

## Kitchen Fires

### Understanding the Risk

Cooking facilities are present in a vast range of commercial premises including hotels, schools, restaurants, fast food outlets and public houses plus less obvious examples such as work canteens in factories or offices. Fires starting in kitchens still feature prominently in UK loss statistics. Causes of fires are varied and include electrical faults in fixed wiring or the numerous appliances that can be present plus the cooking process itself, especially with the presence of hot cooking oils in deep fat fryers.

The resultant loss of a facility and disruption to the business can have a severe and immediate impact especially where cooking is the core activity. Where cooking is an ancillary activity in a 'host' occupancy, a fire starting here can spread to more important areas of a premises and cause widespread damage.

The risk where cooking is undertaken needs to be understood, managed and controlled in order to reduce the likelihood of a fire starting in the first place or mitigating the extent of damage should the worst happen.

In order to do this, it is necessary to firstly consider the inherent risks associated with cooking facilities before deciding on an effective programme of risk control measures.

One of the biggest hazards in a kitchen is the use of cooking oils which are typically used at temperatures of around 200°C. If the temperature the oil is heated to is too high, either by operator error or failure of the thermostats, then self-ignition can result in a fierce fire which unless controlled can spread easily to surroundings and into hard to reach hidden areas such as extract plenums and ducts. The safety margin between cooking and self ignition temperatures reduces as the oil is used due to oxidation processes and contamination so regular replacement with fresh oil is important.

During the cooking process, grease laden fumes are produced which will deposit on surfaces especially in extract hoods, plenums and ducts. If these grease deposits are left to accumulate over time and are ignited, the fire will be difficult to extinguish manually especially if it spreads to hidden or inaccessible areas. Fire spread



through greasy ducting can be rapid and will jeopardise other portions of the building which can potentially result in significant direct damage and consequent interruption to the business.

### Related Loss Statistics

Typically, fires resulting from cooking facilities fall in the top 6 causes in the UK. According to statistics collated by the Fire Protection Association (FPA), the main specific causes for kitchen fires over a 10-year period are shown in the graph (below). These figures only relate to fires reported to the FPA and are not therefore complete but during this period, there were a total of 45 serious fires resulting in damage in excess of £50m with an average loss per incident over £580,000.

Whilst these figures are incomplete, the losses are significant and clearly demonstrate a need to seriously review measures to prevent or mitigate this risk.

The impact of a serious fire goes beyond the direct physical damage and financial considerations. The full impact of a serious fire can have long lasting affects with possible long term loss of turnover as customers may seek products and services from competitors. The threat to life should also not be overlooked and this includes staff as well as your customers.

### Controlling the hazard

It will be evident that the hazards involved with cooking facilities need to be adequately risk assessed and controlled to eliminate, reduce or control them to create a safe working environment. This is important not only to protect the financial status of your business but also to fulfill your legislative obligations under the Regulatory Reform (Fire Safety) Order 2005 or Fire Safety (Scotland) Regulations 2006.

Controls that can be in place generally fall into 2 categories which are:

- Human element - relating to the management procedures primarily aimed at reducing the likelihood of an event occurring or how to react to an emergency event.
- Physical element - relating to protection or design principles aimed at reducing or mitigating the effect should an incident occur.

The following issues under these 2 headings should be considered fully to create an integrated risk control programme:

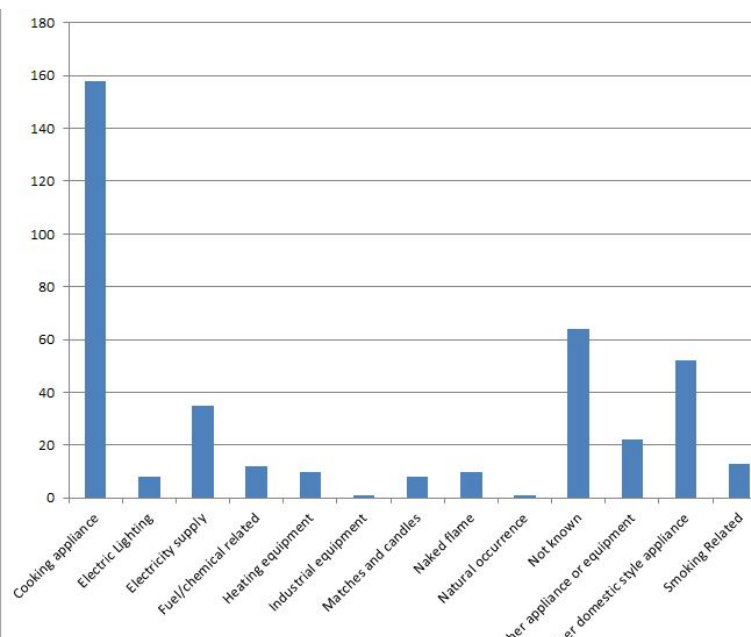
### Human Element

- Undertake fire risk assessments to identify hazards and develop self-inspection checklists
- Maintain good housekeeping regimes to eliminate unnecessary combustibles
- Provide and maintain up to date record of induction and refresher training to employees in the correct use of protection equipment and emergency fuel isolation switches or valves
- Develop written emergency plans and have regular fire drills
- Clean extract filters, grease traps and canopies at frequency determined by risk assessment (normally weekly) and keep record
- Regularly replace the cooking oil based on risk assessment – replacement or replenishment should not be undertaken when the oil is hot
- Arrangements should be in place for full length deep clean of extract ductwork by specialist contractor at a frequency determined by risk assessment (at least annually for light use). This is to remove greasy fat deposits within the ductwork which if left unchecked would assist fire spread.
- Arrange for cooking equipment & electrical installations to be inspected and maintained by competent company
- Ensure deep fat fryers are not left unattended when in use and the fuel supplies to all cooking equipment is switched off at the end of the working day

### Physical Element

- Eliminate the use of combustible materials in the construction of kitchens
- Locate kitchens in a separate fire compartment providing at least 1-hour fire separation
- Arrange the layout of the kitchen to ensure appliances and equipment are readily accessible to facilitate regular maintenance
  - Ensure deep fat fryers are provided with a separate non-self-resetting high temperature limit control thermostats in addition to the normal operator thermostat
  - Deep fat fryers should be provided with metal lids
  - Interlocks should be provided to ensure the cooking ranges cannot be operated without the extract systems in operation
  - Provide easily accessible and identifiable manual emergency shut off switches and valves preferably on exit routes

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- As a minimum provide a suitable 'F' rated portable fire extinguisher designed specifically to fight fires involving fat. This is in addition to fire blankets which are required by legislation.
- Extract ducting should be provided with runs kept as short as possible avoiding horizontal runs. Material should be stainless steel or galvanised metal, have liquid tight seams and have adequate inspection openings to facilitate a full length deep clean
- In view of the speed and severity of deep fat fryers, a suitable fixed automatic wet chemical fire suppression system should be considered to provide full protection to the cooker ranges and inaccessible areas such as filters, plenum and extract duct entrance. Such a system should be provided with manual override facilities in addition to the automatic actuation device and should be interlocked with the fuel supplies to shut these down on operation. The system should be designed and installed in accordance with recognised standards such as NFPA 17A, UL-300 or in UK, LPS-1223 issued by the Loss Prevention Certification Board (LPCB).

### Fire Suppression Systems

Other than the regular cleaning of extract filters, canopies and the entire extract ducting based on usage and risk assessment, the provision of a suitably designed and installed automatic wet chemical kitchen fire suppression system is one of the most effective solutions to fight deep fat fryer fires. These systems will provide a safe and effective means of controlling kitchen fires that if uncontrolled, can result in significant damage and consequent interruption to operations.

Kitchen suppression systems should be designed, installed and maintained by competent companies in accordance with a recognised standard as detailed above. For the UK the relevant standard is *LPS-1223: Requirements and Testing Procedures for Approval of Fixed Fire Extinguishing Systems for Catering Equipment*.

### Solution Supplier

Tyco Building Service Products UK Ltd supply Ansul R-102 wet chemical fire suppression systems to LPS-1223 issue 2.3 standard through a network of trained and authorised agents.

For more information, ask your AIG risk engineer.

Note that it is not a requirement that you use this particular supplier. Any company presenting a certificate to LPS 1223 is acceptable.



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