

The Glasgow School of Art

GSA Guide to Safe Use and Storage of Flammable and Combustible Liquids

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Policy Control

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Author	Ms Amy Moore, Health and Safety Adviser
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Benchmarking	University of Bristol; Chemical Storage Guidance Edinburgh College of Art; ECA Guide to the storage of flammable materials. University of Edinburgh; CS CoP007 – Storage of Chemicals Health and Safety Executive (HSE) ; Working with Solvents (INDG273) HSE ; Storage of Flammable Liquids in Containers (HSG51) HSE ; Safe use and handling of flammable liquids (HSG140)

GSA Guide to Safe Use and Storage of Flammable and Combustible Liquids

Introduction

Where flammable liquids are present in the workplace, there is a specific requirement under The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) to identify the potential risks any activities may pose to your employees and others whose health and safety may be affected. The risk assessment required under DSEAR may be carried out as part of the risk assessment requirements of the Management Regulations and general fire safety legislation, which follows the same approach as that used in health and safety legislation. The outcome of this risk assessment will determine the measures to be taken to eliminate or reduce these risks so far as reasonably practicable.

Staff and students must comply with the Health and Safety measures that apply to the use and storage of flammable liquids within their work area and report any defects in equipment, personal protective equipment and flammable storage facilities including the reporting of any accidents, incidents or near misses.

This document provides guidance on the safe use and storage of flammable and combustible liquids to ensure both the Health and Safety of staff, students and other individuals who may be affected.

1. Flammable and Combustible Liquids

In this guidance, 'flammable liquid' means a liquid with a flashpoint of 60 °C or below. This reflects the EU Classification, Labelling and Packaging of Substances and Mixtures Regulation (the CLP Regulation), which sets the criterion for substances and mixtures to be classified as flammable to be those with a flashpoint of up to 60 °C.

This guidance applies to flammable liquids stored above their flashpoint. Primarily this will be flammable liquids categorised under CLP as:

- Category 1: flashpoint <23 °C and initial boiling point ≤35 °C
- Category 2: flashpoint <23 °C and initial boiling point >35 °C

However, it also potentially includes:

- Category 3 flammable liquids (under CLP) flashpoint ≥23 °C and ≤60 °C
- Combustible liquids with a flashpoint above 60 °C

2. Working with Flammable Liquids

Activities within GSA may require the availability of flammable substances. Applying some general principles can help ensure hazardous chemicals are stored in a safe manner. It is good practice to limit the amounts purchased to that required for foreseeable work and to minimise the quantities stored.

It is advisable to limit bottles/containers to the minimum required, however these should be limited to 500ml or less and be kept away from ignition sources. Exposure to heat or direct sunlight may lead to the deterioration of containers as well as degradation of the contents, therefore containers should be stored away from direct sunlight or heat sources.

3. Storage containers

Containers should be able to resist wear and tear in normal use and corrosion by the specific liquid being used. They should be strong enough to withstand being dropped. Plastic containers should be compatible with the fluid that they are intended to contain. They should incorporate anti-static features so that any metal components in the transfer system, such as flame arresters or funnels, cannot build up electrostatic charges. The use of containers approved by a recognized testing and approval organisation is recommended.

Open-topped cans and buckets should not be used for handling or storing flammable liquids as they increase the risk of spillage and the release of vapours. Bottles/containers should be provided with secure closures that can withstand the expected handling conditions without leaking and should always be opened so that they can easily be closed again.

4. Location of Storage

Where outdoor storage of containers is not reasonably practicable, they may be kept indoors, provided there is adequate ventilation to prevent the dangerous accumulation of flammable vapours that may arise as a result of foreseeable leaks from the containers.

Any cabinets and/or bins should be located in designated well-ventilated areas and should be positioned away from doors and fire evacuation routes to ensure people can evacuate safely. The presence of flammable storage should be indicated on room hazard plans and recorded in the building fire risk assessment.

Flammable liquids should be stored separately from other dangerous substances that may increase the risk of fire or compromise the integrity of the container or cabinet/bin. They should also be kept away from any heat or ignition sources such as:

- naked flames, including welding and cutting equipment
- smoking and smoking equipment
- electrical lighting, power circuits and equipment
- personal electrical equipment including mobile phones, computers and tablets
- mechanically powered plant
- processes that involve the generation of sparks
- hot surfaces

5. Flammable Cabinets

When not in use, flammable liquids should be placed in an appropriate flammable storage cabinet. Individual containers must be clearly marked to indicate their contents and the degree of flammability. No more than 50 litres of flammable liquids may be kept in a room within appropriate flammable storage cabinets. These cabinets must be of metal design and provide 30 minutes fire resistance. In order to contain spills and breakages, the cabinets should be equipped with corrosion resistant trays or lipped shelves.

The flammable liquids should be stored separately from other dangerous substances that may enhance the risk of fire or compromise the integrity of the container or cabinet/bin; for example energetic substances, oxidizers and corrosive materials.

Stocks of combustible materials, such as packaging, should not be kept in the flammable storage cabinet.

Potentially, this could be the first material ignited and a subsequent fire would then be likely to compromise the safe storage of the flammable liquids containers.

Flammable storage cabinets should include measures to prevent or mitigate spills, leaks or breakages such as:

- Using secondary containment to contain spills or leaks. Containment should account for 110% of the volume of the largest container e.g. if the largest container holds 1L then containment should hold at least 1.1L.
- Consider appropriate storage positions - avoid storing glass bottles on the floor where they may be damaged or knocked over. Locate large containers on lower shelves and avoid stacking containers on top of each other.
- Where there is a need to store decanted solutions, ensure the containers are appropriate for the chemicals they are to contain and are well sealed and labelled. Do not overfill containers and allow enough free head space to account for any expansion of the contents and prevent over pressurising of the container.
- Use appropriate carriers or trolleys to transfer items between storage and point of use.
- The safe management of hazardous chemicals includes providing appropriate information to users about the hazards posed by these substances. Therefore container labels should be intact and clearly indicate the nature of the chemical hazard. Safety data sheets contain relevant information regarding safe use, precautionary measures to take and suitable storage recommendations; these should be kept up to date and made readily available to users.

Information about the hazards posed by chemical materials is available from a number of sources including:

- **Safety Data Sheets:** suppliers are required by law to provide hazard information for their products which have been classified as hazardous to supply. Safety data sheets must include information about the properties of a substance, the hazards posed, handling, storage, disposal and transport instructions and emergency information including exposure control measures
- **Container labels:** Individual containers must be clearly marked to indicate their contents and the degree of flammability. Flammable liquids arriving on site will be marked in accordance with The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG) and the CLP Regulation. Container labels should contain the supplier contact information, the approved or trade name of the substance, the nominal quantity supplied and all relevant hazard statements, pictograms, signal words and precautionary statements
- **Trade and supplier websites**

This labelling is likely to be sufficient to help you determine the storage arrangements required for the flammable liquid containers.

Examples of flammable liquid packaging labels:



Diagram source: HSE publication; HSG51

6. Small-scale dispensing and decanting

Dispensing and decanting should be carried out in a way which reduces spills and dangerous releases of flammable vapours and should normally be carried out away from the area where the liquid is stored, and preferably in the open air or in a separate, well-ventilated room, so that any spillage and possible fire cannot involve the stored materials. When pouring manually from or into small containers, use a funnel to minimise spillage.

Small safety containers are available which incorporate the following features:

- metal or heavy-duty plastic construction
- pouring and/or filling apertures sealed with self-closing spring-loaded caps
- pouring and/or filling apertures fitted with flame arresters
- hoses or other aids when dispensing into small openings
- carrying handles for containers with a capacity greater than approximately 2.5 litres

Examples:



Diagram source: HSE publication; HSG140

7. Storing Waste Flammable Liquid

Waste should be stored according to the same principles as all chemical storage, however waste containers must be clearly labelled as waste and the relevant hazard information displayed.

The materials of construction should be compatible with the chemical and physical properties of the flammable liquid to ensure that no interaction occurs which might cause leakage. All the container openings should be equipped with a secure and well-fitting cap or lid to resist the escape of flammable liquid or vapours, including if the container falls or rolls over.

8. Storing Other Flammable Waste

Rags soaked in flammable liquids pose a significant fire risk. To minimise the risk of fire, all flammable materials should be stored in a separate, metal container used solely for the purpose of storing oily rags and the lid should be kept secure at all times.

The flammable rags bins and liquid flammable waste bins are not for normal domestic refuse.

Examples of flammable rag bins:



9. Signage

Chemical storage areas should display signs to indicate the nature of the hazard present. Signs should conform to the requirements of the Health and Safety (Signs & Signals) Regulations 1996 or the relevant Classification, Labelling and Packaging Regulation pictogram. To avoid confusion, where several different chemical hazards are present a general warning sign or signage indicating the primary chemical hazard may be used.

For more information on safety signage you should refer to: [Safety Signs and Signals](#).

10. Spillages

Locations where flammable liquids are stored should have adequate means to prevent the uncontrolled spread of any spillages or leaks. Typically, this is achieved by ensuring the base or floor of the storage area is impervious and enclosing this with an impervious sill, low bund wall or drainage channel.

It is important to ensure that anyone dealing with a chemical spill knows how to respond appropriately therefore local spill procedures and arrangements should be agreed and communicated to staff and students in the area. Prompt action to deal with leaks from individual containers can prevent escalation to a larger incident, including fire. The supplier's SDSs should detail any specific action to be taken for dealing with spillages.

Spill kits should be appropriate to the risk and quantities of substances stored and include:

- Absorbent material for dealing with liquids (e.g. absorbent pads, pillows, socks and absorbent granules)
- Chemical neutralisers where necessary
- Dust pan and brush
- Plastic bags for containing contaminated materials
- Suitable PPE (e.g. nitrile/rubber gloves, eye protection, disposable apron or coveralls)
- Drain protection to prevent spills entering the drainage system.
- Other specialist equipment

Incidents involving spills should be reported in line with the GSA Procedure for Reporting Accidents, Incidents and Near Miss Events.

11. Further Reading

For more information on flammable liquids you should refer to:

- [HSE ; Storage of Flammable Liquids in Containers \(HSG51\)](#)
- [HSE ; Safe use and handling of flammable liquids \(HSG140\)](#)
- [HSE ; Working with substances hazardous to health: A brief guide to COSHH \(INDG136\)](#)