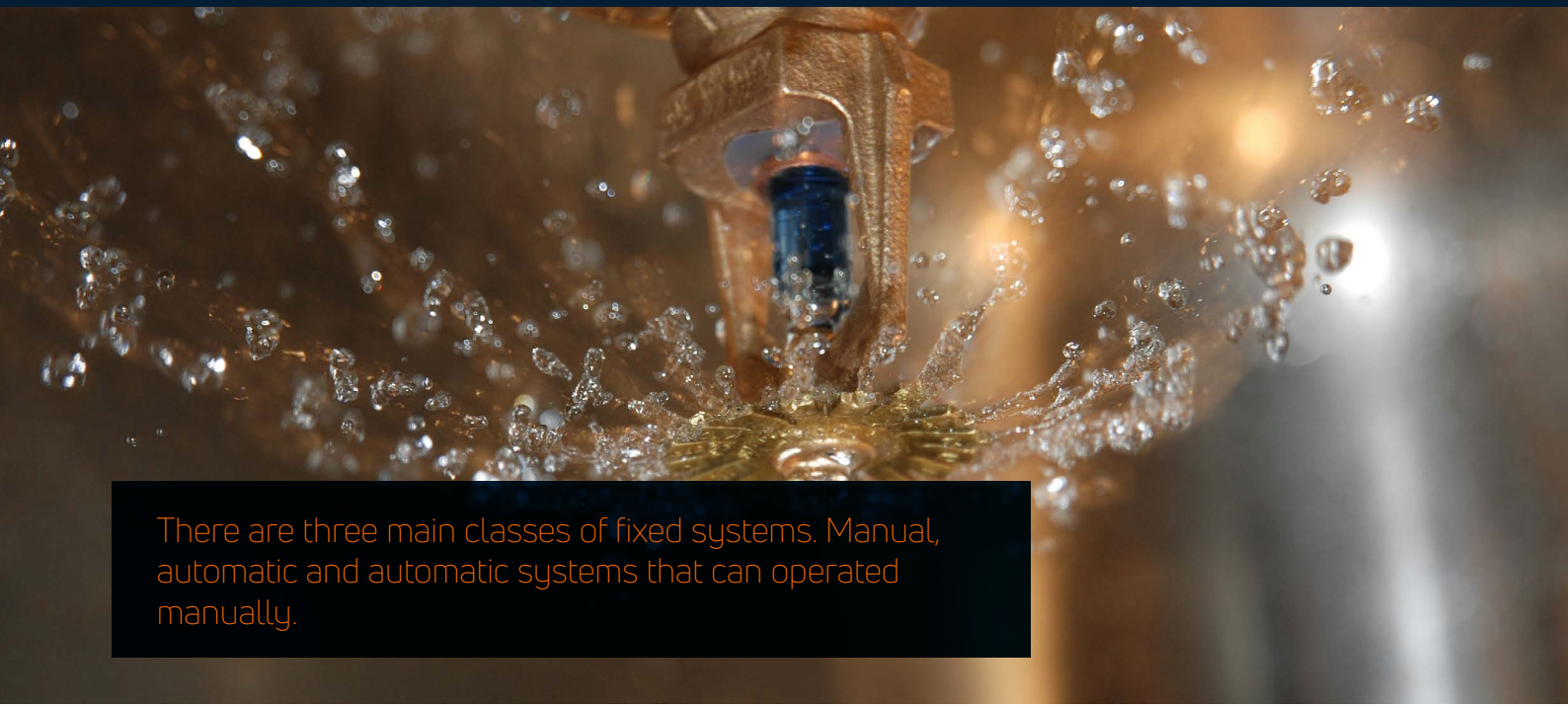
5.0 Fixed fire extinguishing systems

This guidance highlights the different types of fixed fire extinguishing systems available and their uses.

RISK ADVICE LINE

Having read this guidance should you have any additional questions on this topic or other risk related matters, as a valued Ecclesiastical customer you can contact us through our 'Risk Advice Line' on 0345 600 7531 (Monday to Friday 9am - 5pm, excluding bank holidays) and one of our in-house risk professionals will be able to assist. Alternatively you can email us at **risk.advice@ecclesiastical.com** and one of our experts will call you back within 24 hours.

For queries about your policy cover or claims please contact your insurance broker.



There are three main classes of fixed systems. Manual, automatic and automatic systems that can operated manually.

Portable fire extinguishers are valuable and effective when used appropriately. However, they are limited in the quantity of water or extinguishing agent that can be used and are only suitable in extinguishing small fires.

Fixed systems are both a method of getting an increased amount of extinguishing medium to the point where it is needed and ways of applying that medium where there are few people around to operate the manual fire extinguisher or it not safe for them to do so.

In a heritage environment the principal type of fixed systems can be listed as follows:

- Water hose reels
- Dry and Wet Risers
- Sprinklers
- Water mist
- Kitchen Fire Suppression
- Non-water based fire suppression systems.

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Water hose reels

In simple terms, hose reels are a drum on which a rubber hose that is permanently connected to the building's water supply is attached. They should be manufactured installed and maintained in accordance with BS EN 671-1-4: Fixed firefighting systems: Hose systems.

Reels can be "manual" or "automatic". Manual devices have an inlet valve that must be opened before the hose is unwound.

Automatic reels operate via a valve mechanism inside the spindle of the reel which activates as the hose is unwound. Both types have an adjustable valve on the nozzle used to control and turn off water flow. They have advantages and disadvantages when compared to portable fire extinguishers.

The advantages are they have a continuous water supply. A standard hose reel will spray around 20 litres per minute onto a fire compared to 4 -5 litres per minute for a 9 litre water type fire extinguisher.

The disadvantage is that their appearance may not suit heritage buildings, but they could be sited in a cupboard. Some Fire and Rescue Services do not support their use as they will require more than one trained person to use them, preferring people to evacuate instead. Where the hose is used inside, fire doors that the hose has to be passed through cannot be closed increasing the risk of fire spreading.

Dry and wet risers

These are hydrant mains rising inside a building to provide water to upper floors. They can be "wet risers" connected to the fire-water mains and kept full at mains pressure or they can be "dry risers" that are kept empty and are charged when required, by connection to a Fire and Rescue Service pump.

The riser main is fitted with standard hydrant outlet valves at each level, so that fire hoses can be connected.

Wet risers full and under fire mains pressure, provide an instant supply of water. Joints and valves may leak and the riser may need frost protection. The available water pressure is limited to that of the fire main to which it is connected.

Dry risers are "dead" until charged so leakage problems and frost are not a difficulty. They can be operated at a higher pressure than mains pressure as they are charged by a booster pump supplied by the Fire and Rescue Service. Hydrant valves need to be closed up and down the riser so that when it is charged there is no loss of pressure or water damage on unaffected floors due to unused hydrants being left open.

Checks should be made to ensure valves fit the Fire and Rescue Services equipment. The valves are normally fixed to an external wall. A suitable hardstanding area will be needed for the Fire and Rescue Service vehicle. This should be clearly marked and kept clear of obstructions such as parked cars.

These systems require regular testing, as a minimum annually, by a competent contractor,

Sprinklers

These are automatic extinguishing systems and Insurers should be consulted before installation. They have been used to provide protection in a number of heritage properties, where design and installation has been carried out in a sympathetic and non-intrusive manner.

There are various systems, but basically they comprise of ceiling level pipes to which temperature activated sprinkler heads are fitted at intervals. The system is supplied with water from the mains and/or a separate tank, which is released over the fire area in the form of a spray when the sprinkler heads are activated.

Advantages of a sprinkler systems are:

- It is an "ever ready" firefighting facility that protects the premises 24 hours a day and useful during unattended hours at premises.

- Activation of sprinkler heads by heat means that only those heads which are local to the fire are set off, so that those unaffected parts of the building are not water-damaged.
- Upon activation, the system can be designed to operate a fire alarm and the alarm signal can be placed inside or outside the building or both. Some systems are designed to alert the Fire and Rescue Service.

Installation of a system may be expensive and expertise is required in deciding on the most appropriate system after considering design calculations. Advice should be obtained from your Insurers and reputable consultants before installing. The Loss Prevention Council Certification Board operates a certification scheme for sprinkler companies. We recommend only a certified companies are used.

In non-domestic premises, systems should be designed and installed to LPC Rules for Sprinkler Installations 2009 incorporating BS EN 12845.

For domestic and residential properties, systems should be designed and installed to BS9251:2005 Sprinkler systems for residential and domestic occupancies, Code of practice.

Water mist systems

These systems have been successfully installed in heritage buildings. This system enables water to be applied as a mist at pressures higher than those found in conventional sprinkler systems. The system consists of components for fire detection, system actuation, water supply, delivery and atomisation.

A sprinkler system removes the heat element of the fire tetrahedron. The watermist system removes the heat and oxygen elements. Watermist nozzles that atomise water produce a mist of small droplets with sufficient momentum to penetrate a fire plume that control, suppress or extinguish a fire by:

- absorbing heat from the fire and surroundings.
- smothering the flames by evaporation to steam.
- blocking heat transfer to adjacent combustible materials.

A detailed assessment using competent consultants should be undertaken to help decide if these systems will benefit property protection.

Kitchen fire suppression systems

A fire in a commercial kitchen can cause major disruption. This may result in a total loss of a building and impact an organisations ability to continue to operate. Common causes of commercial kitchen fires include defective or damaged heating controls, overheating of cooking oils and fats, unattended devices, burners overheating and grease / dirt residue build-up.

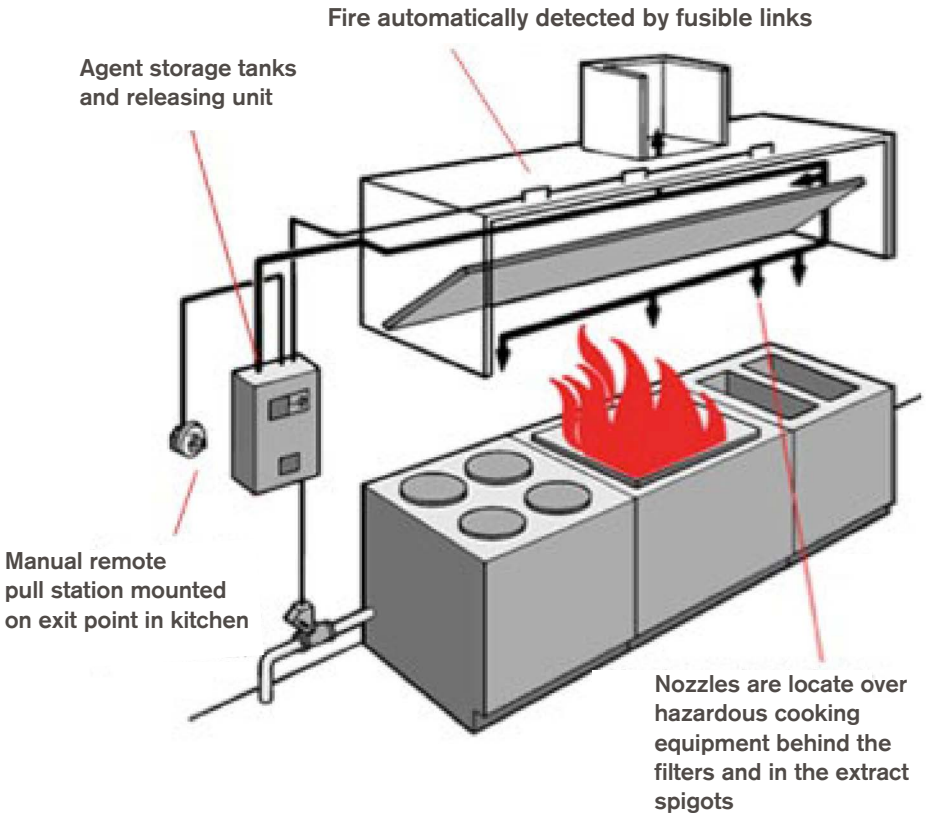
Kitchen hood suppression systems are designed to protect a wide variety of kitchen appliances, such as stoves or deep fat fryers. Nozzles for the fire suppression system are installed in the kitchen hood. When the system detects a fire, the nozzle built into the kitchen hood will release a water based extinguishing agent directly onto the source of the fire. Clean up time is minimal and the kitchen can shortly be back in operation with limited impact on the business.

If appliances are moved around under the hood, the suppression system must be reconfigured to provide optimum efficiency.

In order to offer the best level of protection the system should also be connected to the building fire alarm panel, electrical shutdown and/or interface and mechanical or electrical gas line shut-off applications. As well as automatic detection and actuation, kitchen fire suppression systems can also be manually activated.

Any system must meet requirements of LPS1223 "Requirements and testing procedures for the LPCB certification and listing of fixed fire extinguishing systems for catering equipment" or UL 300 (Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment).

Systems should only be installed by authorised distributors that are trained by the manufacturer who are also preferably BAFE Scheme SP206 "Design, Installation, Commissioning, Recharge and Maintenance of Kitchen Fire Protection Systems" accredited. After installation the system servicing should be in accordance with the manufacturer's guidelines by a BAFE Scheme SP206 accredited company.



Non – water based fire suppression systems

Gas based systems rely on maintaining an air tight compartment in order to attain the required concentrations of gas needed to extinguish a fire, which may be challenging in heritage buildings. The nature and construction of heritage buildings e.g. large space volumes, voids etc. may make such systems unsuitable. It may be appropriate to use these systems if specialist localised protection is required for areas of high risk e.g. protecting archive storage units, vaults or plant rooms.

Oxygen reduction systems function by decreasing the oxygen levels in a protected area and replacing with nitrogen, making combustion unsustainable. As gaseous systems they are unlikely to be suitable for use in heritage premises due to the nature of the premises. They may have some use to provide specialist protection for key items in archive areas.

Dry powder systems are not suited for heritage buildings. This is due to a very serious risk of significant damage to historic fabric, fixtures and artefacts caused by the composition of the powder used, particularly when damp or combined with water.

Foam systems spray a foam/water solution onto a fire which may cause damage to historic fabric, fixtures and artefacts and, therefore, are not an appropriate solution for heritage buildings..

Key messages

- Fixed fire extinguishing systems are likely to be a significant capital outlay. It may be possible to offset this by reduced premiums from Insurers and eventually pay for itself over the medium to long term period.
- Costs may offset property damage or interruption to an organisation.
- External advice should be taken from a specialist engineer with expertise in fire engineering.
- These systems give reassurance that should a fire occur the system will automatically extinguish the fire with minimal damage or impact to the business activities.

Important Note – For any interventions to your building you will require Listed Building Consent (if a listed building). Also, you should consider any advice given by Historic England, the Amenity Societies and other conservation bodies.

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