



Health & Safety Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) Policy

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<i>Authorised signature</i>	David Conner, Health & Safety Manager

¹ or earlier if change in legislation or on risk assessment

Amendment Control

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1.0	Jan 2023	

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Policy Summary

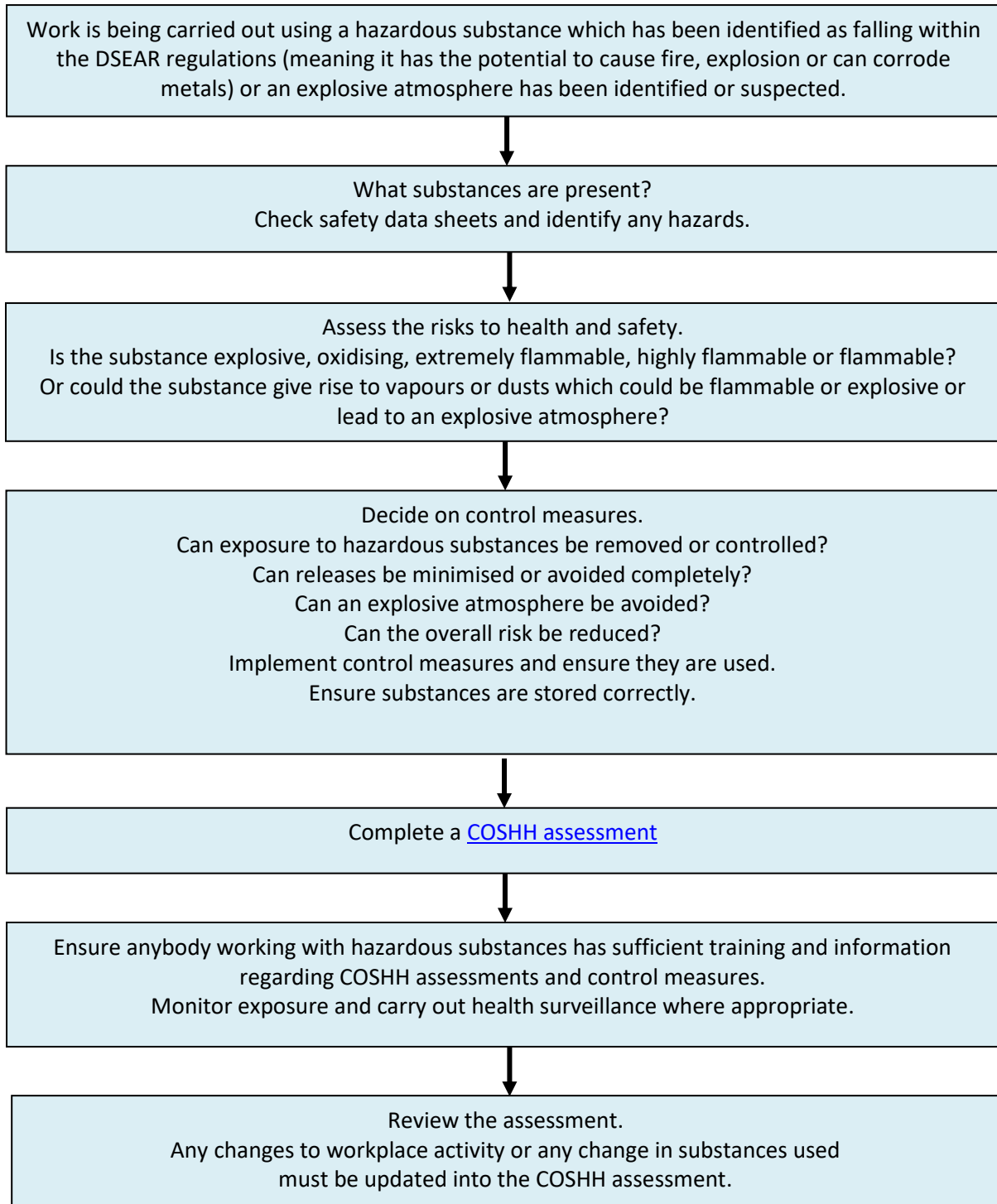
The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) is a set of regulations that are designed to protect staff, students and other individuals from hazardous substances in the workplace, which can cause fire, explosions or the corrosion of metal.

Schools and Services must be able to identify any substances which fall within the DSEAR regulations, assess any risks to health and wellbeing of staff, students and other individuals working in their areas and ensure control measures are in place in order to eliminate or reduce risk.

This policy goes hand in hand with the university's [Control of Substances Hazardous to Health \(COSHH\) Policy](#). Whereas COSHH covers all hazardous substances used in the workplace, DSEAR only covers substances which can cause harm through fire, explosion or are corrosive to metals.

This policy is for all Schools and Services to ensure compliance with the DSEAR regulations and to help control and manage any risks.

DSEAR Flowchart



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1. Introduction

The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) is a set of regulations in place to protect the health of staff, students and other individuals who may be affected by the university's work involving substances which can cause fire, explosions or the corrosion of metals.

Hazardous substances which fall within DSEAR can be:

- Solids
- Liquids
- Gases
- Fumes
- Vapours
- Mists
- Dusts

The Dangerous Substances and Explosive Atmospheres Regulations require Schools/Services to:










- Assess the risks to health and safety.
- Decide what precautions (control measures) are required to prevent ill health.
- Prevent or control exposure.
- Make sure that the control measures are used and maintained.
- Ensure emergency and firefighting arrangements are in place to deal with accidents and emergencies.
- Ensure that all employees are properly informed, trained and supervised where appropriate.
- Monitor exposure and carry out health surveillance where appropriate.

Schools/Services must control exposure to materials that can cause fire, explosions or are corrosive to metals. Schools/Services are required to identify substances which fall under these regulations and to ensure control measures, correct storage, handling regimes and safe disposal routes are all in place.

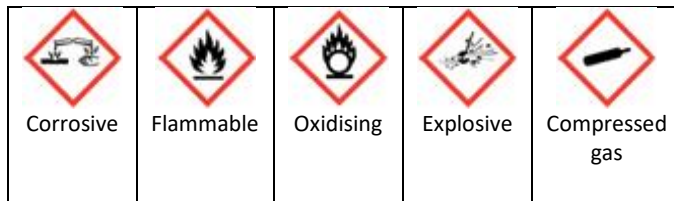
2. Definition of a DSEAR hazardous substance

A hazardous substance is one with the potential to cause harm to health. A hazardous substance which falls within DSEAR regulations causes harm to health through being flammable, explosive and/or corrosive to metals. DSEAR hazardous substances can be solids, liquids and gases but also includes certain dusts, fumes, mists and vapours.

Hazardous substances will normally be classified and labelled as falling into one of the following groups:

								
Health Hazard	Toxic	Corrosive	Harmful/Irritant	Flammable	Oxidising	Explosive	Compressed gas	Harmful for the environment

DSEAR substances can be classified as any of the above hazards but would most likely fall within one of these groups:



Note – Certain substances such as dusts, e.g. wood dust or flour dust, would not have a hazardous label but will still fall under the DSEAR regulations due to them having an explosion risk.

A full definition of the hazardous pictograms can be found in **Appendix 1**.

3. DSEAR substances

Substances which fall within the DSEAR regulations include laboratory-based chemicals such as flammable solvents and certain acids but can also include other substances.

Dangerous substances that could, if not properly controlled, cause harm to people as a result of a fire or explosion can be found in nearly all workplaces and can include materials such as:

- Solvents
- Paints
- Varnishes
- Adhesives
- Flammable gases
- Dusts (from machining and sanding operations)
- Dusts (from foodstuffs)

Nominated, trained individuals from the Schools/Services are required to:

- a) Check whether any substances they are using have been classified under the CLP (Classification, Labelling and Packaging) Regulations and REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) as being explosive, oxidising, extremely flammable, highly flammable or flammable.
- b) Carry out suitable and sufficient risk assessments for the substances in their workplace.
- c) Ensure measures have been taken to:
 - avoid or minimise releases
 - prevent the formation of an explosive atmosphere
 - avoid adverse conditions (e.g. exceeding the limits of temperature or other control settings)
 - keep incompatible substances apart
- d) Ensure that the necessary controls are implemented and used. In particular:
 - ensure procedures are in place to remove (or control) all sources of ignition
 - ensure that all plant and equipment is used in such a manner to control or minimise the spread of fire or explosion
 - if a permit to work scheme is required in the work area that it is strictly enforced

- e) Appropriate safe systems of work or safe operating procedures have been developed and communicated to the staff and students in their area.
- f) Review the assessment at regular intervals or if there have been any material changes e.g. new chemicals, processes, equipment and/or locations.
- g) Input all chemicals onto the University Hazardous Substances Database and update as required.

DSEAR Regulations - Schools/Services also have a duty to:

- a) Ensure any control measures are being used and are working properly (including plant, equipment and engineering controls are maintained). In particular:
 - plant has been supplied that is explosion resistant where required
 - explosion suppression or pressure relief has been provided on equipment where required
 - the workplace/workshops/laboratories are designed, constructed and maintained so as to provide adequate fire resistance and/or explosion relief where required.
- b) The workplace and storage areas are secured to prevent unauthorised access.
- c) Suitable Personal Protective Equipment (PPE) has been provided, and users have been trained how to use, store, maintain, clean and dispose of it correctly.
- d) Ensuring the safe storage of substances whether in laboratories, the workplace or chemical stores as per the regulations.
- e) Provide information, instruction and training for any staff, students or other individuals working with DSEAR hazardous substances.
- f) Provide monitoring and health surveillance in appropriate cases.
- g) Plan for emergencies such as accidental leaks or spillages and ensure arrangements are in place before work begins.

Note - Edinburgh Napier University employed a company to create DSEAR risk assessments for all of the external storage units at both Merchiston and Sighthill Campuses. This is managed by the University Health and Safety Team. This included gas cylinder storage areas, chemical and solvent storage areas as well as any waste chemical storage. They also inspected a number of laboratory/workshop areas within the campus buildings creating DSEAR assessments for the more high-risk areas.

4. COSHH and DSEAR – what is the difference

Both COSHH (Control of Substances Hazardous to Health) and DSEAR (Dangerous Substances and Explosive Atmospheres Regulations) are very similar in that the university must fully assess hazards and control the risks that come from storing, handling, transporting and disposing of hazardous or dangerous substances.

Whilst the COSHH regulations covers all hazardous substances including ones which may be classified as toxic or irritant, the DSEAR regulations deal with dangerous substances that can affect people's health through fire and explosion. It also covers substances which are corrosive to metal.

DSEAR requires Schools/Services to assess the risks of fires and explosions that may be caused by dangerous substances in the workplace. These risks must then be eliminated or reduced as far as reasonably practicable.

Consideration must be taken when purchasing new chemicals or equipment which falls within the DSEAR regulations. Before proceeding or if you are unsure please contact the Health and Safety Office.

DSEAR applies whenever **all 3** of the scenarios below are present:

- There is work being carried out in the university (this can also include fieldwork away from the university).
- A hazardous substance is present in the workplace.
- The dangerous substance could be a risk to the safety of people as a result of fire, explosion or through corrosion to metal.

The following examples illustrate the type of activities covered by DSEAR:

- Storage of petrol.
- Storage and use of flammable solvents in laboratories.
- Storage and use of flammable gases such as acetylene.
- Handling and storage of flammable wastes such as fuel oils, waste solvents etc.
- Transporting flammable substances in containers around the workplace.
- Handling, storage and use of gases under pressure.
- Handling, storage and use of substances corrosive to metal.
- Storage, filling and handling of aerosols which have flammable propellants.
- Handling and storage of dusts in work areas including in kitchens and workshops.

5. Ignition sources

DSEAR substances can cause harm by fire and explosion as well as being corrosive to metals. Any substance which would cause fire and/or explosion requires an ignition source. Ignition causes a release of a flammable liquid or gas to become a fire or explosion. There are many possible sources of ignition and those that are most likely will depend on the release scenario.



In the above diagram the fuel is the hazardous substance such as petrol, solvent, paint thinners etc.

The ignition source can include:

- Flames
- Friction heating or sparks
- Impact sparks
- Sparks from electrical equipment

- Stray currents from electrical equipment
- Hot surfaces
- Cutting and welding flames
- Mechanical machinery
- Use of cigarettes/matches etc.
- Spontaneous heating
- Lightning strikes

6. Explosive atmospheres

An explosive atmosphere is a mixture of air and dangerous substances with the potential to catch fire or explode. Dangerous substances can burn or explode if an ignition source is present.

Substances can include:

- Flammable liquids and solvents such as alcohol, paints or thinners.
- Flammable gases such as Hydrogen or Propane.
- Pressurised gases such as Oxygen and Nitrogen.
- Dusts from flour.
- Dusts from woodworking.
- Substances like Hydrochloric acid which can burn through metal*

*When acid attacks metals, Hydrogen is often given off which is a flammable gas.

Any DSEAR assessment will be required to consider the following criteria:

- The hazardous properties of any DSEAR substances such as boiling point, flashpoint and flammability limits.
- Quantities of the substances being used.
- Work processes of the substances being used.
- The temperature and pressure at which the substances are being stored and used.
- Any control measures in place to prevent hazardous substances escaping to the workplace environment.
- Types of ventilation in place.

When the risk cannot be eliminated, DSEAR requires control measures to be applied in the following order:

- Reduce the quantity of hazardous substances to a minimum level.
- Avoid or minimise releases of hazardous substances.
- Control releases of hazardous substances at source.
- Prevent the formation of a dangerous atmosphere.
- Collect, contain and remove any releases to a safe place e.g. ventilation.
- Avoid ignition sources.
- Avoid adverse conditions e.g. temperature limits or control settings.
- Keep incompatible substances apart.

In the case where there are explosive atmospheres:

- All such areas where there are likely to be explosive atmospheres have been classified into zones in accordance with schedule 2 of the regulations.
- All areas that are classified into zones are appropriately protected from sources of ignition through the selection of equipment and protective systems compliant with the Equipment and Protected Systems Intended for Use in Potentially Explosive Atmospheres Regulations.
- Classified zones are suitably marked at all their entry points with an explosive hazard warning sign, no smoking signs and no mobile phones signs.
- Staff and students working in zoned areas must be wearing outer clothing that does not create a risk of electrostatic discharge.

7. DSEAR zone area classification

Workplace areas such as laboratories/workshops or storage areas which contain DSEAR substances are classified into zones. These zones are based on an assessment of the frequency of the occurrence and duration of an explosive gas atmosphere. The zones are designated as follows:

Zone 0	An area in which an explosive gas atmosphere is present continuously or for long periods.
Zone 1	An area in which an explosive gas atmosphere is likely to occur in normal operation.
Zone 2	An area in which an explosive gas atmosphere is not likely to occur in normal operation and, if it occurs, will only exist for a short time.

Various sources have tried to place time limits on to these zones, but none have been officially adopted. The most common values used are:

Zone 0	Explosive atmosphere for more than 1000 hours/year
Zone 1	Explosive atmosphere for more than 10, but less than 1000 hours/year
Zone 2	Explosive atmosphere for less than 10 hours/year but still sufficiently likely as to require controls over ignition sources

8. Boiling points and flash points

Flash point - The lowest temperature at which a flammable material gives off sufficient vapour to ignite in air, given an ignition source.

Boiling point - The temperature at which the vapour pressure of a liquid equals the pressure surrounding the liquid and the liquid changes into vapour. The boiling point decreases as surrounding pressure decreases.

Below is an example of some substances which give off flammable vapour which, when mixed with air, can ignite or explode.

Liquids such as:

- Petrol
- Diesel

And solvents in industrial products such as:

- Paints
- Inks
- Adhesives
- Cleaning fluids

The ease in which liquids give off flammable vapours is linked to their flashpoint which allows them to be classified according to the fire hazard they represent in normal use.

Flammable liquids are classified as:

Extremely Flammable

- Liquids which have a flashpoint lower than 0°C and a boiling point lower than or equal to 35°C.

Highly Flammable

- Liquids which have a flashpoint below 21°C but which are not extremely flammable.

Flammable

- Liquids which have a flashpoint equal to or greater than 21°C and less than or equal to 55°C and which support combustion when tested in the prescribed manner at 55°C.

9. Storage of Hazardous Substances which fall within the DSEAR regs

Safe storage of DSEAR hazardous substances is extremely important and should follow the guidance below:

- **Segregation** - segregate incompatible chemicals from each other.
- **Separation** - separate hazardous chemicals from unsuitable conditions for reasons of their flammability or reactivity e.g. preventing exposure to unsuitable temperature, air, moisture, sources of ignition, sunlight etc.
- **Ventilation** - provide ventilation which will remove flammable vapours.

9.1. Safe storage

Labelling

All containers should be labelled clearly with the following information:

- Name of substance
- Hazard category (flammable, corrosive etc.)

Compatibility

Incompatible substances must be stored separately. Poor or incorrect chemical storage practices can lead to inadvertent reactions between incompatible materials with the potential to cause harm, fire or even explosions. All chemicals should be stored in such a manner as to prevent incompatible materials from being accidentally mixed together in the event of the breakage of one or more containers in the storage area, or to prevent the formation and build-up of reactive vapours.

The correct storage of chemicals within storage areas/stock rooms, workshops and laboratories is an on-going problem which can sometimes be complex and potentially confusing. The overall purpose of correct storage is to maintain control over the chemicals so that they can be both stored and retrieved safely.

Quantities

It is important to keep stock levels of DSEAR hazardous substances to a minimum level that is reasonable for the level of usage in laboratories/workshops.

Larger amounts, especially flammable liquids, should be kept in external storage units and only brought into the main campus building in smaller, more manageable volumes.

Chemicals stored at the bench or other work areas should be those that are used frequently and quantities should be limited to the minimum that is convenient.

Good Housekeeping

This is essential in all laboratory/workshop areas but also very important in storage rooms/cupboards/shelving units. These should be kept clear and tidy and not be cluttered. Breakages and spillages are far more likely if storage arrangements are cramped, overcrowded or there is limited visibility.

Stock Control

Regular reviews of what DSEAR substances are being stored should be carried out and older, out-of-date and unwanted chemicals should be disposed of. Attention should be paid to expiry dates and the date a bottle was first opened. Some materials will deteriorate or decompose on extended storage.

9.2. Storage facilities

For description on safe storage of hazardous substances please see the [Hazardous Substances Policy \(Safe Purchase, Storage and Disposal\)](#)

Storage facilities need to serve several functions:

- Strong enough to carry the weight of the stored material.
- They must be compatible with the materials stored.
- Must be easily cleanable.
- For flammable liquids/solvents the storage facilities must have suitable resistance to flame and heat and not distort or melt for a sufficient period of time.
- For storage of corrosives (acids and bases) the material must be compatible with, and resistant to, the corrosive nature of the stored material.

Flammable solvent cabinets

Flammable liquids should be stored in clearly labelled, flammable-liquid cabinets (flame-resistant metal cabinets) which are at least:

- Of 30 minutes fire resisting construction.
- Robust enough to withstand foreseeable accidental damage.
- Able to retain spillage equivalent to 110% of the contents of the largest container.
- Appropriately labelled to indicate contents and signed to indicate the nature of the hazard.
- Sited so as to ensure adequate separation of incompatibles, and away from sources of heat or ignition, as necessary, and away from hazardous areas and emergency escape routes.

The maximum volume of flammable liquid that should be stored in such a flame-resistant cabinet(s) in a laboratory or workshop is 50 litres, regardless of the capacity of the storage cabinet(s).

Acid cabinets

Wooden cabinets provide excellent strength for storing corrosives. Their laminate finish offers a high level of chemical durability. Acids which fall within the DSEAR regulations such as Hydrochloric acid, which can corrode metal, should be stored in designated acid cabinets. In some laboratories/workshops older metal cabinets have been used for storing acids and over time these will start to show signs of corrosion. Wooden cabinets should not be used to store oxidising acids such as Nitric or Perchloric. These should be stored in Ventilated cabinets (see below).

Ventilated cabinets

These are cabinets which are fitted with forced ventilation. They may be sited under a fume cupboard and attached to its ducting system or they may be free standing.

10. Storage of compressed gas cylinders

- When not in use or empty compressed gas cylinders should be stored in an external storage unit away from the main campus building.
- The unit should be well-ventilated, weatherproof and be separate from any external units storing hazardous substances or waste chemicals.
- Compressed gas cylinders should be stored separately from combustible materials, ignition sources or intense heat.
- Cylinders must be secured in a vertical position to prevent them falling over. Chains are recommended in storage units, over clamp plus strap assemblies due to the fact that straps can melt or burn in a fire.
- Incompatible compressed gases should not be stored together – flammable gases (Hydrogen, Acetylene) should be stored separately from oxidising gases (Oxygen).
- Cylinders should be transported using cylinder trolleys designed for that purpose and must be secured so that they do not tip, fall or roll.
- Wear suitable safety shoes and other PPE, as identified by risk assessment, when handling gas cylinders.
- Cylinders should only be moved, connected and used by a competent person and necessary checks on the cylinders should be carried out during use.

11. Safe disposal of hazardous substances which fall within DSEAR

Hazardous waste, including chemical waste is subject to environmental regulations concerning disposal. The Hazardous Waste Regulations is an environmental legislation relating to the segregation, classification and consignment of hazardous waste which includes chemical waste. Hazardous waste must be disposed of appropriately and therefore each Schools/Services must consider the types of waste being produced and investigate the appropriate, safe routes of disposal.

Any hazardous substances which cannot be disposed of safely, and in an environmentally compliant manner, must be disposed of through a recognised licenced contractor.

MSDS (Material Safety Data Sheets) will have information on safe disposal routes for hazardous substances. But it is **important** to remember that the information on the MSDS is for the pure chemical/substance purchased. Any changes/modifications to the substance through the chemical process/laboratory work may render the waste product having different properties to the original substance and this needs to be taken into consideration. Any Risk or COSHH assessment relating to the lab activity and the chemical process for the hazardous substance should include disposal guidelines for waste substances produced and any by-products created.

Hazardous waste substances, which require disposal via a licenced contractor, can be stored on site whilst waiting to be uplifted. The same guidelines in place for the safe storage of hazardous substances (see section on Storage of Hazardous Substances) must be in place when considering the storage of waste chemicals.

These are as follows:

- **Segregation** – segregate incompatible waste chemicals from each other.
- **Separation** – separate hazardous waste chemicals from unsuitable conditions.
- **Ventilation** – to provide ventilation to remove malodorous, noxious, toxic or flammable vapours of waste hazardous substances.

Waste containers should be labelled clearly with the description of the waste product and any hazard associated with that substance and stored securely. It is common practice for empty chemical bottles/drums to be used for storing waste chemicals. This is permissible but the empty container should be clean and dry before being used for storing waste. Any previous labels should be covered over and the name of the waste product written clearly. Any old hazard labels, if not appropriate to the waste now being stored, should be covered over and new hazardous label stickers placed over the top (hazard label stickers can be purchased from most chemical supply companies).

If the laboratory/workshop is storing waste substances in a specialised cupboard/cabinet this should be clearly labelled. **Note** - incompatible hazardous waste substances cannot be stored together in the same cabinet/cupboard. Schools/Services which produce large volumes of hazardous waste substances may have an external storage unit specifically used for storing waste chemicals. Rules must also be in place in these units to ensure incompatible waste substances are kept segregated, separated and ventilation is in place to avoid any accidental mixing and potentially dangerous occurrences such as fire or explosion.

Waste substances should not be stored indefinitely and regular checks and audits of waste storage areas should be carried out. For Schools/Services producing large volumes of waste hazardous substances regular waste uplifts by licenced waste contractors should be done.

12. Hazardous substances database

Maintaining an inventory of chemicals stored at Edinburgh Napier University (either in laboratories, workshops, store cupboards or in outside storage units) is a requirement. Edinburgh Napier University has an electronic inventory management system (Hazardous Substances Database) in place. Nominated users can access the site and input in new chemicals on arrival, adjust any amounts of substances that have been used and remove any substance that is no longer onsite.

The hazardous substances database includes the following information:

- Name of the substance being stored.
- Amount of substance being stored.
- Location (Campus, room number, location in room).
- Hazardous properties of the substance.
- And finally the name of a contact person, normally the person in charge of the laboratory area (Senior Technician) or the end user of the substance.

On reception all new hazardous substances must be logged onto the database.

It is essential that should the substance be moved to another storage area within the University that this information be updated on the database. Any change in the amounts being stored, either through usage or through more of the substance being purchased, must also be updated in the database. The database should also be updated when a substance is no longer being stored within the University either from being used completely or disposed of. In these cases the substance(s) should be removed/deleted completely from the database.

You can get access to this database by contacting the Health and Safety Office healthsafetyoffice@napier.ac.uk

Note – Emergency Services

Should the emergency services require access, in the event of say a fire, to a laboratory or workshop they may be reluctant to enter the area because of doubt over what chemicals are present and how safely they are being stored. This can mean that valuable time is lost and a situation that would have been easy to deal with leads to major loss. The database can be accessed remotely and so the emergency services are able to ascertain which substances are in which location before they enter the premises. **With this in mind it is essential the database be kept up to date.**

13. Emergency procedures

All Schools/Services need to plan and practice to cope with foreseeable accidents, incidents or emergencies. This means :

- The right equipment to deal with the emergency (e.g. a spill), including protective equipment and decontamination products and procedures.
- The correct procedures to deal with a casualty, including having the Safety Data Sheets available should the person need to go to hospital.
- The right people trained to take action.
- The correct arrangements to deal with any waste created.

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14. Health surveillance

The University has an annual Health Surveillance check in place for employees who may be exposed to hazardous substances or whose work has a COSHH assessment that highlights the need for a health surveillance check.



Health surveillance is organised through the line manager who will contact Human Resources.




Hazardous chemicals which could come into contact with the skin or through inhaling minute particles through the air could pose a risk to a person's health if not properly controlled. In most cases exposure to trace quantities of toxic or irritant substances will cause harm only if exposure occurs sufficiently frequently. It is noted, however, that health surveillance may be appropriate even if very small or infrequent exposure to hazardous substances is known to pose a potent risk to health such as may occur with powerful respiratory sensitisers, recognised carcinogens or highly active biological agents or toxins.




The purpose of Health Surveillance is:


- To enable early identification and diagnosis of work-related conditions in individuals so that additional control measures can be put in place to prevent deterioration and promote recovery.
- To check whether general control measures in place to prevent work related health are adequate.
- To create an opportunity for training and education of employees regarding the risk of specific work-related conditions.

Appendix 1: Hazard substance labelling – GHS system

Pictogram	Definition	Usage
	<p>GHS01: Explosive Explosives—which is a solid or liquid chemical capable of a chemical reaction that causes damage to the surroundings Self-Reactive—heating may cause fire or explosion without the need for air Organic peroxides—again, heating may cause fire or explosion.</p>	<p>Unstable explosives Explosives, divisions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 Self-reactive substances and mixtures, types A, B Organic peroxides, types A, B</p>
	<p>GHS02: Flammable Flammables—which are gases, aerosols, liquids, or solids that will burn or ignite under certain conditions Self-Reactives—heating alone, without air, may cause fire or explosion Pyrophoric – in small amounts, may ignite within 5 minutes after contact with air Self-Heating—which may catch fire only in large amounts and after long periods of time when exposed to air Emitters of flammable gas Organic peroxides—which, when heated, may cause fire or explosion; may be sensitive to impact or friction; and may react dangerously with other chemicals.</p>	<p>Flammable gases, category 1 Flammable aerosols, categories 1,2 Flammable liquids, categories 1,2,3,4 Flammable solids, categories 1,2 Self-reactive substances and mixtures, types B,C,D,E,F Pyrophoric liquids, category 1 Pyrophoric solids, category 1 Combustible solids, category 3 Combustible liquids, category 3 Self-heating substances and mixtures, categories 1,2 Substances and mixtures, which in contact with water, emit flammable gases, categories 1,2,3 Organic peroxides, types B,C,D,E,F</p>

Pictogram	Definition	Usage
	<p>GHS03: Oxidising This symbol on a chemical label means that the substance is an oxidizer. Oxidizers may cause a fire by increasing the concentration of oxygen in the air.</p>	<p>Oxidising gases, category 1 Oxidising liquids, categories 1,2,3 Oxidising solids, categories 1,2,3</p>
	<p>GHS04: Compressed Gas This pictogram on a chemical label means that the substance is a compressed, liquefied, or dissolved gas under pressure at 29 pounds per square inch or more.</p>	<p>Compressed gases Liquefied gases Refrigerated liquefied gases Dissolved gases</p>
	<p>GHS05: Corrosive This pictogram on a chemical label means that the substance causes skin burns, eye damage, or destroys metals.</p>	<p>Corrosive to metals, category 1 Skin corrosion, categories 1A, 1B, 1C Serious eye damage, category 1</p>

Pictogram	Definition	Usage
	<p>GHS06: Toxic Acute toxicity means that exposure to a single dose of the chemical may be toxic or fatal if inhaled or swallowed, or if it comes into contact with the skin.</p>	<p>Acute toxicity (oral, dermal, inhalation), categories 1,2,3</p>
	<p>GHS07: Harmful Irritant–irritates the skin or eyes Skin sensitiser–which is an allergic response following skin contact Acute toxicity–which may be fatal or cause organ damage from a single short-term exposure Narcotic effects like drowsiness, lack of coordination, and dizziness Respiratory tract irritation</p>	<p>Acute toxicity (oral, dermal, inhalation), category 4 Skin irritation, categories 2, 3 Eye irritation, category 2A Skin sensitisation, category 1 Specific target organ toxicity following single exposure, category 3 Respiratory tract irritation Narcotic effects</p>
	<p>GHS08: Health hazard May cause cancer May cause respiratory irritation May damage fertility or cause harm to the unborn child May cause damage to bodily organs May cause genetic defects May be fatal if swallowed or if it enters the airways</p>	<p>Carcinogenicity, categories 1A, 1B, 2 Respiratory sensitisation, category 1 Germ cell mutagenicity, categories 1A, 1B, 2 Reproductive toxicity, categories 1A, 1B, 2 Specific target organ toxicity following single exposure, category 1,2 Specific target organ toxicity following repeated exposure, category 1,2 Aspiration hazard, categories 1,2</p>

Pictogram	Definition	Usage
	<p>GHS09: Environmental hazard Harmful to the environment</p>	<p>Acute hazards to the aquatic environment, categories 2,3 Chronic hazards to the aquatic environment, categories 1,2 Environmental toxicity, categories 1,2</p>

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