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EFDC Commercial Kitchens Systems Guidance Note & Risk Assessment

The aim of any ventilation/extraction is to ensure that no nuisance, disturbance, or loss of amenity is caused by odour, fumes, food droplets or noise, to adjoining properties and the general environment. Additionally, the impact of the flue to the character and appearance of the area is equally as important.

A competent person with specialist knowledge of ventilation schemes should undertake the design and installation of a ventilation system. Designing and installing appropriate ventilation systems may involve considerable expense. The design of your proposed system should meet the appropriate standard specified in the EMAQ+ document - “Control of Odour and Noise from Kitchen Exhaust Systems” 2022 (or equivalent if replaced).

In circumstances where the end user of the premises is unknown, or where the specific type of food to be cooked is unknown, the installation should be designed to achieve the highest level of odour control in order to cater for a worst-case scenario.

Please note that there are many different types of odour abatement available (carbon filters, electrostatic precipitation, high dilution, and high velocity extraction) not all types are suitable for all cooking methods. In each case, grease filters must be installed. Please note that any reference to minimum standards within this document is for guidance only and more stringent controls may be deemed appropriate.

To enable the Council to assess the suitability of a ventilation/extraction scheme the following information should be provided along with the risk assessment attached to the end of this document.

Type	Details Required	Comments
Information on premises	Please provide the following information in the next column; • the types of meals to be served, e.g., fish and chips, Chinese food, Indian food, pizzas, or Italian dishes, etc; • the number of meals to be served per day; • the method(s) of preparation and cooking; and • proposed hours of operation of the business.	

Plans and drawings	Provide a scaled plan showing the internal arrangement of the premises and the dimensions/location of the extraction/ventilation system. The plan must contain external elevations of the buildings showing the; • dimensions; • route; and • exhaust characteristics (i.e., appearance) of the ductwork in relation to the building. The location of all filters and the fan must be clearly marked. Where the location of a filter is shown the type must be clearly identified and cross-referenced to the detailed product specification.	To be attached to this checklist.
Pre-filters	A copy of the manufacturer's product data sheet should be supplied clearly showing: • manufacturer's name; • filter name and product code; • dimensions of the pre-filter; • nature of the filter media; and • manufacturer's recommendations on the frequency and type of maintenance of the pre-filter having regard to the conditions that it will be used under.	To be attached to this checklist.
Electrostatic precipitators (where proposed)	A copy of the manufacturer's product data sheet should be supplied clearly showing: • manufacturer's name; • ESP name and product code; • dimensions of the ESP; • flow rate rating; and • Manufacturer's recommendation on the frequency and type of maintenance of the ESP having regard to the conditions that it will be used under.	To be attached to this checklist.

Carbon Filters (where proposed)	Please provide the following information in the next column: • the details and type of carbon filter units should be identified. • the nature of the carbon (including product type); • the frequency of replacement of the carbon units having regard to the conditions that it will be used under. The assumptions to this calculation must be clearly stated, including the frequency and duration of use. The manufacturer should provide recommendations on the frequency and type of maintenance required; • total volume of carbon expressed in cubic metres; • total mass of carbon expressed in kilograms; • total surface area of the panels exposed to the exhausted air; and • dwell time of the gases in the filter compartment and the control setting at which this is achieved. The assumptions to this calculation must be clearly stated and should include the air change rate for the setting quoted. A copy of the manufacturer's product data sheet should also be attached to this checklist that clearly shows: • manufacturer's name; • filter name and product code; • dimensions of the filter panel; and • the total number of filter panels in the filter bed.	
Odour counteractant or neutralising system (where proposed)	The details and type of counteractant or neutralising system should be identified. A copy of the manufacturer's product data sheet should be supplied that clearly shows: • manufacturer's name; • name of delivery system and product code; • counteractant or neutralising chemical to be used; • COSHH data sheets for chemical to be used; and • anticipated counteractant or neutralising delivery rate.	To be attached to this checklist.

UV System (where proposed)	A copy of the manufacturer's product data sheet should be supplied that clearly shows: • Manufacturer's name • UV system name and product code • Dimensions of the UV unit • Anticipated level of ozone being generated • Anticipated residence time • Anticipated level of residual ozone likely at stack exit • Manufacturer's recommendation on the frequency and type of maintenance the UV having regard to the conditions that it will be used under	To be attached to this checklist.
Cooker hood	Please provide the following information on the characteristics of the cooker hood in the next column or indicate where this information can be found. It should show the; • length that the cooker hood overhangs the appliances; • face velocity at the cooker hood, expressed in metres per second; and • dimensions of the opening of the cooker hood.	
System Operation	Please provide the following about the system in the next column: • extract rate (expressed as m3/s) at the proposed rate of extract; • dwell time of the gases in the carbon filtration zone; • volume of the kitchen; and • efflux velocity Note: The system performance is dependent upon the extract rate of the air. Where the rate can be adjusted by the use of dampers or a variable speed fan, then the conditions under which the extract rate can be achieved must be described.	

Flue Design	The height and velocity of the final discharge are the two important factors. Generally, the greater the flue height, the better the dispersion and dilution of odours. The discharge of air should be at a minimum height of 1m above the roof ridge, especially if there are buildings nearby that may affect odour dispersion and dilution, although consideration will need to be given to the impact on the character and appearance of the area. Where this is not possible (e.g., because of ownership or structural constraints), additional techniques will be required in order to reduce odours, such as an increase in efflux velocity and additional filters, etc. The final discharge should be vertically upwards, unimpeded by flue terminals. The number of bends in the ducting should be minimised and the ducting should have a smooth internal surface.	To be attached to this checklist.
Noise Levels	Data on the noise produced by the system as a whole should be provided including: • sound power levels or sound pressure levels at given distances (the assumptions to this calculation must be clearly stated); • an octave band analysis of the noise produced by the system should also be provided, where possible; and • hours of operation of the ventilation system (where this differs from the hours of opening).	To be attached to this checklist.
Maintenance	A schedule of maintenance must be provided including details for: • cleaning of washable grease filters; • frequency of inspection and replacement of all filters (grease filters, pre-filters, and carbon filters where proposed); • inspection and servicing of fans; and • if schedule is not based on manufacturer's instructions include the reasons why.	To be attached to this checklist.

Additional notes for guidance	Please provide the following information in the next column or indicate where this can be found; The air inlets must not permit pests to enter the kitchen. Fly screens are an example of how this can be achieved. Sufficient air must be permitted into the premises to replace air extracted. The method for supplying this make-up air should be detailed. The route of the air into the kitchen must not result in its contamination, for example passage through a toilet. Separate provision must be made for ventilation of a toilet. There must be sufficient access points to permit adequate cleaning of all the ductwork.	

Risk Assessment for Odour:

You are strongly advised to refer to the following document EMAQ Control of Odour and Noise from Kitchen Exhaust Systems 2022 (or equivalent if replaced)

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.

Please also review the odour arrestment plant performance 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

**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 10m/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. Turkish, Middle Eastern **or any premises cooking with solid fuel**
	High	7	Vietnamese, Thai, Indian, Japanese, Chinese, steakhouse
	Medium	4	Cantonese, Italian, French, Pizza (gas fired)
	Low	1	Most pubs, (no fried food, mainly reheating and sandwiches etc), Tea rooms

Based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type, a low to medium/high/very high [please delete as appropriate] level of odour control is required.

Odour Arrestment Plant Performance:

Low to medium level 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 1.

High level odour control may include:

1. Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.2 – 0.4 Second residence time).

2. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

Very high level of odour control may include:

1. Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.4 – 0.8 Second residence time).

2. Fine filtration followed by carbon filtration and by counteractant/neutralising system to achieve the same level of control as 1.

3. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

In some instances where very high levels of control are required combinations or sacrificial levels of filtration may be employed.

Maintenance must be carried out to ensure these performance levels are always achieved.