



Security in museums and galleries: fire prevention

Fire is perhaps the greatest threat to a collection: if a fire occurs and is not detected and contained the entire collection can be lost. Many collections have been destroyed by fire, often when housed in buildings constructed when far less was known about fire prevention and detection than is the case today. Although the incidence of fires in museum buildings has steadily reduced over recent years, mainly due to statutory building controls and the widespread use of modern detection systems, it should be noted that there are an increasing number of cases of arson in the UK.

In England and Wales, if you are an employer, owner, landlord or occupier of business or other non-domestic premises, under the Fire Safety Order, you are responsible for fire safety. There are certain things you must do by law under the Fire Safety Order, which is enforced by your local fire and rescue authority. These apply to keeping both people and assets safe from fire. As the 'responsible person' you must:

- carry out and review regularly a fire risk assessment of the premises
- tell staff and/or their representatives about the risks you've identified
- put in place, and maintain, adequate and appropriate fire safety measures to remove or reduce the risk to life
- plan for an emergency
- provide staff information, fire safety instruction and training

Fire safety law in Scotland and Northern Ireland is slightly different, but the responsibilities outlined above are broadly the same.

Basic principles of fire prevention

- all museums should have a written security policy which has been signed off by senior management, and sets out how the museum complies with the Fire Safety Order. ***Note that this guide is primarily concerned with the security of collections: as a museum you also have higher level responsibilities for the safety of people***

- the Fire Safety Order places an emphasis on risk assessment and reduction. The Museum Security Toolkit (<http://www.collectionslink.org.uk/security-and-collections/1593>) explains more about this way of working with reference to museum collections, and is supported by the Security Audit Checklist (<http://www.collectionslink.org.uk/all-security-resources/1712-the-security-audit-checklist>) which provides you with a procedure for checking your collections security measures
- all museums should have an Emergency Plan which identifies measures to be taken to protect and salvage the collection in the event of a fire. This is a requirement of the Museum Accreditation Scheme
- specialist advice should be sought prior to choosing and installing specialist fire detection and prevention equipment

There is a classification system for commercial fire alarm systems. The classification categories are:

- “L” if systems are designed to protect life
- “P” if systems are designed to protect buildings
- “M” if systems are manual

Within these categories there are further subdivisions. The systems recommended for use in the museum sector are L1/P1.

A short guide to making your premises safe from fire is available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/14879/making-your-premises-safe-short-guide.pdf

Practical fire security measures

Maintenance and testing

You must carry out regular checks to make sure that:

- all fire alarm systems are working
- the emergency lighting is working
- you record any faults in systems and equipment
- all escape routes are clear and the floor is in a good state
- all fire escapes can be opened easily
- automatic fire doors close correctly
- fire exit signs are in the right place

Power sources

Attention to the installation, maintenance and storage of appliances and power sources plays an important part in the prevention of fire.

- all electrical wiring and equipment must be installed in accordance with the appropriate British Standard and statutory regulations
- gas, oil and mechanical equipment must be installed in accordance with the appropriate British Standard and statutory regulations
- spare gas cylinders must be stored upright and outside whenever possible. Never store them in basements, under stairs or in cupboards containing electric meters or equipment
- a register of all equipment needs to be established to include maintenance records and inspection certificates
- a detailed plan of all installations needs to be kept in a convenient place for passing to the emergency services on their arrival at an incident

Good housekeeping

Good housekeeping routines make a significant contribution to fire prevention. Staff should be able to recognise situations which may place collections at risk from fire. Good housekeeping routines should include:

- regular cleaning and removal of waste
- inspection to check that appliances are not being used incorrectly
- inspection to check that and that electrical socket are not overloaded, or left plugged in overnight unnecessarily

Housekeeping routines should be logged, and there should be a mechanism for escalating concerns if they arise.

Smoking

Smoking is a common cause of fire and is not allowed inside any enclosed workspace, or public building in the UK. All businesses must:

- make sure people don't smoke in enclosed work premises or shared vehicles
- display 'no smoking' signs in all workplaces and vehicles

Preventing fire as a result of smoking in museums should be strictly controlled, by:

- designated and signed external smoking areas
- safe and contained disposal of smoking materials by smokers in bins which will not burn or tip up easily
- emptying and disposing of smoking material so that it does not catch fire when added to other refuse

See <https://www.gov.uk/smoking-at-work-the-law> for more about the legal requirements surrounding smoking in the workplace.

Working with contractors

There are occasions when the risk to the collections from fire are increased due to changed working routines, for example when contractors are working on site. See Security in museums and galleries: working with contractors (<http://www.collectionslink.org.uk/all-security-resources/1713-security-in-museums-and-galleries-working-with-contractors>).

Reducing Risk by Design

Buildings should be designed or adapted to minimise the risk of fire and to prevent its spread. The Building Control Officer and the local Fire Officer should be invited to inspect premises regularly, independently of their statutory responsibilities. The Building Control Officer will advise on the selection of materials to be used in displays and stores. These should usually be fire retardant, but care will also need to be taken to assess the chemical stability of materials from a conservation point of view. It should be noted that the effectiveness of fire retardants wears off in time.

A formal application for building regulation approval is normally required for any structural work. Modification of historic buildings may also require listed building or other consents.

When planning new buildings to house collections, or adapting existing buildings:

- Areas of high fire risk such as workshops, laboratories, kitchens, boilers, plant room or chemical stores should be located as far as possible away from collections areas, and if possible should be located externally to the buildings housing the collections
- If collections and areas of high risk are located in the same building, high risk areas should be insulated to a high standard to prevent the spread of fire to collections areas. Insulation should provide protection to the collections from fire for not less than half an hour, but preferably one hour

Fire Safety in Construction at <http://www.hse.gov.uk/pubns/books/hsg168.htm> explains how everyone involved in construction projects can comply with their legal duties relating to fire risks. It is

aimed at all those with a role for developing and managing construction sites, including clients and designers, and is relevant to all construction projects, including small refurbishment of sites.

Fire fighting equipment

The types of equipment you need depend on your business premises. You will need to:

- have fire fighting equipment properly installed, tested and maintained
- train your staff in the use of equipment

Sprinkler systems

The proven benefits and increased reliability of these systems have led to an increase in their use, especially as the cost of night guards has escalated. However, reservations still exist in some UK museums where there is concern at the potentially destructive consequences of accidental discharge. Such concerns can be addressed by installing a 'dry' or 'pre-action' system in which the pipework is normally charged with air and will only fill with water in response either to a sprinkler head opening or to the activation of an automatic fire detector. While this reduces the threat of accidental discharge, it has to be balanced against the fact that the system will not activate as quickly in the event of a real fire.

As far as the risk to books and manuscripts from water discharge is concerned, conservation attitudes and techniques have changed in recent years and water damage, although still a concern, is generally regarded as less potentially damaging than fire damage. Water-damaged books and manuscripts can now be removed and stored in blast freezers or cold stores where they can be preserved without deterioration until conservators are able to repair them.

It should be noted with regard to all sprinkler systems – whether 'wet' or 'dry' – that each head operates entirely independently of every other head and the idea that all heads throughout a large area will operate simultaneously is fallacious.

Gaseous Systems

These are normally used for protection of specific enclosed areas of a building in which water would be an unsuitable medium. Commonly used in computer suites and electrical plant rooms, gaseous systems can also be used to protect very rare or fragile cultural artefacts including books and manuscripts. They work by reducing the oxygen level within an enclosed area and thus extinguishing the fire.

The main gas used in recent years has been Halon; however, this is now being phased out because of its destructive impact on the ozone layer. Carbon dioxide (CO₂) is an alternative, but its toxic nature may give rise to safety concerns. Several safer gases have been developed in recent years. These include halocarbon agents such as FM200, inert gases such as Inergen, and Argonite.

Both halocarbons and inert gases have advantages and disadvantages. Halocarbon agents are 'greenhouse gases' and possibly subject to future environmental control, while inert gases require a much higher concentration to be effective and greater storage space for the gas cylinders.

Hand-held Fire Extinguishers

Your local Fire Prevention Officer will advise on the appropriate types of hand-held fire extinguishers for areas where different types of fire are likely to occur.