Recommendations

RC16b

for cooking equipment (other than fish and chip frying ranges)

FPA
Fire Protection Association

Association of British Insurers

LOSS PREVENTION RECOMMENDATIONS

These Recommendations are part of a series of insurer documents developed under the Insurers' Fire Research Strategy Funding Scheme (InFiReS) and published by the FPA. InFiReS membership comprises a group of UK insurers that actively support a number of expert working groups developing and promulgating best practice for the protection of property and business from loss due to fire and other risks. The technical expertise for the Recommendations is provided by the Technical Directorate of the FPA and experts from the Insurance Industry who together forms the InFiReS Process Steering Group.

The aim of the FPA Series of Recommendations is to provide loss prevention guidance for industrial and commercial processes and systems. The series continues a long tradition of providing authoritative guidance on loss prevention issues started by the Fire Offices' Committee (FOC) of the British Insurance Industry over a hundred years ago and builds upon earlier publications from the LPC and the ABI.

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Scope

These Recommendations apply to the installation, operation and maintenance of cooking appliances generally but with an emphasis on the hazards of the use of fats and cooking oils. Frying ranges encountered in fish and chip shops are peculiar to those establishments and so they are not covered here but are the subject of a separate document (RC16A) in this series of Recommendations.

Hazards from cooking processes arise in a wide variety of occupancies, including hotels, restaurants, canteens, fast food retail premises and residential homes. The recommendations set out in this document are not intended to apply to cooking equipment in food processing factories, to solid fuel or oil-fired appliances, or to premises where cooking only involves the preparation of light snacks and beverages.

Cooking equipment installed or used in vehicles or in the open is also outside the scope of this guidance.

Throughout this guidance the use of the word 'fat' may freely be interchanged with 'cooking oil'.

Introduction

Catering establishments use increasingly complex equipment to produce food from different cultures for a population with a large amount of leisure time to spend enjoying food that may range from haut cuisine to a meal from a fast food restaurant.

Despite the variety of cooking processes involved, the main fire hazard encountered in food preparation remains the use of heated fats and the risk of over-heating the fat due to operator error or failure of a thermostat in equipment. This can be a particular problem if the cooking is left unattended in the kitchen.

There are only small differences between the safe cooking temperatures of oils and fats (about 205˚C), the temperature at which flammable vapours are given off (about 230˚C) and that at which spontaneous ignition occurs (between 310˚C and 360˚C). The fire related properties of fats change during use; one indication of this is the darkening of the colour resulting from oxidation. Monitoring the discoloration can be carried out using proprietary charts, available from the manufacturers or suppliers of the product.

Other causes of fire include the spillage or over-filling of fats when changing or replenishing supplies whilst the appliance is hot; the proximity to deep-fat fryers or other cooking equipment which might be a source of ignition; and the direct exposure of grease-removal devices in the fume-extraction systems to flame impingement or hot flue gases from the heat sources of the equipment.

If deposits of grease are allowed to build up in fume extract ducting, the introduction of an ignition source may lead to these becoming ignited and spreading fire rapidly throughout the complete ducting system. The fire could spread to other parts of the building and the resulting damage to the ductwork and elsewhere could be serious enough to necessitate lengthy and costly remedial work resulting in considerable interruption to the business operations.

Gas escaping from LPG cartridges and the careless operation of LPG flambé lamps or chefs' blowlamps can also result in fires and serious injury.

Cooking oil and fat fires can generate considerable quantities of heat and smoke which, in the event of fire in confined cooking areas, make extinguishment by hand appliances difficult even if operators have suitable types of extinguishers and have received appropriate training and instruction in their use.

Recommendations

These recommendations apply to all equipment.

1 Siting and location

1.1 All items of cooking equipment should be located in a designated area.

1.2 Cooking appliances should be located in building compartments having a fire resistance of at least 30 minutes; the rooms should have non-combustible walls, floors and ceilings. Any combustible surfaces should be overlaid or lined with non-combustible material.

1.3 Any gaps around services entering or leaving the cooking area should be filled with suitable material so as to provide at least the same level of fire resistance as the element of construction in which it is located.

1.4 Any opening between the kitchen and a servery should be protected by a shutter with a fire resistance of the same standard as that of the kitchen enclosure. The shutter should be designed to lower automatically in the event of a fire and be closed outside working hours to prevent unauthorised access to the cooking equipment.

1.5 Doors leading from the cooking area to other rooms or escape routes should have at least 30 minutes fire resistance and be fitted with self-closing devices.

1.6 An adequate area should be provided in the kitchen to allow for the safe movement of staff and their escape in an emergency. This area should be kept clear of obstructions.

1.7 Adequate means of access and clearance should be maintained around cooking equipment for cleaning and maintenance purposes.

1.8 Any appliance where oil or fat is used for cooking should not be located immediately beneath water pipes. Sprinklers should not be installed where the discharge may come into contact with hot cooking oil.

2 Installation

2.1 The installation of cooking equipment should be fully in accordance with the manufacturers' instructions.

2.2 The connection of the equipment to the power or gas supply should be carried out either by the manufacturer or by a reputable contractor.

In the case of electrical appliances the contractor should be on the roll of the National Inspection Council for Electrical Installation Contracting (NICEIC) or be a member of the Electrical Contractors' Association (ECA).

In the case of gas equipment the contractor should be on the list of the Confederation for the Registration of Gas Installers (CORGI).

2.3 All electrical equipment should be installed in accordance with the current edition of British Standard BS 7671[1] (formerly the IEE Wiring Regulations).

2.4 Where heating is by liquefied petroleum gas, the relevant parts of the Recommendations for the storage, use and handling of common industrial gases in cylinders[2] should be complied with.

2.5 Fuel pipes and electrical equipment should be sited so that they are not susceptible to the effects of heat, water vapour, grease or mechanical damage.

2.6 Means should be provided for the emergency shutdown of power, fuel supply and the extraction system to all cooking equipment. The emergency shutdown device should be clearly labelled (and be readily accessible), adjacent to the main escape route.

2.7 On deep fat fryers the ranges should be equipped with a separate high temperature limit control, of a non-self-resetting type, to shut off the heat source should the temperature of the fat exceed 230°C. This high temperature limit device shall not operate the same gas valve as any automatic temperature control.

3 Extraction systems

3.1 Mechanical extract ventilation should be provided for all cooking equipment producing heat, fumes and products of combustion.

3.2 Extraction should be via an overhead canopy and ducting system that discharges to the open in such a manner whereby grease will not be deposited on the building or adjoining properties.

3.3 Hoods, canopies and ducts should be constructed of, and supported by, galvanised or stainless steel of a substantial gauge, having all seams and joints liquid-tight, with smooth surfaces to facilitate cleaning.

3.4 Lighting provision under canopies need to be selected for its suitability in the presence of heat and grease.

3.5 Extract ducting should be as short as practicable and the design should comply with any local byelaws. The duct should preferably pass directly to the open and should not pass through, or be contained within, floor or ceiling voids, or roof spaces where exposed combustible materials are present.

3.6 Bends or dips in the design of the ductwork where residues might collect are to be avoided and the whole of the ducting should be accessible for cleaning. At each change in direction of the duct an opening with a grease-tight cover should be provided for inspection and cleaning.

3.7 In those cases where it is not possible to install the ducting as indicated in paragraphs 3.5 and 3.6, it should be enclosed in a service shaft of non-combustible construction having a fire resistance of at least 30 minutes and with access points to facilitate cleaning of the extract ductwork throughout its length.

3.8 Where ducts pass through any combustible material, such material should be cut away for a distance of at least 150mm from the duct and the space filled with non-combustible insulation. Ducts, hoods and canopies should have a clearance of at least 150mm from combustible material, including combustible partitions and floors and, where necessary, should be protected with a non-combustible insulating material.

3.9 Filters, traps or other grease removal devices should be provided; a residue trap should be installed at the base of any vertical riser. These devices should not be sited where they are liable to be exposed to direct flame impingement or hot flue gases. The distance of the grease removal devices from the heat source should not be less than 500mm unless there is suitable protection, for example by a steel baffle plate.

3.10 All grease-removal devices, including their frames, should be constructed of non-combustible material and installed in the extract ducting or canopy in a readily accessible position to facilitate cleaning and be as close as possible to the appliance.

3.11 Grease removal devices should, preferably, comply with appropriate standards and be approved by third party accreditation. (For example LPS 1263 which is currently in preparation.)

4 Housekeeping

4.1 Cleaning of the surfaces of all cooking equipment hoods and canopies, ductwork, fans, burners and fixed fire extinguishing equipment should be carried out at frequent intervals to prevent contamination by grease or oil. Grease tends to accumulate at specific points and particular attention should be given to cleaning concealed areas formed by corners and lips.

4.2 Frequent cleaning of filters or other grease removal devices is particularly important. Cleaning intervals depend on the type of equipment and the extent of its use and should be in accordance with the current best practice.

4.3 Cleaning of filters etc does not remove the need for the periodic inspections of the inside of ductwork and the extraction motor to check for build-up of grease deposits. Cleaning should take place at intervals not exceeding 12 months, preferably by specialist contractors. This may require the cutting of openings in the ductwork if none have been provided (see section 3.7). Such cutting of openings should only be carried out by a suitable method after an appropriate risk assessment.

4.4 Flammable solvents or other flammable based cleaning aids should not be used.

4.5 Spare butane cartridges for flambé lamps and chefs' blowlamps should be stored securely outside the kitchen.

5 Operating instructions

5.1 Cooking appliances should be operated and serviced in accordance with the manufacturers' instructions.

5.2 Operators should be thoroughly instructed in the correct use of the equipment and the danger of ignition from the overheating of fats.

5.3 Cooking ranges should be equipped with devices to ensure that the gas or electricity cannot be supplied when the extraction system is not in operation.

5.4 Filter equipped extraction systems should not be operated with the filters removed.

5.5 Cooking equipment should not be left unattended whilst the heat source is operating.

5.6 The power or fuel supply should be shut off outside working hours. Where LPG equipment is installed the gas should be turned off at the cylinder(s), which should be located outside the building[2].

5.7 In the case of deep fat fryers, caution should be exercised when changing or replenishing the pan(s) with fat to prevent spillage or overfilling, especially while the apparatus is hot.

5.8 The cooking oil level in the pan(s) should be maintained within the manufacturer's recommended minimum and maximum levels for safe operation. The minimum level should be such that under no circumstances is the temperature sensing device or the electrical heating element exposed during operation.

6 Fire protection

6.1 Operators should be thoroughly instructed as to the hazards associated with fighting cooking oil and fat fires.

6.2 Operators should be made familiar with the operation and correct method of use of portable fire extinguishing appliances and any fixed fire extinguishing system.

6.3 A notice showing the action to be taken in the event of fire should be prominently displayed in the cooking area. In particular, the notice should require the prompt shutdown of the heat supply and extraction system.

6.4 It is recommended that a suitable fixed extinguishing system, installed by an LPCB certificated[3] fixed system company, should be provided, with both manual and automatic operation, to protect cooking equipment, overhead canopy and ducting system. The operation of the fixed system should automatically shut down the heat supply and extraction system.

6.5 Portable fire extinguishing appliances should be provided throughout the premises in accordance with British Standard BS 5306: Part 8[4]. A minimum of two portable fire extinguishers, carrying a British Approvals for Fire Equipment (BAFE) or Loss Prevention Certification Board mark, should be provided in the cooking area. Where deep fat fryers are in use one of these should be a Type F extinguisher as defined in BS 7937[5]. Other extinguishers provided should be appropriate for use where electrical equipment is in operation.

6.6 At least one fire blanket[6] should be available.

6.7 All firefighting equipment should be easily and safely accessible.

6.8 An outbreak of fire involving burning gas should only be controlled and not extinguished until such time as the gas supply has been shut off.

Gas safety

If gas is smelled on the premises:

- shut down frying and other gas fuelled appliances promptly and safely
- turn the gas supply off at the main stopcock
- put out all naked flames
- open doors and windows to ventilate the building
- in the case of a leak of mains gas call Transco for assistance on their 24 hour emergency line: 0800 111999
- keep people away from the area(s) concerned
- do not search for gas leaks with naked flames
- do not smoke where there is a smell of gas
- do not operate electrical switches.

If the leak is from the supply pipes Transco will advise regarding its repair; if it is from the appliance the service agent or a CORGI registered engineer may have to be called.

In the case of a gas cylinder that continues to leak after the valve has been shut the supplier should be contacted for advice.

Electrical safety

If damage is visible to electrical equipment in the kitchen, or the plug or flex associated with the item, it should be switched off and unplugged (in the case of portable equipment). The damage should be reported to someone in authority and the appliance not be used again until suitable remedial action has been taken.

References

1. BS 7671: 2001: Requirements for electrical installations. IEE Wiring Regulations, 16th edition.
2. Recommendations for storage, use and handling of common industrial gases in cylinders, RC8. Fire Protection Association, 2003.
3. Requirements for firms engaged in the design, installation and commissioning of fire fighting systems, LPS 1204, Issue 2. Loss Prevention Council, 1994.
4. BS 5306: Fire extinguishing installations and equipment on premises: Part 8: 2000: Selection and installation of portable fire extinguishers. Code of practice.
5. BS 7937: 2000: Specification for portable fire extinguishers for use on cooking oil fires (class F).
6. BS 6575:1985: Specification for fire blankets.

Additional reference material

LPGA CoP 3 Recommendations for prevention or control of fire involving LPG.

LPGA CoP 7 Storage of full and empty LPG cylinders and cartridges.

LPGA CoP 15 Valves and fittings for LPG service.

LPGA CoP 22 LPG piping system design and installation.

The above guides are published by the LP Gas Association.

Recommendations for fish and chip frying ranges, RC16A, Fire Protection Association, 2003.

The LPC Design Guide for the Fire Protection of Buildings 2000, FPA 2000.

Gas Safety Regulations 1972, SI 1972, No 1178, HMSO.

List of approved fire and security products and services, published annually by the Loss Prevention Certification Board.

Addresses of organisations referred to in these Recommendations

Council for Registered Gas Installers (CORGI)
1 Elmwood
Chineham Business Park
Crockford Lane
Basingstoke
Hants RG24 6WG
Tel: 01256 372200
Fax: 01256 708144
Web: www.corgi-gas.com

Electrical Contractors' Association (ECA)
ESCA House
34, Palace Court
London W2 4HY
Tel: 020 7313 4800
Web: www.eca.co.uk

Loss Prevention Certification Board (LPCB)
Garston
Watford
Herts WD25 9XX
Tel: 01923 664100
Fax: 01923 664994
Web: www.brecertification.co.uk

LP Gas Association (LPGA)
Pavilion 16
Headlands Business Park
Salisbury Road
Ringwood
Hampshire BH24 3BP
Tel: 01425 461612
Fax: 01425 471131
Web: www.lpga.co.uk

National Inspection Council for Electrical Installation Contracting (NICEIC)
Vintage House
37 Albert Embankment
London SE1 7UJ
Tel: 020 7564 2323
Fax: 020 7564 2370
Web: www.neceic.org.uk

Transco

24 Hour emergency line for reporting gas leaks: 0800 111999