A Guide to Mechanical Ventilation

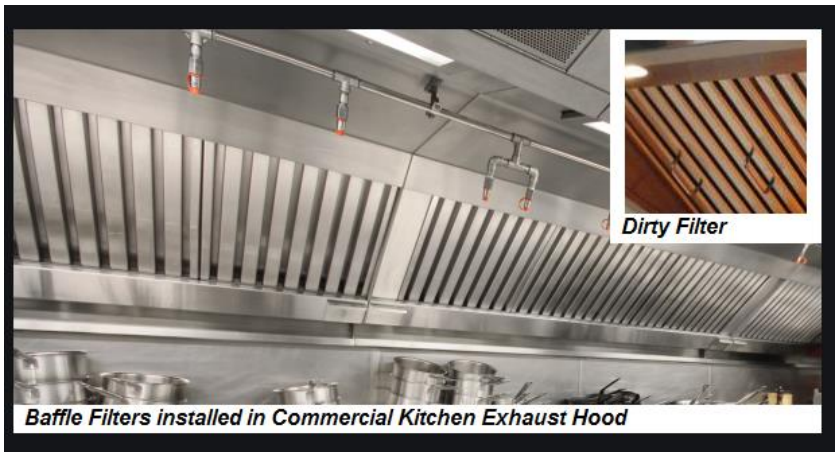
Mechanical ventilation extraction units are generally required to be installed for cooking and dishwashing equipment that heats air (with or without water or grease vapour) in all food business premises.

Extraction units are intended to collect heat and remove fumes and other aerosols arising from cooking and dishwashing equipment as per the requirements listed in Australian Standards 1668 (AS 1668) and associated parts thereof.

Certification

Mechanical ventilation units must be designed, constructed, installed, tested and certified in accordance with the provisions of **AS/NZS 1668.1:2015 and AS/NZS 1668.2:2012**.

A "Form 16" must be provided to you post installation and testing and you must make this available to Council as it will form an integral part of the Food Business Licence approval process. The standard describes the necessity for mandatory testing and maintenance of installed systems to ensure functionality.



Baffle Filters installed in Commercial Kitchen Exhaust Hood

Taking over an existing premises

All existing food premises are required to comply with AS 1668 and the parts thereof, just like new food premises. Therefore, if there is evidence that the current system is not working effectively, such as discolouration or grease on surrounding surfaces, you may be directed by an Environmental Health Officer to cause the system to be certified as being complaint with AS 1668 and, where a system does not comply with the Standard, replace the system with one that complies.

It is important to note that if the premises changes ownership and a new food licence application is submitted, the existing premises is required to meet the current standards in place at the time.

What are the triggers that would result in the need for mechanical ventilation?

- Maximum input exceeding 8kW for electrical appliances, or
- Total gas input of 29MJ/h for gas appliances, or
- Any deep fryer appliance, or
- When more than one item of apparatus in a room has a total power input exceeding 0.5kW/m^2 (electrical appliances) or 1.8MJ/m^2 (gas appliances) of floor area of the enclosure (an individual room, space, or part thereof).

Types of cooking processes

Type 1	Non-grease producing equipment (e.g. dishwasher).
Type 2	Low-grease, medium-heat producing equipment (e.g. griddles, ranges, conventional fryers, tilting skillets, steam kettles and gas ovens).
Type 3	High-grease, low-heat producing equipment (e.g. electric deep-fat fryers, grooved griddles, hot tops and hot top ranges).
Type 4	High-grease, medium-heat producing equipment (e.g. countertop barbeques and gas fired deep-fat fryers).
Type 5	High-grease, high-heat producing equipment (e.g. salamanders and open flame charcoal equipment using solid fuel).
Type 6	Oriental cooking tables and/or woks.
Type 7	Bread ovens and steam producing combination (combi) ovens.

Other considerations

- The length of the hood shall not be less than the length of the kitchen appliance.
- Hoods serving non-grease producing equipment (e.g. dishwashers - type 1 cooking process) do not require grease filtration. Hood flow rate velocity is to be not less than 0.3m/s.
- Stand-alone cooking devices (e.g. pizza ovens and combi ovens) require hood overhang to extend at least 300mm beyond the opening of the cooking equipment, except where equipment has front mounted doors in which case the overhang must be at least 450mm.
- All hoods and associated exhaust systems for use over charcoal and solid fuel appliances shall be provided with separate systems and shall not be combined with a system serving grease or oil heating appliances.

Calculating airflow

AS 1668.2:2012 'Mechanical Ventilation in Buildings' provides a prescriptive procedure that your hood designer will utilise when calculating the air flow requirements of your mechanical ventilation unit.

When equipment is used for more than one cooking process, calculations are always based on the worst case scenario, (e.g. where a type 4 cooking process is located under the same unit as a type 2 cooking process, calculations are based on the type 4 cooking process). The calculated airflow rate should never be less than 250L/s/m^2.

Air flow discharges

Exhausted air should be discharged in a manner that does not cause a nuisance or pose any danger to the building occupants, occupants of neighbouring buildings or members of the public.

Where discharges are deemed objectionable (e.g. odours from cooking activities), the effluent discharge rate should exceed 1000L/s. Refer to AS 1668 for further specifications.

Domestic extraction units

Generally, domestic grade extraction units do not meet the commercial/technical requirements as stipulated in the Standard. If you think your particular situation does not warrant a certified unit (e.g. a domestic kitchen baking cakes), please contact an Environmental Health Officer to discuss. Each case will be individually assessed.

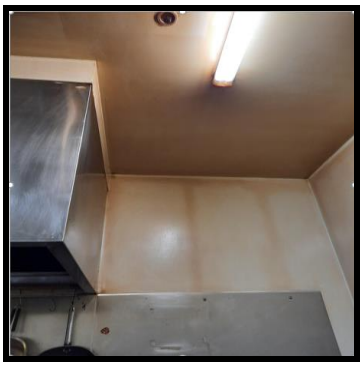
Cleaning and Maintenance

All mechanical ventilation exhaust systems require routine cleaning to ensure they remain effective at removing steam, grease and vapours and that they meet the requirements under the *Food Act 2006*. Additionally, it is also important to maintain these systems from a fire safety perspective and to ensure your insurance policy is not voided.

The frequency of cleaning will depend upon the individual ventilation unit, types of foods cooked, and the frequency and duration of use of the equipment.

Generally, the following cleaning schedule can be used as a guide on minimum frequency for cleaning. Please note that whilst some of the above can be cleaned by employees working at the premises (e.g. gutters and filters), some items will require cleaning by specialist service providers (e.g. internal ductwork).

Item	**Frequency**
Gutters	Daily
Filters	Weekly - Fortnightly
Internal and external surfaces of the canopy hood	Fortnightly
The flu and/or internal ductwork of the system	6 - 12 monthly



Further reading

Food Standards Code (www.foodstandards.gov.au/code)

Food Act 2006 (www.legislation.qld.gov.au)

AS4674 – Fit-out guide for a food premises (www.saiglobal.com)

AS 1668.1 and AS 1668.2 - Mechanical Ventilation (www.saiglobal.com)