FOOD SAFETY I FACT SHEET
Ventilation of Food Premises

Food Safety Standard 3.2.3 under the Food Standard Code contains the design and construction requirements for food premises.

A component of the requirements is that food premises be provided with natural or mechanical ventilation to minimise the likelihood of airborne contamination of food and provide a safe working environment by effectively removing fumes, smoke, steam and vapours.

The term 'ventilation' in the context of food premises includes providing sufficient fresh air by natural or mechanical means to the dining area/s (if appropriate) and kitchen for the benefit of both staff and customers.

The purpose of this fact sheet is to provide an explanation to existing and prospective business operators of the minimum requirements relating to the ventilation of food premises with particular emphasis on commercial exhaust/canopy hoods under Australian Standard 1668, Parts 1 and 2.

The need for supply and/or exhaust ventilation and whether that ventilation is provided by natural (windows openings etc) or mechanical means will vary for each business depending on the particular building and the location of the food preparation area, kitchen / or dining area.

Natural Ventilation

The term *natural ventilation* generally refers to fresh air supplied or introduced into a business from an acceptable external source such as windows, doors or vents.

Depending on the location of the dining area/s and/or kitchen, it may not be possible to provide natural ventilation via window/s.

In such cases mechanical supply ventilation may be required. In those circumstances where it is possible to provide natural ventilation to a dining area and/or kitchen, the Building Code of Australia (BCA) requires that 5% of the floor area of the room contain window/s, door/s, louvres or other ventilation device/s.

It should be noted that the BCA does provide for natural ventilation to be "borrowed" from an adjoining room and it is recommended that further detailed investigation of the requirement of the BCA should be made by an applicant.

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Mechanical Ventilation

The term mechanical ventilation in the context of food premises can refer to a mechanical supply system or a mechanical exhaust system or both.

Reliance on natural ventilation to remove fumes vapours, smoke and steam is of limited benefit and hence the reliance on an Australian Standard (AS1668) containing, among other important requirements, the minimum specifications for commercial exhaust ventilation systems in food premises.

Mechanical ventilation relies on the exhaust/canopy hood, grease filters, fan and ductwork to convey fumes, smoke and other aerosols to an acceptable external location to ensure that the grease-laden air, which is to be discharged, is not impacting or nearby residents or businesses.

New Premises

Architects, shop fitters, trades people or business operators contemplating the fit out of a new food premises, in addition to the requirement outlined in Australian Standard 4674-2004 need to be aware of the requirements of the Building Code of Australia and Australian Standard 1668.

It is important that the requirements for natural and/or mechanical ventilation need to be incorporated into the design plans for a new business.

Existing Premises

Just as for new premises, the thresholds contained in AS 1668 apply, that is, gas and electrical cooking appliances over 8 Kw and 29 megajoules/hour respectively are likely to require a mechanical exhaust ventilation system particularly, if there is evidence of grease on surfaces such as walls, ceiling, power points and/or equipment.

The location and type of cooking equipment is an aspect you will need to consider if contemplating changing or adding to your existing cooking capacity. This is particularly important given that installing an exhaust hood and ductwork can be both costly and difficult depending on the space constraint within a building.

Council's environmental health officer can provide assistance, if required, in regard to enquiries about the need for mechanical ventilation in either new or existing premises.

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The following is a brief summary of some of the pertinent requirements of AS 1668:

An applicant for approval should not rely solely on the information provided but should make their own enquiries to satisfy the minimum requirements of the Australian Standard.

When is mechanical exhaust ventilation required?

In general terms, cooking appliances exceeding 8 Kw of electrical power or 29 megajoules of gas are required to be provided with a commercial exhaust ventilation system.

How do I know if an appliance is greater than 8 Kw or 29 megajoules?

Most appliances have a small compliance plate attached to an external surface of the appliance, which contains the rating, or alternatively the manufacturer's specification or brochure will contain the relevant information.

Will a mechanical supply and exhaust system be required?

If natural ventilation cannot be provided by way of a window/s or door or some other means, mechanical supply system will be required. This occurs from time to time with internal kitchens.

In such cases, the mechanical supply system should be filtered and drawn from an approved external source. To enable both the supply and exhaust systems to function correctly, the system should be electrically interlocked and an airflow balance created between to the two systems to ensure a negative pressure that is slightly more air that is exhausted, than supplied.

Do plans need to be submitted to Council or Private Certifier and approval obtained for a mechanical exhaust ventilation system?

Yes, the plans should indicate the relevant aspect outlined in AS 1668.2 including the discharge vent location and the noise rating of the fan/s and motor/s.

A mechanical ventilation engineer or other suitably qualified and experienced professional is required to design the system and the installation is to be carried out by a suitably qualified trade person. The system installed must be certified by the designer that it is in accordance with A.S 1668 on completion of the work and air flow measurements of the system submitted to Council.

Do some forms of cooking generate more greasy emissions than others?

Yes, some forms of cooking do generate more grease and aerosols than others. For example, charcoal chicken cooking or cooking which involves a flame cooking appliance or a hot plate or, in some cases, tandoori oven cooking do have the potential to generate excessive grease laden air which can pose additional cleaning requirements within the kitchen and exhaust hood filters and ductwork as well as generating potential odour concern to neighbours.

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How much air should be exhausted and where can it be discharged?

The quantity of air to be exhausted will depend on a number of factors including the type of cooking the location and size of the exhaust hood. That is, the larger the hood, the larger the air volume to be removed, which in turn determines the size of ductwork, fan, motor etc.

Advice can be obtained from an experienced mechanical engineer or by securing a copy of AS 1668 from Standards Australia.

The air should be discharged in a vertical direction above roof level where no nuisance will be caused to adjoining properties. As a guide, a minimum distance of 6 metres from any window or fresh air intake is considered acceptable.

There is some discretion for a regulatory authority (Council) to approve mechanical exhaust ventilation discharge outlets being located below the roof level.

Exhaust air quantities of less than 1,000 litres/sec may be discharged below roof level subject to certain conditions relating to minimising the potential for impact on adjoining properties. This concession may involve the installation of an additional method of filtration.

What are the other important aspects of an exhaust system?

From a construction perspective, the hood shall consist of rigid hard faced non-combustible material such as steel or stainless steel with joints welded, soldered or otherwise sealed in an approved manner.

For fire safety reasons, the distance between the cooking surface and the bottom edge of the grease filter will vary depending on the intensity of the type of cooking. For example, the distance will vary from 1,350mm for charcoal cooking and open fires to 1,050mm for naked flames from a gas stove, through to 600mm for a deep fryer or hot plate.

The lowest edge of the exhaust hood shall be 2m above floor level and the hood shall have a grease gutter 50mm wide and 25mm deep around the perimeter.

The exhaust hood is required to overhang the perimeter of the cooking equipment by at least 150mm.

Filters are required to be at an angle of 30^{o} to the vertical and their composition and holding frames shall comply with the relevant Australian Standards.

Any light fittings within the hood shall be flush with the internal surfaces/s of the hood.

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Why is noise an issue with mechanical ventilation systems?

A mechanical ventilation system has the potential to generate noise because its components include a fan, motor and other parts, in some cases, such as belts and bearings which can impact on the adjoining neighbourhood.

It is important that the issue of noise generation be given serious consideration at the planning and installation stages of any new development. In some cases the Council may ask for a noise assessment report from an appropriately qualified acoustic consultant being submitted at the application stage.

Existing mechanical ventilation systems, as with any mechanical appliance, require regular maintenance to prevent inevitable wear and tear and minimise the potential for costly repairs and noise generation, which may warrant involvement with the Council.

Cleaning and Maintenance

An important aspect of any mechanical ventilation exhaust system is routine cleaning. Firstly, to ensure that premises are maintained in a clean condition from a general hygiene perspective and to minimise the potential for vermin or odour/s, and secondly, from the aspect of fire safety.

The frequency of cleaning of the various components of the system will vary from business to business depending on the type and regularity of cooking.

The business cleaning schedule should include the various components of a ventilating exhaust system, including the following:-

- The internal and external surface of the canopy hood.
- The exhaust filters.
- The condensation gutter.
- Any light fittings.
- The void behind the filters.
- The internal surfaces or horizontal and vertical ductwork.

While some of the above can be cleaned by the business operator/s and/or staff, some of the more difficult areas to access should be cleaned by specialist trades people.

These specialist areas include the internal surfaces of the horizontal and vertical ductwork, which need to be cleaned at regular intervals for both fire safety and hygiene reasons. The frequency of cleaning will depend on the type and quantity of cooking, for example, what is commonly referred to as charcoal chicken cooking requires significantly more regular cleaning than conventional cooking.