Understanding Kitchen Ventilation

In the kitchen, a ventilation system removes heat and grease coming from cooking equipment, steam from ware washing and boiling and dangerous carbon monoxide fumes produced from the combustion of gas cooking equipment. Front of house, a ventilation system removes smoke, keeps the restaurant or bar at a pleasant temperature and reduces humidity. Externally, it can remove cooking smells, which are being discharged into the atmosphere to the annoyance of other businesses or houses in the vicinity.

A kitchen ventilation system, incorporating extract and supply air is not an optional extra any more, but a legal requirement. Legislation regarding health and safety in the workplace insist on kitchens being well-ventilated and comfortable to work in. This is not met by just opening a window or door, which in itself would give access to airborne pollution. Tobacco smoke in public areas is a huge issue both for customers and staff. Any cooking smells being discharged into the outside is not just a nuisance to neighbours, but also a reason to be refused planning permission for any kitchen redevelopment or the subject of an enforcement notice for an existing kitchen.

It is now a requirement to comply with BS-6173 to have the gas supply interlocked with both the extract and supply air systems. This automatically switches off the gas supply should the extraction system stop working for any reason and a fire occur in the extraction canopy.

There are two main types of kitchen ventilation, canopy or ventilated ceiling. Canopies are the most popular in commercial kitchens. Both systems involved a system of filters and fans, exhausting the heat, dangerous gases and humidity and trapping particles of food and fat debris while at the same time introducing cleaned and cooler air into the kitchen.

The system to fit depends on the nature of the kitchen operation, the available space and nature of the cooking. One of the variable features of a kitchen ventilation system is the type of filtering system used to remove food debris, notably grease. Grease is not just an unwanted smell; it is also a high fire risk within the extraction systems. There are six types of grease filter available.

Mesh filters – These are layers of metal mesh onto which the grease particles are deposited as they are drawn through the system. They require regular washing, are not efficient at removing high levels of grease and in a high-fat kitchen can pose a fire risk in the extraction system. These types of filters should only be used where there will be little or no grease held in suspension within the exhaust gases, therefore, these filters should not be installed above deep fat fryers, chargrills, griddles, salamander grills or bratt

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pans to be used for shallow frying. Cleaning of these filters is done by soaking them in very hot water with a de-greasing detergent, although this will eventually destroy the internal mesh and require the filter to be replaced.

Baffle filters – More efficient than mesh filters, as they work by making the air change direction and velocity, which separates the grease from the air stream with the deposited grease running off into grease collection troughs. These types of filters are suitable for general cooking with moderate grease load applications. These filters should only be manufactured from stainless steel. Cleaning procedure is very simple as they can be simply washed in a commercial dish washing machine.

Cartridge filters – These types of filters should not be confused with disposable filters, as disposable filters should never be used in commercial kitchen extract systems. Cartridge filters are stainless steel filters, which are more efficient than baffle filters as they are intended for moderate to heavy grease load applications. These types of filters will be cleaned, like the baffle filters, by running through a commercial dishwashing machine.

Water wash – A more advanced cartridge system where the filters are subject to an automatic internal washing cycle to clean them, usually at the end of the working day. They need a hot water supply and are among the more expensive systems, but are very good at extracting grease.

Continuous water mist - Regarded as one of the most effective of grease extraction systems, but requires plumbing and is expensive. There is a continuous mist of cold water sprayed into the extraction system that emulsifies the fats and causes it to drop into a collection trough.

Ultra Violet UV-C - The latest technology for the efficient elimination of grease from within kitchen ventilation systems is the combination of Cartridge filters and Ultra Violet UV-C light. This will give grease and odour removal efficiencies in excess of 98%.

Fire risk

The large amount of grease drawn into a kitchen ventilation system creates a fire risk. One of the most common causes of commercial kitchen fires is through sudden combustion of grease-laden air in the extraction system. It can happen very quickly with no obvious cause to the kitchen staff. Where more than moderate grease extraction is happening, a fire suppression system needs to be built into the ventilation system.

Most fire suppression systems use either wet or dry chemicals that are activated automatically in the event of a fire, which originates in any one item of cooking equipment. In the event of a fire in the ventilation system, there should be a trigger mechanism that shuts off gas and electricity supplies to prevent making the fire worse. The Association of British Insurers has produced a Fire Risk Assessment document for kitchen ventilation systems.

Cleaning

Cleaning of extraction systems is essential on both hygiene and fire safety grounds. If there is a high level of frying within the kitchen the essential cleaning may be as frequent as weekly. The kitchen designer or installer will advise on the frequency of cleaning. Failure to follow laid-down ventilation system cleaning routines could render insurance invalid in the event of a kitchen fire.

How to find out more about ventilation and air conditioning equipment

Talk to the experts

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