

The ventilation system

20 Portman Road

Reading

RG30 1EA

KITCHEN EXTRACTION INFORMATION

The system to be installed will be designed as per document: EMAQ – Control of Odour and Noise from Commercial Kitchen Exhaust Systems, 2018 (1) , a best practice guide for the design and operation of commercial kitchen ventilation systems.

The following details will be followed for the design of the system.

Minimum Ventilation Rates

- An internal ambient air temperature of 28°C maximum
- Maximum humidity levels of 70%
- Internal noise level should be between NR40 – NR50
- Dedicated make up air system to be approximately 85% of the extract flow rate
- Minimum air change rate of 40 per hour (bases on canopy and general room extraction)

Minimum Requirements for Canopy

Velocity requirements:

- Light loading – 0.25 m/s (applies to steaming ovens, boiling pans, bain maries and stock pot stoves)
- Medium loading – 0.35 m/s (applies to deep fat fryers, bratt pans solid and open top ranges and griddles)
- Heavy loading – 0.5 m/s (applies to chargrills, mesquite and specialist broiler units)

Sizing:

- Ideally, the plan dimensions of the canopy shall always exceed the plan dimensions of the catering equipment by a minimum of 250 mm on each free side
- This should be increased to 600 mm in front of combination steaming ovens to cope with the steam or fumes released when the doors of the appliance are opened. Solid fuel appliances must have an overhang of 300 mm from the door open position

Materials:

- A material that would comply with the food hygiene requirement is stainless steel

Grease Separation:

- The grease extracted by the separators shall be collected and removed so that it will not accumulate in either the canopy plenum or the ductwork system, or fall back onto the cooking surface
- The separator shall be constructed so that there are no sharp edges or projections and shall be easily removable for regular cleaning
- Primary filters that retain grease within the filtration matrix until cleaned, shall not be used

Minimum Requirements for Duct Work

- All duct work should be Low Pressure Class 'A' and constructed in accordance with BESA Specification DW/144 with a minimum thickness of 0.8 mm

- Duct velocities should be as follows:

Supply (m/s) Extract (m/s)

Main runs 6 – 8 6 – 9

Branch runs 4 – 6 5 – 7

Spigots 3 – 5 5 – 7

- All internal surfaces of the ductwork should be accessible for cleaning and inspection. Access panels should be installed at 2.0 m centres and should be grease tight using a heat proof gasket or sealant
- Duct work should not pass through fire barriers
- Where it is not possible to immediately discharge the captured air, fire rated duct work may be required

Minimum Requirements for Fans

Fans should be selected to handle the design resistance with an additional 10% airflow and 20% pressure margin allowed to suit possible extensions to the original kitchen plan.

Backward curved centrifugal, mixed flow or axial flow impellers are preferred as they are less prone to unbalance and are more easily maintained and cleaned due to their open construction. Fixed or adjustable metal impellers with a robust and open construction shall be used,

Care shall always be taken with the location of the supply and extract fans to ensure that there is sufficient space for regular cleaning and maintenance. Limited space shall not restrict selection of the correct fan.

Drain holes should be fitted.

For fans serving canopies above solid fuel burning appliances, the motor must be out of the airstream and impellers must have metal blades.

Minimum Requirements for Odour Control

- for new premises or premises covered by planning conditions restricting the impact of odour the system shall be designed to prevent harm to the amenity.
- for existing premises not covered by planning conditions restricting the impact of odour, the system shall be designed to avoid statutory nuisance and shall comply with the principles of Best Practical Means.
- The design of a control system should recognise that there are two phases of contamination in a kitchen exhaust; particulate (grease, smoke, hydrocarbons/VOC) and gaseous (odour). The particulate phase needs to be removed prior to dealing with the gaseous phase.

To achieve these objectives the odour control system shall include an adequate level of:

1. Particulate and odour control; and
2. stack dispersion.

The overall performance of the odour abatement system will represent a balance of 1 and 2.

Discharge stack

The discharge stack shall:

1. Discharge the extracted air not less than 1 m above the roof ridge of any building within 15 m of the vent serving the commercial kitchen. Additional odour control measures may still be required depending on the cooking type and frequency.

Odour arrestment plant performance

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.

Minimum Requirements for Noise Control

To achieve these objectives the noise control system shall include:

- control of noise at source to the greatest extent possible; and
- control of noise to the environment by taking acoustic considerations into account within duct, grille and termination design

The control system should meet the requirements laid down in BS4142: 2014 “Method for Rating and assessing industrial and commercial sound” or local standards where they exist (whichever is more appropriate).

Where in-line attenuators are used they shall be constructed so that there is no grease impregnation into the acoustic media. A protective membrane shall be specified for this purpose or this will reduce the design performance of the attenuator. This should be taken into account when selection is made.

It may be necessary to apply additional acoustic controls such as in line silencer or splitter attenuator after grease removal stages. Care should be taken to ensure that all such elements are capable of being accessed for cleansing purposes

Maintenance

The recommended cleaning period for grease extract system ductwork is:

Grease loading Daily usages Cleaning interval (months)

Heavy use Heavy/continuous grease production 6 – 12 hours

12 -16 hours

3-6 months

2-3 months

Recommendations for maintenance of odour control system include:

- System employing fine filtration and carbon filtration
 - o Change fine filters every two weeks
 - o Change carbon filters every 4 to 6 months
- Use a system employing ESP and other in line abatement, typically
 - o ESP systems cleaned, and sump emptied on a four weekly basis.
 - o UV-C systems used in line, cleaned on a four weekly basis
 - o Side Stream UV-C systems, cleaned every 3 to 6 months.
 - o Carbon filters with ESP pre-treatment change carbon filter every 6 to 12 months.

These time frames may increase or reduce for extreme or very light applications

These criteria's will be followed in the design of the extraction system, to ensure compliance with the EMAQ document.