

# Fires in Commercial Kitchens

Cooking fires remain in the top of all accidental fire causes in the UK. Latest figures indicate that cooking appliances were the source of ignition in 48% of accidental dwelling fires in 2018. However, whilst the number of fires in commercial kitchens is much lower, the potential for much more serious damage is huge.

The main differences between domestic and commercial kitchens are the greater numbers of meals being prepared and therefore the greater capacities of fryers, ovens, hotplates etc. For the same reasons, kitchen equipment will be used to a much greater extent, with restaurant kitchens typically open ten hours per day and some hotel kitchens opening very early for breakfast and closing late after dinner. It is also not uncommon to see fast food establishments cooking 24 hours per day, seven days a week.

The capacity of contemporary commercial kitchens brings its own problems. In addition to serving staff, busy kitchens can employ numerous cooks and chefs and those engaged in preparation and cleaning. This is despite advances in modern technology actually reducing numbers in commercial kitchens.



Busy commercial kitchen

## Human Element

A busy hotel or restaurant kitchen will be divided off into various 'stations' for frying, sautéing, grilling and creating specialist dishes such as pizzas. Multiple members of staff move around a bustling working space complete with hot ovens, lit cooking rings and grills, some cooking and some carrying large plates and bowls of food.



Frying fire

Human error is a common cause of commercial kitchen fires: picture a carelessly placed tea towel near a cooking ring, or a frying pan full of oil left unattended. IFIC Forensics attended one restaurant kitchen fire in recent months where evidence pointed to a chef's gas blow lamp being inadvertently left on top of a switched-on hot plate!

Suitable induction training is essential for all kitchen staff and should be refreshed regularly. Staff should be aware of good housekeeping measures, the risks posed by heat in the kitchen, how to use fire blankets, extinguishers and gas and electric isolation valves. Staff should know what emergency procedures are in place, when to remain or leave their station and how to summon emergency assistance in the event of a fire. Working areas should be kept tidy and rubbish and bins cleared regularly to minimise available combustible material.

## Frying Equipment

Kitchens will invariably use both shallow and immersive frying equipment, containing varying quantities of hot and combustible cooking oils and fats. Whether a small frying pan, or a large chip range, these are a frequent cause of fire, either through being left unsupervised, or in the case of deep fryers, through malfunction of temperature control equipment.

This equipment is usually fitted with two thermostat devices. A 'working temperature' thermostat to allow the operating temperature to be set (around 190 °C) and an 'overheat limit'

thermostat usually providing a maximum permitted temperature of around 230°C. These fryers require regular cleaning, inspection and maintenance to minimise deposits of spilled grease and to ensure that safety devices are working correctly.

Because of the risks involved, it is recommended that in addition to portable fire extinguishers, fixed fire suppression systems are fitted above fryers and grills, which should also protect overhead canopies and ducting. Oil & fats burn at relatively high temperature and hence once they catch fire, extinguishing them manually is very difficult.

These systems usually consist of a wet agent tank enclosed in a cylinder mounting box, temperature sensors, heat sensing cable, control panel, nozzles and piping. They can be activated through automatic detection or manually, causing the wet agent to be discharged, extinguishing the fire. Such systems may also be capable of switching off gas and electric supplies on activation to better control the fire.

### Fume Extraction Systems

One common feature of many commercial kitchen fires is the involvement of fume extraction equipment. Mechanical extract ventilation should be provided for all cooking equipment producing heat, fumes and products of combustion. These systems use overhead filter and canopy arrangements with ducting systems that will discharge fumes to the open air for staff comfort, health & safety purposes. Typically, cooking fumes will have suspended within them, vaporised oil and grease particles, which will when cooled, condense and deposit within extraction ducting and on walls at the point of exhaust if not properly designed.

The presence of deposits of combustible grease within ducting systems present a significant risk of spreading any fire originating within or even below the extraction system, throughout the building. It has been estimated that 70% of serious commercial kitchen fires involve the extraction system.

The correct design and installation of these systems is critical in ensuring that fumes are efficiently filtered and removed. The ducting should be provided with access points throughout its length to ensure that inspection can be carried out and cleaning can be properly and effectively undertaken. Regular and effective cleaning of these systems is vital to avoid fires.

Specialist contractors have developed many techniques using cameras, physical removal and chemical treatments to remove grease deposits. There is also measuring equipment available that can accurately read the thickness of before and after grease deposits.



Extraction canopy with fire suppressions system nozzles

Most insurance policies that refer to commercial kitchens have conditions which relate to the degree and frequency of extract cleaning. These conditions/warranties and cleaning records are crucial in determining compliance, particularly during post fire investigations.

Most policy conditions derive from industry guidance, exemplified by “TR19 Guide to Good Practice: Internal Cleanliness of Ventilation Systems” published by the Building and Engineering Services Association. TR19 gives guidance on extraction system cleaning intervals which vary dependant on levels of use (Heavy, Moderate, Light). It details inspection mechanisms as well as the cleaning processes to be used. It is now a requirement that the specifications detailed in TR19 are used by any contractor working in the industry.

### Conclusions

Fires in commercial kitchens are far from rare. As a place of work, they are covered by The Regulatory Reform (Fire Safety) Order 2005 and as such require the responsible person to ensure that a thorough fire risk assessment is carried out, all fire risks considered and addressed and perhaps most importantly, some fire safety training is provided for all staff working in the risk area.

It is recognised that this is not easy, particularly with the frequent use of agency staff, but those working in these potentially high risk areas should know about the importance of good housekeeping, the risks posed by open flames and hot surfaces, what they can do to reduce the risk of fire and critically, what to do should the worst happen.