



thespringfieldgroup.net - info@thespringfieldgroup.net

Odour Abatement Risk & Noise Calculation

This is to give additional information to Councils comments from supplied specification

Proposed property:

25 Boswell street
Holborn
London.
WC1N 3BW

Date:

22nd October 2021

Type of Cooking:

Pizza

Grease laden air percentage:

5-10 Percent basically dry warm air

Grease laden air percentage:

Dwell time category Low 0.1 to 0.2 seconds

Dispersion of the discharge cowl risk assessment

<i>Low-level discharge, discharging to courtyard or restriction on stack</i>	<i>Very poor</i>	<i>20</i>	
<i>Not low-level but below eaves, or discharge of below 10 M/S</i>	<i>Poor</i>	<i>15</i>	
<i>Discharging 1m above eaves 10 to 15 M/S</i>	<i>Moderate</i>	<i>10</i>	<i>10</i>
<i>Discharging 1M above ridge 15 M/S</i>	<i>Good</i>	<i>5</i>	

Proximity of receptors

<i>Close sensitive receptor less than 20metres kitchen discharge</i>	<i>Close</i>	<i>10</i>	
<i>Close sensitive receptor between 20 to 100 metres from kitchen discharge</i>	<i>Medium</i>	<i>5</i>	<i>5</i>
<i>Close sensitive receptor more than 100metres from kitchen discharge</i>	<i>Far</i>	<i>1</i>	

Kitchen size

<i>More than 100 covers a large size takeaway</i>	<i>Large</i>	<i>5</i>	
<i>Between 30 and 100 covers or medium sized takeaway</i>	<i>Medium</i>	<i>3</i>	<i>3</i>
<i>Less than 30 covers or small takeaway</i>	<i>Small</i>	<i>1</i>	

Type of Cooking Odour & grease loading

<i>Pub (high level of fried food), fried chicken, burgers or fish and chips</i>	<i>Very high</i>	<i>10</i>	
<i>Kebab, Vietnamese, Thai or Indian</i>	<i>High</i>	<i>7</i>	
<i>Cantonese, Japanese or Chinese</i>	<i>Medium</i>	<i>4</i>	
<i>Most pubs, Italian, French, pizza, or steakhouse</i>	<i>Low</i>	<i>1</i>	<i>1</i>

<i>Based on</i>	<i>Total Score</i>	<i>Medium</i>	<i>18</i>
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<i>Impact Risk</i>	<i>Odour Control Requirement</i>	<i>Significance Score</i>	
<i>Low to Medium</i>	<i>Low level odour control</i>	<i>Less than 20</i>	<i>18</i>
<i>High</i>	<i>High level odour control</i>	<i>20 to 35</i>	
<i>Very High</i>	<i>Very high level odour control</i>	<i>more than 35</i>	

In order to supply the required odour abatement system, we look at space, location and system resistance of the system to maintain the correct canopy face velocity.

Odour arrestment plant performance

Low to medium level control may include:

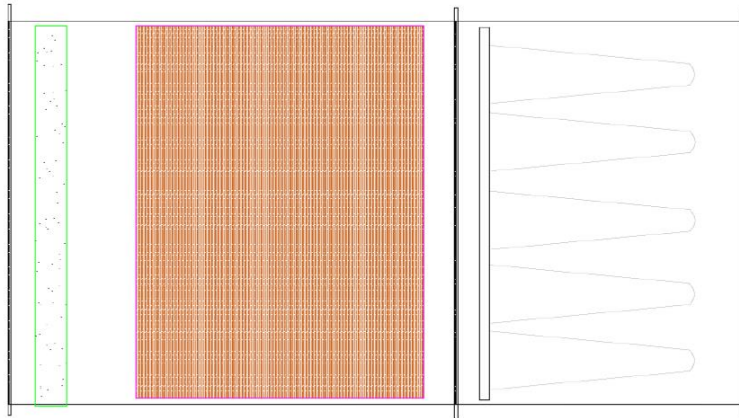
1. Fine filtration or ESP following by carbon filtration (carbon filters rated with a 0.1 second residence time).

Our specification states we would install a Electrostatic precipitator and activated carbon filter, the ESP takes out any smoke laden air and the carbon neutralises the odour. Due to the nature of the air being basically dry smoke free air, we could change the system to a secondary fine filtration system.

Stage 1: Fine V-Pleat synthetic filter to filter any grease droplets entering the activated carbon filter.

Stage 2: Activated carbon filter.

Stage 3: Carbon impregnated bag filter to neutralise any carry over from the carbon.



With this cooking method of basically hot bread fume air and discharging at very high level we feel this would be efficient enough to neutralise any odour emanating from the premises.

If internal space is limited we could install a Ultra violet ozone filter, see attached information sheet, installation of a pre-filter box and then the ozone filter within the premises.





C3 CONTROLLED
OZONE
PRODUCTS
OZONE INJECTOR UNIT

The Safe Intelligent Way to Harness the Benefits of Ozone to Control Cooking Odours

Ozone has long been recognised as a very effective medium for the neutralising of cooking odours and injection into the kitchen extraction system has proven to be effective in the control of odour

emissions, however, ozone emissions must be within safe levels. Working within the accepted industry guidelines of 1 gram per 0.09 m³s of air volume @ 1.5 seconds of dwell time within the ducts, to achieve neutralisation of 80% of cooking odours and maximum

discharge levels of 0.3 ppm ozone concentration, the Controlled Ozone products are designed to be the first fully controllable, energy efficient, future proof units developed to reduce cooking odour emissions.

The monitoring processes of the CoRange start with the production levels of ozone being controlled via an electronic air-pressure sensor within the control panel, which controls the concentration ratio of air/ozone in the extract ducts. To ensure the correct concentration the CoRange Injector will increase its output of ozone by 10 grams per every 1 m³s of air volume within the duct.

Should ozone emissions from the extract system exceed permitted levels a second stage of control via a discharge monitor situated at the end of the extract duct is an optional addition, this monitor is factory set at 0.3 ppm of ozone to comply with HSE guidelines for discharge to atmosphere within 10 metres of the closest habituated premise.



C3 CONTROLLED
OZONE
PRODUCTS

SYSTEM BENEFITS

- 0 Fully controllable by information gathered from both electronic air pressure switch and if required by ozone monitor
- 0 Will deliver correct concentration of ozone from 0.8 to 8 m³/s of air flow
- 0 Delivers low dwell times as it can inject active ozone into the system at the earliest possible opportunity
- 0 Will not exceed permitted ozone discharge levels
- 0 Can deliver ozone to multiple points within the extraction system to suit requirements ie. Plenum, ducts either before or after fans and inline filtration
- 0 Easy to install
- 0 Additional injectors can be added to the system easily
- 0 Only uses power when it is required
- 0 Control Panel can be sited away from injectors - in a position that is easy to view
- 0 Outputs for Building Management Systems and Data loggers
- 0 Two years warranty



C3 CONTROLLED
OZONE
PRODUCTS

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Springfield Group
PRODUCTS

TYPICAL SYSTEM & ORDER CODES

The BMS System comprises of 1 off BMS\VM Control Panel and between 1 and 4 BMS Injectors to match the demands of the extraction system.

The level of Ozone being called off is indicated by the LED bulbs illuminated on the control panel.

for example, with LED A and B on Injector 1 delivery is 20grams; LEDs up to A on Injectors 3 = 50grams etc.

To ensure that the levels of ozone being discharged are within guidelines the Co515 Monitor will cut the ozone production by 10g of ozone at a time until the monitor registers the desired ppm concentration of ozone at discharge.

Injector 1 on its own

A) Up to 1 m /s the ozone delivery is 10 Grams
B) Up to 2 m /s the ozone delivery is 20 Grams

Injectors 1 and 2 on

A) Up to 3 m /s the ozone delivery is 30 Grams
B) Up to 4 m /s the ozone delivery is 40 Grams

Injectors 1, 2 and 3 on

A) Up to 5 m /s the ozone delivery is 50 Grams
B) Up to 6 m /s the ozone delivery is 60 Grams

Injectors 1, 2, 3 and 4 on

A) Up to 7 m /s the ozone delivery is 70 Grams
B) Up to 8 m /s the ozone delivery is 80 Grams

BMS-OZINJ



BMS Ozone Injector
150 x 150 x 330 mm Stainless Steel Case
2 x 10 Gram per Hour Gaseous Ozone Reactors 1 x 5 Pin
1 x Power on Indicator Lamp
1 x Ozone Production Lamp

BMS-OM



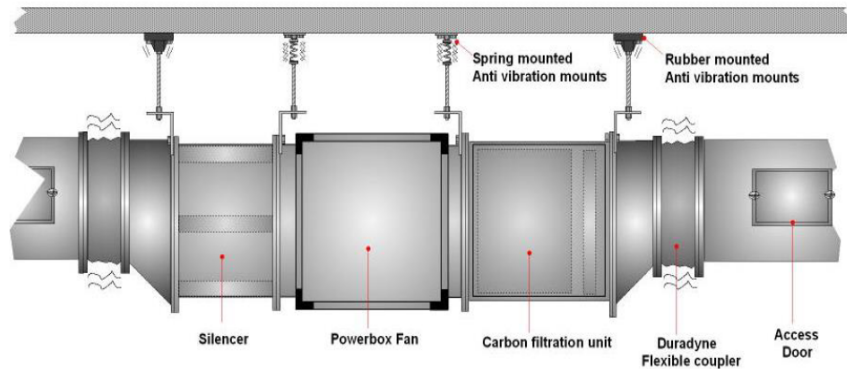
Ozone Monitor
155 x 200 x 95 mm
1 x Power on Indicator Lamp
1 x Monitoring Indicator Lamp
1 x Dwell Indicator Lamp

BMS-CP



BMS / VM Control Panel
155 x 200 x 95 mm
LED Indicator Lamps
Electronic Air Pressure Sensor
4 x 5 pin Monitor Output Sockets
1 x 5 Pin BMS Output Socket
1 x 5 Pin Data Logger Output Socket

Noise Calculation



Typical fan system mounted internally on spring mounted and rubber anti vibration mounts to stop noise reverberating through the ceiling. With the fan mounted internally very little migratory noise is Emitted.

The fan has a breakout noise of 53 decibels and a induct noise of 68 decibels, with the silencer the induct noise will reduce to 56 decibels, to reduce noise further we could install a extra 1000mm long silencer to reduce further reduce by 14 decibels and with the distance factor as below the noise at the discharge cowl would be 38 decibels. We would estimate the migrated noise within this development of being 55-60 decibels.

We work our calculations usually to Comply with London Borough of Islington and other Council's borough acoustic requirements. • London Borough of Islington Council's requirement, applicable to this site, is that the rating level of the new plant shall be designed to a level at least 5dBA below the prevailing background sound level at 1m outside windows of the nearest affected noise-sensitive property, when assessed in accordance with procedures set out in British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound. • Results of the sound level survey show that the specific sound level of the new plant is above the prevailing residual sound level. This corresponds to the subjective opinion of the author, that the equipment was subjectively audible at the window of the nearest residential property. • In order to mitigate noise from the unit it is recommended that acoustic mitigation is installed, in order to ensure the rating level from the unit achieves at least 5dB below the prevailing background sound level. This will ensure the unit achieves London Borough of Islington Council's acoustic criteria, and will prevent loss of amenity to nearby residential occupants

Distance

Every time the distance from the source is doubled, the noise level is reduced by 6 Db

(A 6-decibel reduction is defined as "clearly noticeable".) Note: You must double the total distance, not the original distance, to achieve additional 6 dB reductions. For example:

Distance from the source	Noise Level Reduction
6 metres	- 3 dB
12 metres	- 6 dB
24 metres	- 12 dB

Note: The 6 metres selected is arbitrary starting distance.

Noise level the source	68 dba
Silencer reduction after fan	-12 dba
Distance factor from source to exhaust cowl 19 metres	- 9 dba
Total noise level at 3 metres from discharge cowl	45dba

With additional silencer if required noise reduced to 31 Decibels at the discharge cowl, induct velocity 10 M/sec efflux dilution and velocity noise to a minimum.