

# FIRE SAFETY GUIDE TO COMMERCIAL KITCHENS



This document is designed to assist NFU Mutual customers in managing fire risks associated with commercial kitchens



**NFU Mutual**  
RISK MANAGEMENT SERVICES

## INTRODUCTION

Commercial kitchens are an integral part of many businesses, ranging from restaurants, hotels and cafes to public houses, garden centres, event venues and workplace canteens. Even a limited kitchen shut-down can have a significant impact on the ability of a business to continue trading, with resultant loss of trade and associated income, as well as posing the potential to cause catastrophic damage to the building and longer-term closures.

The potential for significant loss can be reduced by implementing a Risk Management Programme to minimize the potential hazards. A designated person or team should oversee the programme to ensure all aspects are properly managed, and any required corrective action is implemented without delay.

## MAIN CAUSES OF COMMERCIAL KITCHEN FIRES

1. The main fire hazard in any commercial kitchen is the use of heated oils/fats and the risk of overheating, either due to operator error or a fault with cooking equipment, such as faulty thermostatic controls. The relatively narrow margin between the safe cooking temperature for oils/fats (around 205 °c) and the temperature at which flammable vapors are given off (around 230 °c) requires constant supervision, whilst if further heating is allowed there is a very significant risk of spontaneous ignition (between 310 °c and 360 °c). Different types of cooking oils will each have their own safe cooking temperature and reference should be made to the individual manufacturer's instructions, however repeated use of the oil/fat will alter its fire related properties and it is important to follow manufacturer's instructions concerning the frequency and safe practice of changing old for new product.
2. Flames, sparks or hot gases can ignite combustible deposits inside extract ducts, therefore good housekeeping controls must be implemented to ensure the risk is minimized - see Extraction Units and Ducting below.
3. Fault or failure of cooking equipment, including fan motors within extraction systems, leading to fires or sparks being generated, often in proximity to hot oils/fats. Regular servicing and maintenance of the cooking equipment, as per the manufacturer's instructions, will minimize the risk of such incidents and should form part of your preventative maintenance schedule.
4. Unattended cooking activities and equipment not being switched off at the end of the working day. Cooking activities should always be supervised by a trained operator who is familiar with the fire safety procedures and fire-fighting equipment provided in the kitchen. Use of stockpots, and similar overnight cooking methods, should not be permitted.

## TRAINING

Employees using catering equipment to be fully trained in the equipment's safe use and made aware of all safety features including isolation points for gas and electric heating

sources. Employees to also be instructed in the hazards associated with cooking oil/fat fires and the safe use of fire-fighting equipment.

## EXTRACTION DUCTING AND FILTERS

The main fire risk in extraction ventilation and ducting is caused by flames, sparks or hot gasses from cooking activities igniting an excessive build-up of cooking oil/fat deposits, with some mixtures such as animal fats and vegetable oil being more readily ignitable.

Mechanical extract ventilation to be provided for all cooking equipment producing heat, fumes and products of combustion. Extraction to be via an overhead canopy and ducting system that discharges to the atmosphere so that grease will not be deposited on the building or adjoining properties. The system to be constructed of galvanised or stainless steel, with all seams and joints liquid tight, and have smooth surfaces to enable cleaning and suitable lighting arrangements.

Any ducting which passes through fire compartment walls to be fitted with automatic fire dampers which are subject to on-going maintenance and protected

to the same fire resistance as the walls themselves. Any combustible material in proximity to ducting to be cut away for a distance of at least 150mm and backfilled with a non-combustible material, where achievable,

Ducts to not pass through or be contained within combustible floor or ceiling voids. Bends which might collect residues to be engineered out of the design or, at each change in direction of the duct, an opening with a grease tight cover provided for cleaning purposes.

Filters or grease removal devices to be provided, these conforming to **LPS 1263 Requirements for the LPCB approval and listing of the fire performance of grease filters used in commercial kitchen extract systems** (<https://www.redbooklive.com/download/pdf/LPS1263.pdf>).

Mesh-type filters offer no flame protection and are not to be used.

## OPENINGS

All doors and hatches to be fitted with automatic fire shutters to the same fire rating as kitchen compartment walls, or to provide at least 90 minutes fire resistance. Fire shuttering to be linked via relay switch to fire

alarm to ensure operation upon fire alarm activation. All openings to be maintained clear of obstructions that might impede shutter closure e.g. trolleys, cutlery trays, confectionary displays etc.

## CLEANING

Recognised cleaning industry standards, such as **Building and Engineering Services Association Guide TR/19 Internal Cleanliness of Ventilation Systems**, to be adopted. Cleaning intervals depend on the type of equipment and extent of its use, but it is recommended removable grease filters are cleaned at least weekly and ductwork

to the extraction system is subject to a maintenance contract that includes a deep clean a minimum of at least once every 12 months but dependent on the extent of use, the risk assessment and terms of any insurance warranty. More frequent cleaning may be identified by the Contractor following an inspection of the duct system.

KITCHEN EXTRACT SYSTEMS TR19 – FREQUENCY OF CLEANING				
Grease Production	Cleaning Intervals (months) – Daily Usage			
	Up to 6 hours	6 – 12 hours	12 – 16 hours	16+ hours
<b>Low</b> No significant production during normal cooking operations	12	12	6	6
<b>Medium</b> Moderate production during normal cooking operations	12	6	4	3
<b>High</b> Significant production during normal cooking operations	6	3	3	2

Cleaning to be undertaken by a competent contractor who is audited against a recognised scheme, such as:

- **‘Ventilation Hygiene Elite’** (VHE) from BESCA, the UKAS accredited certification body of the Building Engineering Services Association (BESA) [www.besca.org.uk/find-a-besca-member](http://www.besca.org.uk/find-a-besca-member)
- **LPS 2084 ‘Requirements for the LPCB approval and listing of companies carrying out inspection, cleaning and maintenance of ductwork systems’** [www.redbooklive.com](http://www.redbooklive.com)

Both of the above schemes require that a record be made of measurements of the pre-

clean and post-clean contamination of the ductwork system including film thickness measurements as well as location of access panels, dampers and existing fire protection measures. Any remedial items identified in a post-clean report to be implemented at the earliest opportunity. Photographic records to be made where appropriate to evidence effectiveness of the cleaning process and recommendation made for any access improvements to better facilitate the ongoing cleaning and maintenance of the ductwork system.

## SAFETY INTERLOCKS

Gas-fired catering ranges with mechanical extraction systems to include gas interlock systems as required by **BS6173 - Specification for installation and maintenance of gas-fired catering appliances for use in all types of catering establishments (2nd and 3rd family gases)**.

Appropriate interlocking system between any mechanical ventilation system and the operation of gas appliances to be fitted so that failure of the system causes the gas supply

to be automatically shut off. Installation of manual bypasses to such interlock systems is not permitted. Effective preventative maintenance and cleaning will help to prevent appliances from regularly shutting down due to the ventilation system failing.

Manual emergency shut-off switches and valves to be provided on exit routes and made easily accessible and identifiable to all kitchen and management staff.

## DEEP FAT FRYING

Deep fat frying to only be undertaken in purpose designed equipment and not in open pans on the hob. Given the increased risk of fire originating from fat frying, installation of a fire suppression system to be strongly considered (see Catering Fire Suppression Systems).

Deep fat fryers to be fitted with thermal cut out devices which automatically shut off the heat source should the temperature of the oil/fat exceed 230°C. Self-resetting thermal devices are not to be used.

Caution to be exercised when changing or replenishing oil/fat to avoid spillage or overfilling. The cooking oil/fat level in the pan must be maintained within the stipulated levels for safe operation so the sensing device or the electrical heating element is not exposed during operation. Oil/fat must be changed in accordance with supplier’s recommended intervals and should only be undertaken when the appliance is switched off and allowed to cool.

## CATERING FIRE SUPPRESSION SYSTEMS

A catering fire suppression system to be installed to all commercial cooking ranges. Such suppression systems to be designed and installed by an insurer-approved company to a recognized industry standard, such as **LPS 1223 Requirements and testing procedures for the LPCB certification and listing of fixed fire extinguishing systems for catering equipment**.

The basic concept of a fire suppression system is to deliver localised suppressant,

predominantly a water/chemical-based agent, to the fire preventing oxygen from contributing to the fire. The suppressant is non-toxic and non-corrosive meaning that it will not cause damage to the cooking appliances or the surrounding environment. Such systems can be retrospectively installed to a cooking range with minimal disruption and cost to the business varying on the size of the range and scope of protection required.

Fire suppression systems to protect the extract system and all cooking appliances served by it, and also be capable of detecting fires initiated in any of the cooking appliances and extract hood. The length of ducting to be protected to be determined by an assessment of the likelihood of fire breaching other areas and to account for building construction,

fire compartmentation and position of the discharge duct etc.

Automatic and manually actuated safety interlocks to be incorporated to shut-down the extract fan and the heat source of the catering equipment, and connection to the automatic fire detection system arranged where present.

## PORTABLE FIRE EXTINGUISHERS/FIRE BLANKETS

Suitable portable fire extinguishing appliances, including Class F appliances, to be located throughout the premises. Regular inspection and maintenance to be undertaken, and recorded, by an approved supplier. Staff to be provided with instruction and

training in the correct use of extinguishers.

Fire blankets to also be considered as a suitable supplementary means of fire-fighting subject to appropriate training.

## COOKING OIL STORAGE

Cooking oil, both used and new, to be stored on banded pallets in a secured store, or yard and preferably remote

from the main buildings and other combustible goods such as waste receptacles, pallets, gas cylinders etc.

## FIRE RISK ASSESSMENT

A fire risk assessment to be undertaken to identify and evaluate the potential for a serious fire at your premises. Responsibility for the fire risk assessment rests with occupiers and owners of business premises and should include the construction of the premises, working practices within, fire inception hazards, likely fire spread potential and the suitability and standard of fire protections including your fire alarm, fire doors, emergency lighting, escape signage

and fire extinguishing appliances. The risk assessment to be carried out by a suitably competent person and any necessary control measures carried out to reduce the risk and effects of fire.

We recommend the local Fire & Rescue Service are invited to visit the location to assess water sources and familiarise themselves with the layout and the location of the premises.

## CHECKLIST

A checklist is provided below to assist the review of safety within a commercial kitchen, which can be tailored to meet your own requirement. Further assistance can be provided by your contacting your local NFU Mutual Agent or Risk Management Consultant.

### Please Note

The checklist provides general information only and may not cover all of the hazards present in your kitchen.

### Checklist – Fire Safety in Commercial Kitchens

Fire safety management	Yes	No	N/A	Action required	Due date	Sign on completion
Are cooking appliances installed, operated, serviced and maintained in accordance with the manufacturer's instructions?						
Are the installation, servicing and user's instructions filed safely for future reference, together with service records?						
Is a metal container with a metal lid provided for storing wipes that have been used to mop up spillages of cooking oil and is it located externally at least 10m from the building (or as far as reasonably practicable)?						
Where possible, are drums and large containers of cooking oil kept in banded stores or stored on pallets that incorporate sumps to retain any leakage with the sumps being inspected periodically and emptied and cleaned following any leak?						
Is care taken during cleaning and maintenance operations that any wheeled equipment that is moved is returned to its correct position beneath the outlets of fixed fire suppression systems?						

Compartmentation	Yes	No	N/A	Action required	Due date	Sign on completion
Are any gaps around services entering or leaving the kitchen filled with proprietary penetration sealing material or service opening passive fire protection systems so as to provide at least the same level of fire resistance as the element of construction in which it is located?						
Is any opening between a kitchen and dining area forming a servery protected by a shutter with a fire resistance of the same standard as that of the kitchen enclosure?						
Are staff made aware that care must be taken not to position trays of cutlery or other items beneath the shutter and thus compromise its effectiveness in the event of a fire?						
<b>Installation and use of cooking equipment</b>						
Are emergency manual controls for fire suppression systems and Isolators for gas and electrical supplies located on escape routes from the kitchen so that they are safely and easily accessible?						
Is care taken during refurbishment to ensure that a deep fat fryer is not sited immediately beneath water pipes because of the danger from leaking water?						
Are Portable and fixed electrical appliances selected based on their being suitable for use or installation in a commercial, rather than a domestic kitchen?						
Is the installation of cooking equipment fully in accordance with the manufacturer's instructions, especially where innovative professional cooking equipment such as salamander grills, jospier grills and pizza ovens are installed?						
Is the installation of electrical wiring in the premises fully in accordance with the requirements of the current edition of BS 7671: Requirements for electrical installations IET Wiring Regulations?						

Installation and use of cooking equipment	Yes	No	N/A	Action required	Due date	Sign on completion
Are gas pipes and electrical equipment sited so that they are not susceptible to the effects of heat, water vapour, grease or mechanical damage?						
Are deep fat fryers fitted with high temperature safety thermostats set to prevent the temperature of the fat rising above 205°C (or the manufacturer's maximum recommended temperature if this is less than 205°C)?						
Are fryers additionally equipped with a separate high temperature limit control, of a non-self-resetting type?						
Are gas appliances equipped with flame failure devices to cut off the fuel supply in the event of flame failure and are they in good working order?						
Are devices fitted that prevent gas being supplied to burners when the extract system is not in operation?						
Are the controls of electrically heated ranges interlocked so that it is only possible to switch the heating elements on when the extraction system is operating to remove flammable vapours?						
Before use, is a check made to ensure that the surface of the cooking oil in the pans to be used is between the minimum and maximum levels marked for safe operation?						
In the case of gas-heated ranges is the extractor fan switched on and allowed to run at least two minutes before lighting up?						
Are extractor fans run at all times during frying and for 20 minutes after frying is finished, to cool down the range?						
In addition to turning the burner or heater controls off, is the main gas cock or electricity supply isolated at the mains after each deep fat frying session?						

Extraction systems	Yes	No	N/A	Action required	Due date	Sign on completion
Is mechanical extract ventilation provided for all cooking equipment producing heat, fumes and products of combustion?						
Where heating is by gas, is the heat and fume extraction ducting separate from the ducting used to extract combustion products from the burners?						
Is extraction via an overhead filter and canopy arrangement with a ducting system that discharges to the open in such a manner that grease will not be deposited on the building or adjoining properties?						
Is extract ducting as short as practicable with the duct passing directly to the open and not passing through, or be contained within, floor or ceiling voids or roof spaces where exposed combustible materials are present?						
Is the whole of the ducting accessible for cleaning?						
At each change in direction of the duct is an opening with a grease-tight cover provided for inspection and cleaning?						
Where ducts pass through any combustible material, is it cut away for a distance of at least 150mm from the duct and the space filled with non-combustible insulation?						
Is the use of brick chimneys or flues to conduct grease fumes away from cooking equipment avoided unless they are lined with an impervious, non-combustible material?						
Are filters, traps or other forms of grease removal devices provided as close to the deep fat frying range or fryer as possible?						

Maintenance	Yes	No	N/A	Action required	Due date	Sign on completion
Is discoloration of the oil monitored using proprietary charts, available from the manufacturers or suppliers of the product?						
Where large volumes of deep fat frying are undertaken, such as in fish and chip shops, is the cooking oil filtered daily?						
Is cleaning of the surfaces of all cooking equipment hoods and canopies, ductwork, fans, burners and fixed fire extinguishing equipment carried out at frequent intervals?						
Are daily checks made to ensure that the nozzle caps on the spray heads of the fixed fire suppression system are in place to prevent oil and fat from building up and compromising the effective action of the installation?						
Is special attention given to the selection of filters to be installed, especially those immediately above griddles, bratt pans, deep fat fryers or other equipment that can produce large amounts of grease or fat in the exhaust gases?						
Are staff aware that the cleaning of filters does not remove the need for periodic inspection and removal of grease deposits from the inside of ductwork and the extraction motor?						
Is confirmation by certification sought that the kitchen extract ductwork has been cleaned by a competent specialist contractor?						
Is the use of flammable solvents or other combustible based cleaning aids prohibited in the cleaning of filters or ductwork?						
Is electric power to the range isolated before commencing cleaning or maintenance operations?						
Are appliances serviced at least annually by suitably qualified personnel in accordance with the manufacturer's instructions?						
Are flues and grease traps always cleaned following servicing or cleaning of the burners?						

Fire protection	Yes	No	N/A	Action required	Due date	Sign on completion
Is the kitchen protected by an automatic fire detection and alarm installation complying with <b>BS 5839-1 Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises</b> , with suitable heat detectors being provided in the cooking areas?						
Where a deep fat fryer has a surface area greater than 0.4m <sup>2</sup> is it protected by an automatic fire suppression system?						
As well as providing an automatic fire suppression system to protect deep fat fryers, is a suitable installation provided, with both manual and automatic operation, to protect grilles, hobs, bratt pans, the overhead canopy and ducting system?						
Where a fixed fire suppression system is installed has it been tested and approved to an appropriate standard and been installed by an engineer with appropriate third-party certification?						
Are a suitable number of appropriate portable fire extinguishers available, suitably located and immediately accessible in case of a fire?						
Have operators been made familiar with the location of the main isolator or shut off valves and the operation and correct method of use of portable fire extinguishing appliances and any fixed fire extinguishing system?						
Are staff aware that an outbreak of fire involving burning gas should not be extinguished until such time as the gas supply has been shut off?						

## IMPORTANT NOTE:

The information contained herein is designed for guidance only and NFU Mutual cannot accept responsibility for any errors or omissions arising from its use. Should further guidance be required please contact our local NFU Mutual Regional or Branch office, or telephone Risk Management Services on 01789 202425.



**NFU Mutual**

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