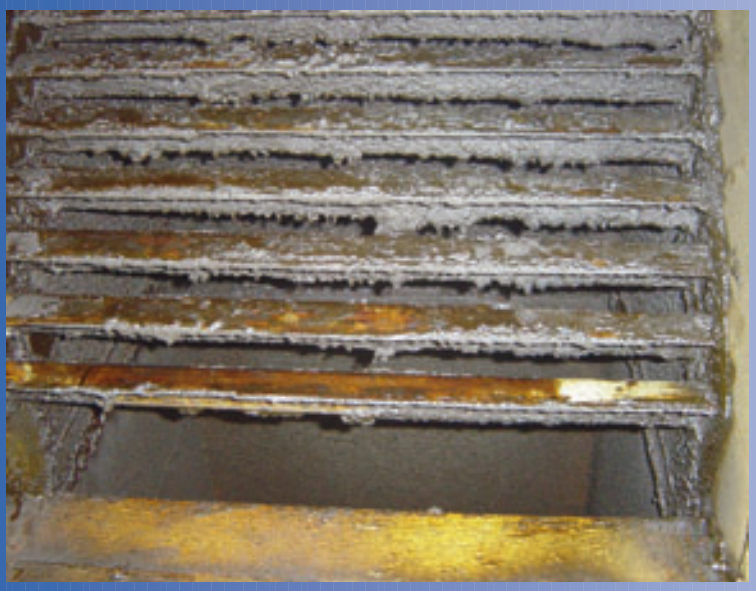
Recommendations

RC44



for fire risk assessment of catering extract ventilation

FPA Fire Protection Association

InFiReS

BSRIA

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Cover illustration: a grease-laden filter, picture reproduced by courtesy of Indepth Hygiene.

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Contents

Scope

This publication provides for a fire risk assessment of extract ventilation in catering kitchens together with supporting explanation and guidance. It is aimed principally at the person responsible for ensuring that such an assessment is performed. It explains the legislative background to the need to carry out and record the findings of fire risk assessments

Fires can start anywhere in kitchens. Their consequences can be severe if the conditions in ventilation ductwork permit fires to spread out of control as a result of the ignition of grease which has been allowed to build up within the ductwork.

The document provides background information on the grease residues that can result from different styles of cooking and on the main components of extract systems. It emphasises the importance of regular cleaning in order to keep to an acceptable minimum the build-up of grease deposits in kitchen extract ductwork. It gives guidance on carrying out a fire risk assessment of such ductwork as just one aspect of an evaluation of fire hazards in a catering kitchen.

The five principal stages of an assessment are considered, combining appropriate information with relevant questions, while the Appendix repeats the questions within a table which is suitable for use every time the assessment needs to be repeated.

The publication is essential reading for those responsible for the performance of a fire risk assessment in any catering kitchen and will be of interest and value to many other people, including:

- insurance surveyors;
- local authority environmental health officers;
- facilities managers;
- risk managers;
- health and safety officers; and
- fire and rescue service inspection staff.

1 Introduction

The Regulatory Reform (Fire Safety) Order 2005 introduced the role of 'responsible person' and has firmly transferred the onus of fire safety in England and Wales from the prescriptive approach (overseen by the fire authority) to a new approach based on risk assessment, where the person responsible for the premises needs to decide how to address the hazards. Similar legislation will apply in Scotland and in Northern Ireland, paralleling the risk-assessment based approach.

Every business which employs people must carry out a fire risk assessment; if you employ five or more people then you must record it. The significant findings of the fire risk assessment and any persons at special **risk** must be documented. An assessment of fire risks should form part of the risk assessment for the premises as a whole.

The Responsible Person

The responsible person is the employer and any other person who may have control of any part of the premises, such as the occupier or the owner. If there is more than one responsible person for the premises, such as multi-tenure and contract caterers, the relevant people must take reasonable steps to work together to minimise risk.

The responsible person's duties will include:

- ensuring a fire risk assessment is carried out;
- producing a policy;
- developing procedures;
- providing staff training;
- organising fire drills;
- providing and maintaining clear escape routes and exits, with appropriate emergency lighting;
- checking the compartments and doors necessary to reduce the spread of fire and smoke;
- providing appropriate signs and notices to aid evacuation;
- providing fire detection and alarms; and
- providing and maintaining extinguishers and any other equipment.

Essentials of risk assessment

- identify hazards;
- remove if possible;
- replace if possible;
- reduce if possible;
- manage the residual risk.

This fire risk assessment should be conducted by the **responsible person** or nominated **competent person** and will help you identify potential **hazards** associated with **kitchen extract ventilation,** principally those created by inadequate cleaning regimes leading to excessive build-up of cooking oil deposits. You should evaluate the hazards, record the findings and keep the assessment under review, particularly if there are any changes made to the ventilation system.

If deposits of grease are allowed to build up in kitchen extract ducting, the introduction of an ignition source may lead to the deposits becoming ignited, causing fire to spread rapidly through the complete ducting system. Such fire can spread to other parts of the building and the resulting property damage could lead to lengthy and costly remedial work, with considerable interruption of the business operation.

This document represents the best account of available knowledge but it is recognised that there are developing new technologies which can help reduce the build-up of **grease** and aid the cleaning of ductwork. Use of such technologies does not reduce the legal obligation to undertake the fire risk assessment.

By following all the measures presented later, you will make your workplace a much safer and more comfortable place to work. Also bear in mind that if you do not take suitable precautions, then in the event of personal injury or death resulting from a fire associated with a poorly maintained system, charges of corporate liability or manslaughter may be brought against the responsible person.

Many insurance policies contain specific conditions, relating to regimes of cleaning. If a fire occurs in kitchen **extract ventilation** and can be shown to be associated with inadequate cleaning of ductwork then it could jeopardise the right to indemnity for loss or damage under the relevant policy.

Failure to satisfy inspections by statutory enforcement authorities (such as fire and environmental health authorities) can lead to closure of your business and even prosecution.

2 Definitions

The following explanations apply to terms used in this publication. The first use of such a term is indicated by **bold type.**

Access door: A door providing access into **ducts** for maintenance or inspection.

Capable person: Someone who, by reason of theoretical or practical training or by practical experience, is able and authorised to perform a task or assume responsibility.

Class F fires: Fires in cooking appliances involving cooking fats and oils.

Cleaning schedule: A document containing information on how and when cleaning is carried out and what equipment and chemicals are used.

Competent person: A person with enough training and experience or knowledge and other qualities to enable them properly to assist in undertaking a fire risk assessment.

Competent specialist contractor: A specialist contractor possessing the necessary skills to certify their own work.

Detergent: Substance which on its own or in combination with others, in water, assists cleaning.

Duct: A circular or rectangular metal enclosure which connects the extract canopy, hood or grille with the outside of the building. Ducts, canopies, extract plenum and hoods 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.

Extract plenum: The space in the canopy normally after the grease filters but before the duct.

Extract ventilation: Ventilation by which the air is discharged to atmosphere.

Fire suppression system: An active system which operates to detect and suppress a fire. Such a system shall have been tested and approved to an appropriate standard, such as LPS 1223 (ref. 1), by an independent, third-party approvals organisation.

Flashpoint: The minimum temperature at which material gives off a vapour which will ignite on exposure to an ignition source under specific test conditions.

Grease: The residue of by-products from cooking. A variable mix of animal fats/oils, vegetable oils, water vapour, ash, carbon, dust, flour and other particles.

Hazard: Substances, equipment or methods of work with the potential to cause harm, such as death, injury, property damage and/or business interruption.

Hood: A metal box containing filters, intended to collect contaminated air from above a cooking appliance.

Responsible person: A person named in writing who will be held to account for ensuring that fire risk is properly managed and who must ensure the safety of employees and anyone else who could be affected by the fire.

Risk: The chance, high or low, of harm occurring.

3 Grease deposits and fire hazards

Different cooking styles will create different **grease** residues:

- oriental cooking creates a very sticky, syrup-like grease that can become firmly attached to metal surfaces. The surface tension cannot be broken by normal scraping or with general purpose cleaning chemicals;
- solid fuel cooked/charbroiled meat creates large quantities of grease. A first layer of grease will bond to metal surfaces and then additional layers of thick, heavy black carbon will build up, containing ash and grease from the cooking process;
- deep frying creates a grease similar to translucent creosote;
- frozen foods containing large quantities of water create a hard shiny layer of grease.

There is no difference in the **hazard** posed by different types of cooking oil or fat although the following should be borne in mind:

- safe cooking with oils and fats is usually at temperatures below 200°C. Flammable vapours are given off at 200/300°C and spontaneous ignition occurs at 310-360°C;
- the **flashpoint** of cooking oil is reduced by progressive oxidation through repeated use;
- deposits of some mixtures, such as chicken fat and vegetable oil, ignite quite readily.

By following this assessment and reducing the identified hazards, you will:

- keep to an acceptable minimum the build-up of grease deposits within the kitchen extract ventilation;
- reduce the risk of spreading fire;
- reduce the growth of bacteria and odour;
- improve airflow through the kitchen;
- reduce fire hazards which will avoid the associated business loss and liabilities in the event of a fire;
- find it easier to get affordable insurance.

4 System components

A kitchen extract system (see Figure 1) serves three separate and distinct functions:

- to act as a fire-protection device by removing the fuel source for fire, namely grease;
- to remove smoke, heat, vapours and odour from the cooking area;
- to provide safe and comfortable conditions for the kitchen staff.

Kitchen **extract ventilation** (see Figure 2) operates in the following way:

A percentage of cooking oil is formed into vapour, which travels upward, propelled by thermal currents where the draw of the extract fan pulls the air through a grease-removal device (filters) and the remainder of the system (ducts) thus expelling cleaner air into the environment. The key components of a system may include:

- **hood** or canopy;
- filter;
- **extract plenum;**
- **duct;**
- fan.

For an explanation of correct system design refer to the Heating and Ventilating Contractors' Association's (HVCA) specification for kitchen ventilation systems (ref. 2).

5 The risk assessment

Stage 1: Identifying ignition hazards

Many cooking appliances represent a potential source of ignition. Such appliances include gas-fired equipment with an immediate source of flame, deep fat frying apparatus, and also electric appliances such as toasters, fryers and griddles.

Fuel is available in a number of forms including:

- oil/fat and food products;
- combustible materials adjacent to exhaust ducts;
- the power supply to the apparatus for example, gas supply.

Air is supplied in large quantities by the inlets of the ventilation system and extract ducts can act as chimneys, increasing the intensity of any fire.

The primary fire hazards in a kitchen

- Cooking equipment left unattended during operation
- Individual equipment not switched off, especially at the end of a cooking session
- Poor maintenance of all equipment and systems
- Flames, sparks or hot gases from cooking which can ignite combustible deposits inside extract ducts
- Overheated oils, leading to spontaneous ignition

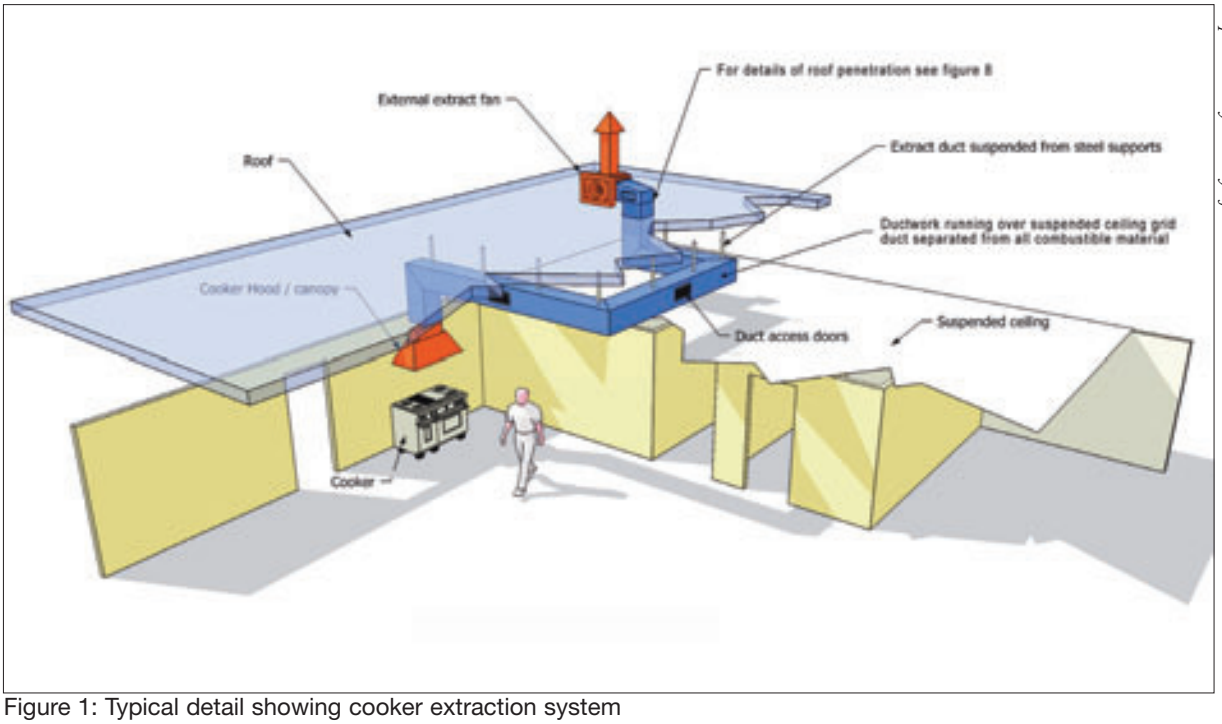

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Figure 1: Typical detail showing cooker extraction system

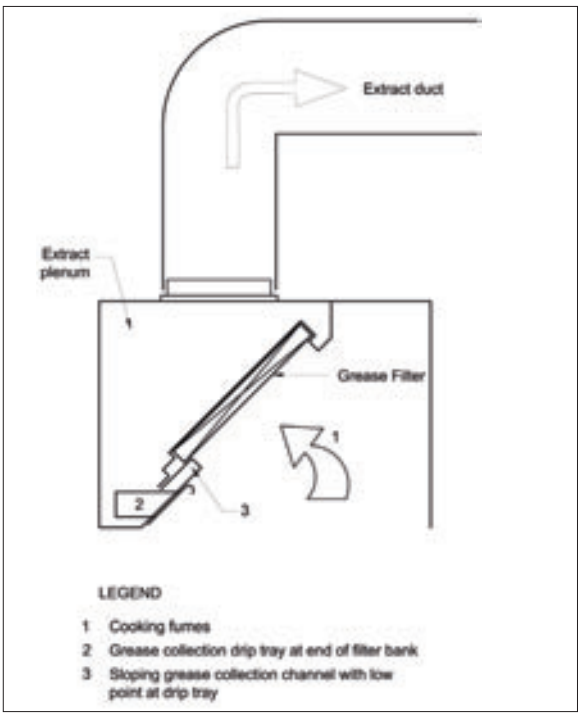

Figure 2: Typical airflow through filter housing

- Fan-motor failure or overheating caused by hardened grease when restarting in seasonal catering establishments, or non-24-hour operations
- Thermostats not working correctly and/or the absence of a second, high-level safety thermostat
- Metal extract ducts are good conductors of heat and can ignite adjacent materials or litter
- Catalytic converters decompose grease but operating at 1000°C are a potential source of ignition
- Solid fuel cooking equipment (such as barbecues, charcoal grills)
- The use of burning pieces of paper to light Tandoori ovens
- Absence of flame failure or safety shut-off device in appliances
- Gas torches used to brown some dishes.

Additional risk factors

- Lack of a **capable person** on site
- Human error
- Combustible food debris trapped in the grease filter
- Lack of knowledge about the extract ventilation
- Faulty or non-tested electrical appliances
- Design aspects of the extract ventilation, such as length of ducts, length of horizontal ducts, type of fan, type and number of duct access panels
- Cleaning contracts may only cover hoods and easily accessible visible areas, for example only those areas inside the ducting which are within arm's reach
- Level of **competence** of cleaning contractor
- Remnants of paper napkins or other combustible waste oddments which may have been inadvertently left in cooker hoods or inside the extract ducting etc
- Poor siting and/or maintenance (or absence) of fire suppression system
- Poor cleaning maintenance practice may compromise fire protection cladding or fire-rated access panels on ducts
- Extract ducts are often completely inaccessible, for example in older buildings some duct systems may be routed inside masonry chimney breasts
- Unsuitable ductwork for kitchen environment
- Insufficient number of **access doors** in ductwork to permit effective inspection and cleaning
- Grease filters left out during cooking.

Stage 2: Risk assessment

This stage suggests a relative ranking to help you rate fire risk as either low (L), normal (N) or high (H). The scores in each section should not be compared, as the subjects are quite different. The ranking is indicative to help you through the process to reduce the risks. As far as possible you should try to increase the number of (L) scores that apply to your premises.

Cooking style and equipment

The following ranks the risks associated with type of cooking and equipment.

- ❑ Boiling with no risks of oil or grease vapour (L)
- ❑ Conventional frying or processes emitting steady vapour flow (N)
- ❑ Open flame grilling, flame cooking and sudden emissions of hot vapour (H).

Capable persons

Is a capable person on site at all times?

- ❑ Yes (L)
- ❑ Sometimes (N)
- ❑ No (H).

Staff knowledge and training

An important issue to bear in mind is that if staff are tired, overworked and undervalued, this can create risks. Long hours and late finishes could tempt staff to skimp

on cleaning or to leave it until later, while a feeling of being undervalued can lead to indifference and poor performance. Staff will feel valued if they are well trained.

Your staff training should include the following:

- Understanding the risks of grease and other cooking deposits in ductwork
- Understanding how grease atomises
- Knowing how to handle and use commercial cleaning chemicals
- Familiarity with drawings showing the routing of extract ducts, if appropriate
- Knowing how to isolate the extract fan
- Knowing the correct method and frequency for cleaning grease filters
- Knowing that grease filters should not be removed while the extract ventilation is operating
- Knowing that all appliances should be switched off individually and not at the mains
- Instructing staff to report faulty controls, sensors and indicating devices
- Understanding of how to fight cooking fires and including fire suppression, especially those involving deep fat frying
- Knowing about fire detection and extinguisher systems
- Safe handling of cooking oils and fats
- Safe operation of cooking appliances
- Knowing how to switch off the power supply to cooking apparatus in an emergency.

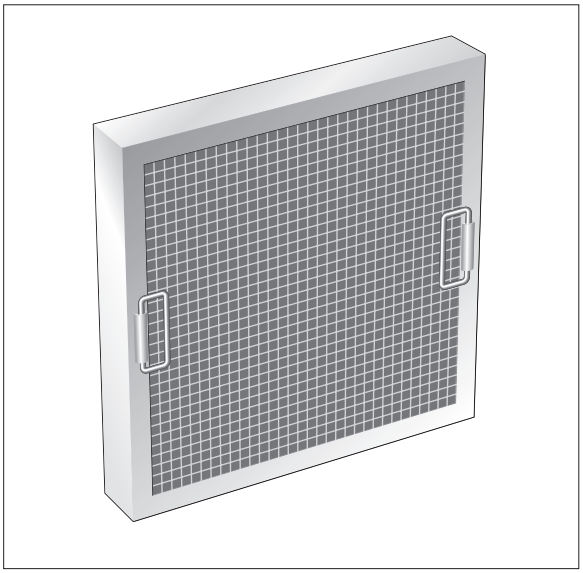

Figure 3: A mesh filter

Figure 4: A baffle filter

Figure 5: A cartridge filter

Figure 6: A water wash filter

Training should be given and repeated as necessary, and records kept of the training given.

How many of your staff understand the systems and processes they are working with?

❑ All staff (L)

❑ Supervisor (N)

❑ No staff (H).

Inspections

How frequently are regular visual checks of the whole extract ventilation system made by a competent person?

❑ Monthly (L)

❑ Six-monthly (N)

❑ Annually or never (H).

Grease filters

The primary purpose of grease filters is to reduce the amount of grease passing through into the ductwork. Better filters may therefore reduce the frequency and extent of cleaning. It is essential that all grease filters be in place whenever cooking appliances are operated.

Different types of grease filters may be used within the cooker hood:

- Mesh filters (Figure 3) are low cost and contain a number of layers of material in a stainless steel or aluminium frame. Grease is deposited on the mesh and such filters are only suitable where low quantities of grease are produced. They have a limited life and need to be cleaned at least once a week. Having no flame protection they should not be used where there is a high risk of fire.
- Baffle filters (Figure 4) comprise a number of interlocking vanes, which form a two-pass grease removal device and a barrier in the event of a flash fire. Grease-laden air passes through the filter by a series of forced changes in direction and speed; some of the grease becomes separated in the air stream and is deposited on the vertical vanes. Deposited grease is drained off into a collection drawer which has to be regularly cleaned.
- A cartridge filter (Figure 5) has a slot opening onto a series of baffles that cause multiple direction changes to the air flow. Trapped grease falls through a drain to a grease tray.
- Water wash filter (Figure 6) systems clean by spraying the interior of the canopy extraction chamber with pressurised hot or cold water sometimes automatically injected with a predetermined amount of **detergent**. Some have continuous cold water spraying to change the characteristics of the grease so that it drops into a drainage system. These systems can reduce fire risk in solid fuel appliances where hot embers could be drawn up into the hood.

The table below indicates the relative safety scores assuming regular cleaning and maintenance is undertaken.

Type	**Risk**
Mesh	High (H)
Baffle	Normal (N)
Cartridge	Normal (N)
Water wash	Low (L)
Cold water mist	Low (L)

Are grease filters in place?

❑ Yes (L)

❑ No (H).

Do the filters comply with a recognised performance standard such as LPS 1263 (ref. 3)?

❑ Yes (L)

❑ No/Not known (N).

If you want continuous running of the system, do you have two sets of grease filters to enable a clean filter to be fitted when the dirty one is removed for cleaning?

❑ Yes (L)

❑ No (H).

Duct accessibility

Although there are systems that can clean ductwork remotely, thus reducing the need for access, greater flexibility in cleaning methods is available if the ductwork is easily accessible.

Unless remotely controlled cleaning has been used, it is reasonable to assume that inaccessible ductwork has not been cleaned and is therefore dirty.

Can ducts be easily and safely reached?

❑ All (L)

❑ Some (N)

❑ None (H).

Are there other services beneath the ductwork that would hinder easy access for cleaning?

❑ None (L)

❑ Some (N)

❑ Yes (H).

Duct access doors

Access doors should be as large as possible (to a maximum size of 460 × 610mm in most circumstances) and made to the same acoustic, thermal and fire insulation properties as the ductwork. They should be fitted to the side of ductwork, not the base, to prevent grease leaking out, at a maximum of 3m centres and positioned either side of any internal equipment, and at changes of direction.

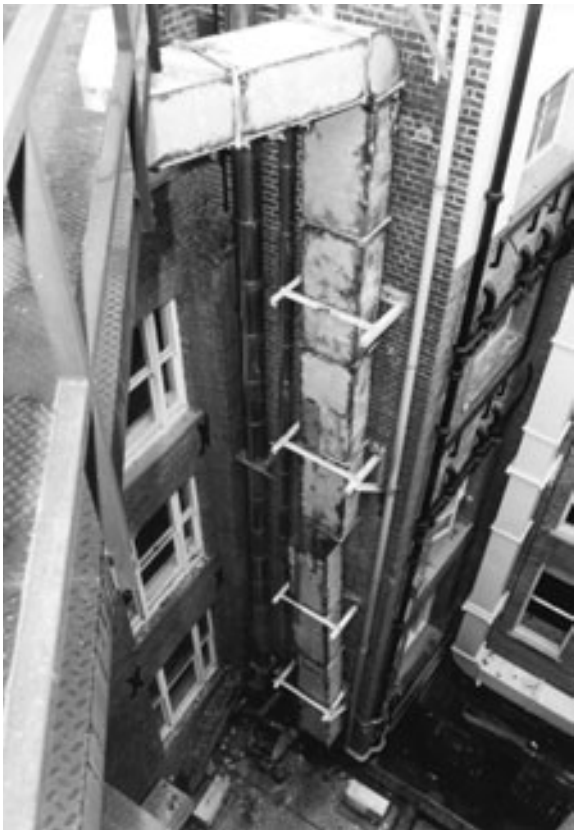

Figure 7: Broken ductwork

Are there enough access doors throughout the length of all ducts to reach all parts of the interior of the duct?

- ❑ Yes (L)
- ❑ No (H).

Are they quick release fixing?

- ❑ Yes (L)
- ❑ No (N).

Are they leaking grease?

- ❑ No (L)
- ❑ Yes (H).

Duct cleanliness

To minimise the risk of grease building up, ductwork should be taken by the shortest and most direct route to atmosphere with a minimum number of bends (see Figure 8). A schematic drawing of the installed ductwork, showing access doors, should ideally be held by the kitchen operator to aid the cleaning process and to help the fire services in the event of a fire.

Kitchen extract ductwork must remain separate from other ventilation systems. Where kitchen extract ducts have to pass through other parts of the building they should be contained within a separate outer duct having the same standard of fire resistance as the kitchen, or the parts of the building through which it passes, if these are higher.

The length of ductwork installed outside the building should be kept to a minimum because the effect of cold weather will increase the rate of grease and fat condensing and solidifying inside the duct. Where this is unavoidable, ducts should be vertical and insulated.

Fire-resisting dampers must not be installed in kitchen extract ductwork. Grease deposits will prevent damper operation and the dampers will prevent proper cleaning.

Where ducting systems run within areas not controlled by the operator the responsible person must ensure that they liaise with the responsible persons for those other areas, make them aware of any associated risks and inform them when cleaning and maintenance activities are planned.

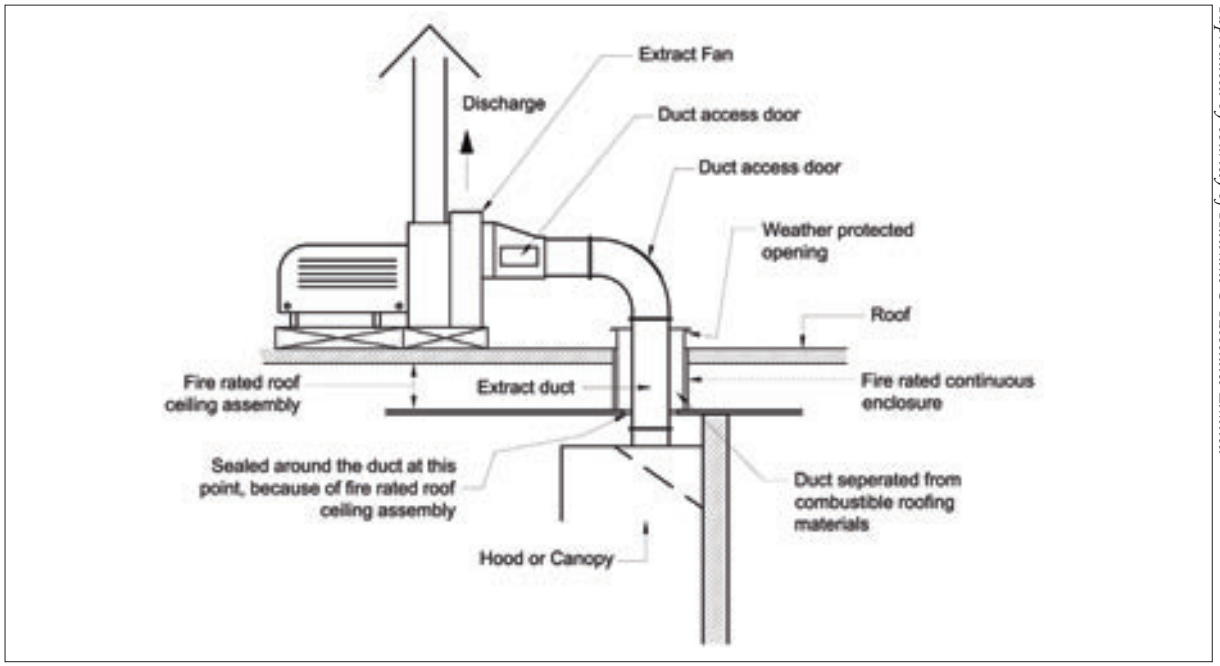

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Figure 8: Typical section detail showing wall/roof penetration for a cooker extraction sytem

How is cleanliness/dirtiness established or measured and compared with published good practice benchmarks? (ref. 4)

❑ Physical measurement (L)

❑ Internal visual inspection (N)

❑ External visual inspection (H).

Route of the ducts

Do you have vertical extract ducts more than 4m high?

❑ No (L)

❑ Yes (N).

Are bends in ductwork accessible?

❑ Yes (L)

❑ No (H).

Where there is ductwork installed outside the building, is it included in the cleaning regime?

❑ No (H)

❑ Yes (N).

Is there non-combustible easily cleanable protection to the roof covering at the duct termination?

❑ Yes (H)

❑ No (N).

For larger buildings or those under multiple occupancy, do you have drawings depicting the extract ventilation?

❑ Yes (L)

❑ No (N).

Are the drawings available if needed by the local fire service?

❑ Yes (L)

❑ No (N).

Factors affecting frequency of system cleaning

Your insurer and the environmental health officer would expect you to have a routine of regular cleaning. It will also reduce the likelihood of grease deposits baking and hardening on duct surfaces. In addition to regular ductwork cleaning, you must remember to attend to some cleaning every day and clean hoods, filters and associated drains and traps at least as frequently as recommended by the manufacturers.

- The level of use of the cooking equipment:
  - Heavy use (12-16 hours per day): three-monthly cleaning suggested;
  - Moderate use (6-12 hours per day): six-monthly cleaning suggested;
  - Light use (2-6 hours per day): 12-monthly cleaning suggested (ref. 4)
- Vulnerability to ignition
- Hygiene, vermin and mechanical hazards
- Seasonal catering establishments should have the system cleaned at the end of the season. It is particularly important to ensure fans do not become jammed against solid grease. It is advisable to check systems before restarting at the commencement of the season.

Frequency of cleaning

The frequency of cleaning the internal surfaces of the entire length of the extract ductwork should be based on a considered risk assessment. The best way of doing this is by measuring the quantity of grease deposited on the duct surface and establishing the rate of build-up (ref. 4).

Where this is impractical, then initial cleaning frequency should depend on the level of use, as discussed above. Thereafter, 'before and after' dirtiness and cleanliness measurements will permit the frequency to be adjusted to suit the actual observed hazard and may reduce expenditure on unnecessary cleaning.

- How frequently do you clean the whole system?
- How frequently do you clean parts of the system?
- How is complete cleanliness verified?

Ventilation system cleaning regime

Catering equipment is usually cleaned before cooking begins or, preferably, at the end of the working day so that the equipment is left clean overnight. Staff may be tired at the end of their working day, however, and tempted to take shortcuts, so close supervision will be necessary (ref. 5).

Are there enough access doors to enable the entire length of the internal and external surfaces of the ductwork including fans to be inspected and cleaned?

❑ Yes (L)

❑ No (H).

Does your premises have a kitchen extract system **cleaning schedule**?

❑ Yes (L)

❑ No (H).

Are your staff trained to clean grease and oil from the hoods, filters and grease trays on a regular schedule?

❑ Yes (L)

❑ No (H).

Do you employ a **competent specialist contractor** to clean the extract ventilation system?

❑ Yes (L)

❑ No (H).

Is a report produced after cleaning has been carried out?

❑ Yes (L)

❑ No (H).

Have you inspected the cleanliness of the ducts via the filter housings and access doors to check on the effectiveness of a contractor's clean?

❑ Yes (L)

❑ Obtained photographic evidence (N)

❑ No (H).

Checklist

The following checklist should form part of an operating and maintenance schedule that will keep your system in a safe condition. Some of these tasks may be performed by competent kitchen staff; otherwise a competent specialist contractor should be employed. In any case the following best practice should be used.

Daily

- Check detergent container and fill if necessary
- Clean parts of hood visible from within the kitchen
- Check the grease drip tray, drain and clean as required.

Weekly

- Remove and clean grease filters (more frequently under heavy operation).
- Soak filters in a detergent solution, preferably overnight, and rinse with a pressure washer or clean in a dishwasher. Note that baffle filters must be replaced with the baffles running vertically.
- Check the grease tray for build-up and clean out using rags. Check for other debris.
- Remove access doors on hood and inspect the interior with a torch. Visible deposits should be removed as far as possible (but note that this is not a substitute for regular cleaning of the entire system).

Monthly

- Where fitted, inspect fire suppression operating mechanisms for grease build-up
- Check all water nozzles for blockages.

Quarterly

- Clean the extraction fan blades.

Annually

Employ a competent specialist contractor to:

- Examine and report on the condition of the ductwork
- Inspect the hood and fan for proper operation and air flow
- Report on grease build-up detected
- Advise on the perceived effectiveness of the cleaning regime
- Provide a report and recommendations about the extent and frequency of localised cleaning.

Take account of the specialist contractor's recommendations and record the actions that have been taken. Revise the risk assessment, if appropriate, to positive effect for the safety of the premises.

Good housekeeping

- The frequency of local visual inspections (that is just behind grease filters) will depend on the cooking process and hours of operation but should be at least weekly
- All metal surfaces should be checked for accumulated grease or dirt
- It is ineffective to create so-called 'fire breaks' by cleaning small areas around access panels
- The insides of all filter housing and grease collection trays should be cleaned weekly
- Extract ducts should be cleaned by a competent specialist contractor (ref. 4)
- Only suitable metal cleaning products should be used. Caustic or abrasive materials may damage metal surfaces and provide a breeding ground for bacteria
- Where removable filters are fitted, they should only be removed when the system has been shut down, to prevent unfiltered air entering the ducts. These filters may be put in a dishwasher or hand washed to remove grease.
- Cartridge filters having integral grease collection reservoirs should be cleaned at least twice a week.
- An **extract plenum** behind filters is part of the design and grease collected in this area should be removed by regular cleaning at least twice a week.

Fire suppression systems

A properly designed and installed fire detection and suppression system can help prevent the spread of fire into a duct, and thereby prevent secondary fires from breaking out elsewhere. If good means of escape and other fire precautions are provided, the primary purpose of an automatic fire suppression system will be to reduce property damage. Nevertheless, a risk assessment of the specific circumstances might indicate that an automatic fire suppression system would also help to protect people in the kitchen or in rooms through which ductwork passes.

During any cleaning process, care should be taken not to damage fire suppression operating mechanisms (such as fusible links) located in the ductwork.

Liquid chemical agent fire suppression systems and portable fire extinguishers are preferable since they give a greater level of cooling, seal the oil surface and prevent re-ignition.

Care in cleaning is necessary to protect nozzle covers while ensuring that any blockages are removed.

Dry powder systems are more suitable for use on shallow frying or grilling equipment.

Carbon dioxide systems are suitable in only a few special circumstances and should not normally be fitted.

Special water mist systems are available. However, under no circumstances should any other water system be used.

A maintenance contract in accordance with manufacturer's instructions should be in place for the system.

Is fire suppression fitted to the extract ventilation?

❑ Yes (L)

❑ No (H).

What kind of fire suppression system is installed?

❑ Water mist (L)

❑ Wet chemical (L)

❑ Dry chemical agent system (N).

Is the fire suppression system approved under a recognised performance standard? (ref. 1)

❑ Yes (L)

❑ No (H).

Do you have portable fire extinguisher(s) suitable for use on cooking oil fires? (ref. 6)

❑ Yes (L)

❑ No (H).

Do you have a service and maintenance contract for the fire suppression system and portable fire extinguishers?

❑ Yes (L)

❑ No (H).

Stage 3: Evaluate the hazards

Remember the essential stages of a fire risk assessment:

- identify all the hazards;
- remove where possible;
- reduce if possible;
- replace with a safer alternative;
- manage the remaining hazards.

You must decide whether enough has been done to reduce the hazards by evaluating the adequacy of existing fire safety measures.

Can your extract system be upgraded to meet the specification of DW172? (ref. 2)

❑ Yes (L)

❑ No (H).

Do you have an emergency plan to protect the lives of staff and others within the building?

❑ Yes (L)

❑ No (H).

Stage 4: Keep records

It is recommended that you keep, in a safe place, records of system layout, risk assessments, inspection and cleaning reports. Without these, it will be impossible to assess the necessary frequency and extent of cleaning, particularly if new equipment or processes are introduced.

In addition, you have a legal responsibility to maintain staff training records. Should there be a fire or an accident, all these records may provide the only defence against criminal prosecution.

Records may also be helpful to demonstrate to an insurance company that the measures required in their insurance policy have been complied with; without them, and depending on the circumstances of a loss, you may lose your right to indemnity or payment for a claim.

Do you keep training and maintenance records?

❑ Yes (L)

❑ No (H).

Stage 5: Review and revise the assessment

It is a requirement to review and revise the fire risk assessment regularly and especially when changes are introduced to the kitchen.

Have you checked your insurance policy for specific conditions relevant to cooking?

❑ Yes

❑ No.

Do you comply with these conditions?

❑ Yes

❑ No.

6 Appendix: The risk assessment questions

The questions in the earlier sections are grouped together here in a table which can be referred to each time it is necessary to repeat the fire risk assessment. Remember that the aim is to try to increase the number of (L) scores that apply to your premises. Further advice, guidance or clarification may be available from the community/fire safety department of your local fire authority and from your insurer.

Subject/Question	Any action?	Completed
Cooking style and equipment Which of these cooking styles are to be found in your kitchen? ❑ Boiling with no risks of oil or grease vapour (L) ❑ Conventional frying or processes emitting steady vapour flow (N) ❑ Open flame grilling, flame cooking and sudden emissions of hot vapour (H). **Capable persons** Is a capable person on site at all times? ❑ Yes (L) ❑ Sometimes (N) ❑ No (H). **Staff knowledge and training** How many of your staff understand the systems and processes they are working with? ❑ All staff (L) ❑ Supervisor (N) ❑ No staff (H). **Inspections** How frequently are regular visual checks of the whole extract ventilation system made by a competent person? ❑ Monthly (L) ❑ Six-monthly (N) ❑ Annually or never (H). **Grease filters** Are grease filters in place? ❑ Yes (L) ❑ No (H). Do the filters comply with a recognised performance standard such as LPS 1263 (ref. 3)? ❑ Yes (L) ❑ No/Not known (N).		

(L) Low (N) Normal (H) High

Subject/Question	Any action?	Completed

The table below indicates the relative safety scores assuming regular cleaning and maintenance is undertaken.

Type	Risk
Mesh	High (H)
Baffle	Normal (N)
Cartridge	Normal (N)
Water wash	Low (L)
Cold water mist	Low (L)

If you want continuous running of the system, do you have two sets of grease filters to enable a clean filter to be fitted when the dirty one is removed for cleaning?

- ❑ Yes (L)
- ❑ No (H).

Duct accessibility

Can ducts be easily and safely reached?

- ❑ All (L)
- ❑ Some (N)
- ❑ None (H).

Are there other services beneath the ductwork that would hinder easy access for cleaning?

- ❑ None (L)
- ❑ Some (N)
- ❑ Yes (H).

Duct access doors

Are there enough access doors throughout the length of all ducts to reach all parts of the interior of the duct?

- ❑ Yes (L)
- ❑ No (H).

Are they quick release fixing?

- ❑ Yes (L)
- ❑ No (N).

Are they leaking grease?

- ❑ No (L)
- ❑ Yes (H).

Duct cleanliness

How is cleanliness/dirtiness established or measured and compared with published good practice benchmarks? (ref. 4)

- ❑ Physical measurement (L)
- ❑ Internal visual inspection (N)
- ❑ External visual inspection (H).

(L) Low (N) Normal (H) High

Subject/Question	Any action?	Completed
Route of the ducts Do you have vertical extract ducts more than 4m high? ❑ No (L) ❑ Yes (N). Are bends in ductwork accessible? ❑ Yes (L) ❑ No (H). Where there is ductwork installed outside the building is it included in the cleaning regime? ❑ No (H) ❑ Yes (N). Is there non-combustible easily cleanable protection to the roof covering at the duct termination? ❑ Yes (L) ❑ No (H). For larger buildings or those under multiple occupancy, do you have drawings depicting the extract ventilation? ❑ Yes (L) ❑ No (N). Are the drawings available if needed by the local fire service? ❑ Yes (L) ❑ No (N). **Factors affecting frequency of system cleaning** The level of use of the cooking equipment: - Heavy use (12-16 hours per day): three-monthly cleaning suggested; - Moderate use (6-12 hours per day): six-monthly cleaning suggested; - Light use (2-6 hours per day): 12-monthly cleaning suggested (ref. 4) **Frequency of cleaning** Subject to the level of use of the cooking equipment as indicated immediately above: • How frequently do you clean the whole system? • How frequently do you clean parts of the system? • How is complete cleanliness verified?		
(L) Low (N) Normal (H) High		

Subject/Question	Any action?	Completed
Ventilation system cleaning regime		
Are there enough access doors to enable the entire length of the internal and external surfaces of the ductwork including fans to be inspected and cleaned? ❑ Yes (L) ❑ No (H).		
Does your premises have a kitchen extract system cleaning schedule? ❑ Yes (L) ❑ No (H).		
Are your staff trained to clean grease and oil from the hoods, filters and grease trays on a regular schedule? ❑ Yes (L) ❑ No (H).		
Do you employ a competent specialist contractor to clean the extract ventilation system? ❑ Yes (L) ❑ No (H).		
Is a report produced after cleaning has been carried out? ❑ Yes (L) ❑ No (H).		
Have you inspected the cleanliness of the ducts via the filter housings and access doors to check on the effectiveness of a contractor's clean? ❑ Yes (L) ❑ Obtained photographic evidence (N) ❑ No (H).		
Fire suppression system		
Is fire suppression fitted to the extract ventilation? ❑ Yes (L) ❑ No (H).		
What kind of fire suppression system is installed? ❑ Water mist (L) ❑ Wet chemical (L) ❑ Dry chemical agent system (N).		
Is the liquid chemical agent system approved under a recognised performance standard? (ref. 1) ❑ Yes (L) ❑ No (H).		
(L) Low (N) Normal (H) High		

Subject/Question	Any action?	Completed
Do you have portable fire extinguisher(s) suitable for use on cooking oil fires? (ref. 6) ❑ Yes (L) ❑ No (H). Do you have a service and maintenance contract for the fire suppression system and portable fire extinguishers? ❑ Yes (L) ❑ No (H). **General** Can your extract system be upgraded to meet the specification of DW172? (ref. 2) ❑ Yes (L) ❑ No (H). Do you have an emergency plan to protect the lives of staff and others within the building? ❑ Yes (L) ❑ No (H). Do you keep training and maintenance records? ❑ Yes (L) ❑ No (H). **Insurance** Have you checked your insurance policy for specific conditions relevant to cooking? ❑ Yes ❑ No. Do you comply with these conditions? ❑ Yes ❑ No.		

Assessment completed by: Name _____

Signature _____

Date _____

Suggested date for re-assessment _____

(L) Low (N) Normal (H) High

7 References

1 *Requirements and testing procedures for the LPCB certification and listing of fixed fire-extinguishing systems for catering equipment,* LPS 1223, Issue 1, Loss Prevention Certification Board, BRE Certification, 2005.

2 *Specification for the design, installation and operation of kitchen ventilation systems,* DW172, HVCA, 2005.

3 *Requirements for the LPCB approval and listing of the fire performance of kitchen extract systems,* LPS 1263, Loss Prevention Certification Board, BRE Certification, 2003.

4 *Guide to good practice, internal cleanliness of ventilation systems,* TR/19 HVCA, 2005.

5 *Health and safety in kitchens and food preparation areas*, HS(G)55, HMSO, 1991.

6 *Specification for portable fire extinguishers for use on cooking oil fires (class F),* BS 7937, British Standards Institution, 2000.

8 Further reading

Guidance and the standard specification for ventilation hygiene, BSRIA, 1997.

Ackland, P. *The kitchen exhaust cleaning and certification manual,* Phil Ackland Holdings Ltd (available from BSRIA).

Hospital main kitchens, Fire Practice Note 4, Department of Health, HMSO, 1994.

Dillon, M. & Griffith, C. *How to clean, a management guide,* MD Associates, 1999.

Fire Risk Management in the Workplace – A guide for employers (3rd edition), Fire Protection Association, 2006.

Fire safety in restaurants, European Guideline 9, CFPA Europe, 2005.

Fire Safety Risk Assessment (series), Department for Communities and Local Government, 2006.

Specification for installation of gas-fired catering appliances for use in all types of catering establishments, BS 6173: 2001, British Standards Institution.

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Recommendations

for fire risk assessment of catering extract ventilation

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