

Freezers and Fridges

Deterioration of Research Materials

This document does not intend to cover any liability or health and safety issues within laboratories or research facilities. Its purpose is only to give general guidance on the management of cold storage appliances with a fire prevention perspective. Extra safety precautions can be needed when dealing with highly hazardous materials.

Understanding the Risk

Freezers and fridges are commonly used in laboratories and research facilities to store research materials and work in progress, which could have a very high exposure regarding future business interruption. It is therefore essential appropriate equipment is selected to meet the demanding temperature requirements and provided with adequate protection to increase resilience and risk of failure.

Use Spark Free Fridges / Freezers

Freezers and fridges used for storing flammable liquids / materials are a potential ignition source risk so appropriate equipment must be selected to meet the requirements of the ATEX (Explosive atmosphere European Regulations) Equipment Directive.

Risk Management Best Practice

As best practice, it is recommended to split samples between more than one freezer.

Adequate maintenance of the freezer will ensure it continues to function e.g. cleaning of filters.

Temperature Alarm

Continuous monitoring of critical high / low temperature parameters should be provided and tested in accordance with manufacturer's recommendations.

Temperature alarm monitoring should signal to a 24/7/365 manned alarm receiving centre on-site or off-site. If off-site the transmission system must be secured (landline with daily test and GSM backup).

Electrical Inspection

The apparatus must be part of a regular electrical control system such as:

- 5 yearly fixed wired inspection by a NICEIC approved company
- 2 yearly infrared thermography
- Yearly Portable Appliance Testing

Trailing electrical cords should be avoided.

Freezers should be hard wired directly into the power supply via a switched fused spur. The freezer unit can still be switched off but it removes the possibility of the freezer being accidentally unplugged.

Power Supply

To ensure proper storage of critical material, a redundant and/or emergency power supply with a dual feed from two different sources should be provided to avoid loss of power and damage.

This can be accomplished with an Uninterruptible Power Supply (UPS) and emergency diesel generator.

Fire Detection

Provide automatic fire detection in the freezers/fridges if technically feasible to ensure early detection and also in the room containing the equipment.

Fire detection should be monitored from a 24/7/365 manned alarm receiving centre on-site or off-site. If off-site the transmission system must be secured (landline with daily test and GSM backup).



Fire Protection

Provide adequate fire protection where the apparatus is installed:

- Automatic fire extinguishing system:
 - Sprinklers can be installed with quick response type heads in accordance with BS EN 12845 LPC Rules
 - Other systems can be installed; if non-water based they should be installed according to the adequate applicable standard
- Standpipe and hose system when located two or more storeys from the ground level
- Fire extinguishers installed and maintained

Housekeeping

Chemicals, flammables and combustible liquids and gases must be stored in COSHH approved cabinets kept closed at all times. The quantity in each laboratory must be limited to one day's use. The main storage must be in a fire separated, dedicated room equipped with ATEX compliant lighting devices, air extraction, automatic fire detection and automatic extinguishing system.

Open flame and spark producing equipment must only be used in areas designated for this purpose.

Storage is forbidden within 2.5 m of the fridges / freezers.

Strict no smoking policy controls in the premises and in the vicinity of the doors.

Fire doors to be kept closed and clear at all times.

Ensure ductwork and cable tray holes are sealed with non-combustible materials ensuring the integrity of the fire wall.

Extracting hoods to be kept closed when there is work in progress.

Secure waste disposal in COSHH approved cabinets kept closed at all times. Remove waste disposal on a daily basis. If this is not feasible, install an outdoor waste container with containment facility, which will be located at least 10m away from any buildings to collect hazardous waste.

On a yearly basis complete a full inspection of the piping system for combustible gases and flammable gases (non-destructive tests, tightness test, cracks search, etc.).

Security

Provide access control to the laboratory to limit entrance to authorised personnel only.

Permit to Work

Any contractors who have access to labs which contain freezers must receive induction training to ensure that they understand that such equipment cannot be unplugged.

Standards

The references are the latest enforceable version of:

The Dangerous Substances and Explosive Atmospheres Regulations 2002

Electricity at Work Regulations 1989

RISCAuthority doc RC5 – Fire Protection of Laboratories

NFPA 45: Standard on Fire Protection for Laboratories

Using Chemicals

BS EN 12845 LPC Rules

For further information, contact your local AIG Risk Engineer



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