne grease contaminants.

6.EXECUTIVE SUMMARY

In July, Goya Works was instructed by owner of Saikrish Properties Limited to assess and sorting the proposed kitchen extract system at 20 Portman Road in support of their extraction system planning.

The size of the kitchen can be considered as a medium prep warehouse. The type of Indian Cuisine cooked within the proposed site emits medium amounts of odour in concentration. The exhaust is discharged 1.5m above highest point of building and level at a point that is discharged to the sky vertically.

The system requires 3.8 m3/s air for the system. Therefore, the system was designed to achieve a **0.15 dwell time** rating by Carbon filter site safes when coupled with O.N. 100 for main canopy system. The risk assessment has been undertaken and the score was found to be **18/45 for main canopy system**.

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

Low to medium level odour control may include:

1. Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.1 second residence time).
2. Fine filtration followed by counteractant/neutralising system to achieve the same level of control as point 1.

Based on the conducted tests, the risk assessment score is **low –(18/45)**. Therefore, it is recommended that the system should consist of the following:

- X18 Activated Carbon Filter Site Safe and Hepa Filter
- X1 GBD 710 Multibox, made by Helios
- X1 R02-8-1200 Silencer Attenuation for atmosphere side
- X1 R02-8-900 Silencer Attenuation for kitchen side
- ON 100 with ELIMINODOR

After the implementation of the above equipment, 95% odour will decrease.

In conclusion, the kitchen size is big. The distance of the extract flue, the direction and with additional mitigation with high quality of filters the impact on the neighbours will be very low.